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Editorial

Information Management and Business Review (IMBR) provides a digital forum for researchers to share their knowledge and publish research work in the fields of information management, business, management and related disciplines. The work submitted for publication consideration in IMBR should address empirical and theoretical developments in the subjects related to the scope of the journal in particular and allied theories and practices in general. Author(s) should declare that work submitted to the journal is original, not under consideration for publication by another journal and that all listed authors approve its submission to IMBR. It is IMBR policy to welcome submissions for consideration, which are original, and not under consideration for publication by another journal at the same time. Author (s) can submit: Research Paper, Conceptual Paper, Case Studies and Book Review. The current issue of IMBR is comprises papers of scholars from different universities of Malaysia, Indonesia, China, England, Turkiye and Belgium. Social Media Influence on Quality of Life, Characteristics of Successful Asnafpreneurs, Gig Economy, Root Causes of Project Delay, Brand Equity and Purchase Intention, Innovation in Organizations and Human Resource Management, Livestreaming Commerce, Quality of Work Life and Employee Engagement, Promoting Psychological Well-Being, Organic Food Choices, Supply Chain Safety, Resilience & Technology Adoption, Determinants of Monetary Policy, Study of Convenience Stores, Repurchase Intention, Halal Purchasing Strategies, Coverage in Motor Insurance, Impact of Macroeconomics Factors on Carbon Emissions, Employees' Psychological Capital and Mental Well-Being, Government Expenditure & Economic Growth, Factors of Income Distribution, Work Stress and Work Environment, Social Embeddedness and Quality of Life, Knowledge Management Capacity, Technological-Organizational-Environmental Factors, Determinants of Bank's Liquidity, Employee Retention & Resilience, Role of Gender in Managing Finances, Cross-Cultural Adjustments, Psychological Contract Theory, Personal Bankruptcy Prediction, AI Revolution, Navigating Digital Banking, Influence of Technostress on Employee Well-Being, Hybrid Working and Employee Job Performance, Personalization Marketing & Consumer Purchase Intention, Culture and Sustainability, Impact of Social Media on Mental Health, Online Purchase Behavior, Tourism Experience Quality, Net Exports of Oil Palm Industry, Navigating Urban Mobility, Consumer Green Products, Public Perception Towards Insurance Companies, Perceived Enjoyment and Promotion Focus, Empowering Entrepreneurial Ecosystem, Impact of Visual Stimuli on Online Shopper's Emotion, Indeginous Tourism Industry, Public Transport Mobility, Health Communication Competence, Smart Organization Movement, Human Capital Investment Determinants, Navigating the Social Shift, Influence of Leadership Styles on Innovative Work Behavior, Islamic Microfinancing Initiatives, Job-Hopping Intentions, Government Health Expenditure, Determinants of Online Dating Application, Counterfeit Fashion Products, Stress Relief Applications, Workplace Mistreatment and Suicidal Ideation, Determinant of Family Takaful Adoption, Price of Crude Oil and Gold Price Volatility, Determinants of Inflation Rate Fluctuations, Information Technology Ethics and Netizenship behavior, Addressing Job Burnout, Effect of Artificial Intelligence (AI) on Students' Learning, Foreign Direct Investment and and Its Determinants, Sustainable Supply Chain Management, Customer Loyalty in Online Banking, University-Industrial Collaboration, Corporate Information Transparency, Open Market Share Repurchase Activity, Macroeconomic Forces Affecting Islamic Performance Indices, Women Homepreneurs on the TikTok, Enterprise Risk Management, Exploring E-Customer Satisfaction, Foreign Workers Remittances, Awareness of Sexual Transmitted Infections, Mindful Transportation, Adoption of Cashless Payment, Service Experience Equity on Repatronage Intention, Innovation and Renewable Energy, Boardroom Diversity and Whistleblowing Disclosure, Exploring Authentic Home-Cooked Recipes, Emotional Instability and Weight Fluctuations and Innovating Community Engagement are some of the major practices and concepts examined in these studies. All the submitted papers were first assessed by the journal committee and then the external editorial team for relevance and originality of the work and then blindly peer-reviewed by external reviewers depending on the subject matter of the paper. After the rigorous peer-review process, the submitted papers were selected based on originality, significance and clarity of the purpose. The special issue will therefore be a unique proposition, where scholars will be able to appreciate the latest results in their field of expertise and to acquire additional knowledge in other relevant fields.

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Social Media Influence on Factors Affecting Quality of Life among Breast Cancer Survivors: A Conceptual Study

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Abstract: Breast cancer disease remains a significant burden in global public health, affecting women with new cases and mortality. In 2018, Malaysian women of different races, like Malays, Chinese, and Indians, were diagnosed with breast cancer, approximately 17,000 in total. The consequence is that their quality of life was affected, especially in physical and emotional health. Nowadays, the use of social media among users is increasing, and in healthcare, it examines the role of social media in patient education and social support, which highlights the importance of modern digital technology. This conceptual study examines the factors affecting quality of life, moderated by the role of social media influence. Sociodemographic, psychological state, self-care behaviors, social support, and healthcare support systems were among the factors identified. The study relies on the integration of the quality-of-life model and social cognitive theory in conducting the literature review. Furthermore, this study has implications for improving the quality of life through social media, promoting patient-doctor engagement with social media, supporting policymakers in improving public health outcomes, and identifying potential future research topics. Theoretical contributions with integrated frameworks and an innovative approach to breast cancer survivorship were also identified. Policymakers and healthcare professionals have an opportunity to make practical contributions through the use of social media. The study's limitations were a narrow focus on cancer research, limited generalisability, and a broad range of social media investigations

Keywords: *Quality of life, social media, education, support, breast cancer*

1. Introduction and Background

Breast cancer is the most common type of cancer among women worldwide. Similar to the majority of developing countries, Malaysia is currently experiencing an epidemiologic transition in which lifestyle-related diseases, particularly cancer and cardiovascular disease, have become more prevalent (Ministry of Health Malaysia, 2021). Malaysia is also included in the list of countries that are affected by breast cancer (International Agency for Research on Cancer, 2022). A study from Malaysia on cancer survivors identified the top five cancers with high chances of 5-year relative survival rates namely thyroid at 82.3%, prostate at 73.0%, corpus uteri at 70.6%, breast at 66.8% and colon cancer at 56.8%. In the meantime, cancers of the lung, trachea and bronchus were found to be slow in survival time with 11.0%. Among ethnic populations, Chinese women (76.5%) have the highest 5-year relative survival rate for breast cancer, followed by Indians (70.5%) and Malays (57.9%) (National Cancer Registry Department, 2018a). The quality of life (QOL) of breast cancer survivors has emerged as a matter of concern. The quality of life for breast cancer survivors can be substantially influenced by the transition from patient to survivor. It is important to offer active support and assistance to help these individuals regain their previous lifestyles and improve their overall well-being (Park et al., 2021). Quality of life is associated with a variety of factors, such as sociodemographic, psychological factors, self-care behaviors, social support, and healthcare support. People perceive social media as a personal communication tool making it essential to protect the information shared on any platform. Women can utilize social media to facilitate the management of specific aspects of their self-care. On the other hand, this is frequently overlooked (Jain et al., 2021; Ure et al., 2020)

2. Literature Review

Quality of Life in Breast Cancer

Quality of life establishes a foundation for the patient's health requirements, therapeutic objectives, and patient-centered treatment by taking into account the patient's feelings, attitudes, and opinions during the

decision-making process (Elegbede et al., 2019). Costa et al. (2017) Conducted a study on the quality of life of breast cancer survivors and discovered that patients with distant metastases have a lower functional capacity (mean = 75.3), a lower functional scale (mean = 57.0), lower global health (mean = 51.3), and a higher number of symptoms (mean = 37.0) compared to those without distant metastases (mean = 90.5). A previous study in Malaysia assessed a study related to quality of life using the QLQ-C-30 survey. It has resulted that Chinese individuals reported the highest overall health, followed by Malay and Indian. The survey also revealed that respondents gave positive feedback on the quality of life in terms of functionality but not on the symptom scale. Common symptoms included dyspnoea, constipation, diarrhea, vomiting, and discomfort (Ganesh et al., 2016a). Lua et al. (2020) conducted a more recent study on the quality of life of breast cancer survivors in a public hospital. Most of the participants reported a high quality of life in all dimensions, including global health status ($p = 0.261$), functional measures ($p = 0.926$), and symptom scales ($p = 0.477$).

The survival rates for breast cancer cases in Malaysia are unsatisfactory, due to the increasing number of new cases and deaths. In comparison, Australia (89.5%), China (83.2%), Hong Kong China (83.3%), Japan (89.4%), Korea (86.6%), New Zealand (87.6%), and Singapore (80.3%) achieved 5-year net survival rates that exceeded 80% from 2010 to 2014. In contrast, Malaysia (65.0), India (66.1), and Thailand (68.7) achieved survival rates that were less than 70% (OECD/WHO, 2020).

Factors Influencing Quality of Life

Breast cancer survivors encounter a multitude of obstacles in their pursuit of recovery and the preservation of a high quality of life (Cimprich et al., 2002). Many contributing factors lead to the challenges. One of the primary factors that can have a substantial impact on the quality of life of breast cancer survivors is their demographic profile, which encompasses age, marital status, education level, financial status, and occupation. While the number of survivors has slightly increased as a result of technological advancements in cancer treatments, the quality of life outcome for each patient varies based on the cancer stage, long-term disease-free survivorship, and first recurrence of the cancer (Chopra & Kamal, 2012; Costa et al., 2017). The quality-of-life scores of breast cancer survivors were found to be higher when they were elderly, Chinese, single/divorced/widowed, and had permanent employment, according to a study conducted in Malaysia. Conversely, a comparable investigation conducted in Vietnam discovered that breast cancer patients who were younger, married, had a moderate income, and had concluded at least six months of treatment had a superior quality of life. These results indicate that the quality of life of breast cancer survivors in various countries may be influenced by cultural and socioeconomic factors (Ganesh et al., 2016a; Tran et al., 2019).

Fear is another psychological factor that influences the quality of existence. There are numerous varieties of fears that may arise, and this is the point at which patients may experience emotional and physical challenges. Previous research has indicated that certain women are apprehensive about mastectomy and surgery, which can negatively impact their body image and create the impression that their companions will abandon them (Brinton et al., 2014; Koboto et al., 2020). Additional instances of fear have been documented, such as the dread of a cancer diagnosis and the fear of the proposed treatment. Depending on the patient's condition, this may involve the decision to undergo a lumpectomy, axillary dissection, or other related procedures. One of the reasons for patient delays to the hospital and reduced effort to perform BSE, CBE, or mammograms is the fear of discovering a tumor. Consequently, they may maintain a denial regarding their connection to cancer. To maintain the patient's psychological well-being, they must be assisted in comprehending the recovery process, which may require a longer time to enhance their quality of life (Paraskevi, 2012; Salem & Daher-Nashif, 2020). Additionally, the dread of breast cancer has influenced the decision of women to forgo early screening, as the disease is commonly perceived as a cause of death, as per Kissal et al. (2018) and Lexshimi et al. (2014). Moreover, the patient's low self-esteem is a result of their dread of social stigma, which can delay screening and affect their psychological well-being and quality of life.

Next, these cancer patients must acquire knowledge in health literacy, as they must be informed about the cancer that has affected them. A survey was conducted in Turkey to evaluate the level of knowledge of gynecological cancer patients regarding cancer prevention. It was found that the majority of respondents (87.9%) concurred that early screening can save lives, that 57.3% comprehend that being obese increases their likelihood of developing cancer and that over 50% were unaware of the symptoms of gynecological cancer, which include bleeding between two menstrual periods. A higher quality of life was observed among

respondents who scored high on cancer knowledge, as indicated by an additional study (Adamowicz et al., 2020; Evcili & Bekar, 2020). In another instance from Malaysia, it was asserted that breast cancer awareness is inadequate, despite the existence of a variety of media platforms that are employed to enhance knowledge, including technological platforms like WhatsApp and smartphone applications (Nasution et al., 2021). There is still room to enhance the awareness of breast cancer and its knowledge among local women, as there are numerous clinical presentations and risk factors (Lee et al., 2019).

In addition to possessing knowledge about breast cancer, weight should also be considered a factor in self-care behavior. Another risk factor for the development of breast cancer is obesity (Gnagnarella et al., 2016; Lajtman, 2020; Lee et al., 2019). Numerous prior investigations investigating the relationship between obesity and cancer patients have determined that individuals who are obese or overweight are less inclined to pursue early cancer detection screening and maintain a healthy lifestyle. This is because prior research has demonstrated that the density of women's breasts decreases as their adipose tissue content increases, thereby simplifying the process of detecting cancer (Lee et al., 2019). A study in Slovakia examined the relationship between quality of life and obesity among endometrial cancer survivors. The findings showed that patients with level III obesity had a low level of quality of life compared to those with normal weight. This encompassed physical, emotional and social functioning. In the interim, they endure dyspnoea, fatigue, and pain, which are prevalent among obese cancer patients (Lajtman, 2020).

Social support is the fourth factor that influences quality of life. It can be interpreted as a cognitive evaluation of the sense of connection to others and the knowledge that assistance is available in the event of a need. This support can be provided by both informal networks of friends and family and formal networks of health care or social work practitioners (Shen et al., 2020). A robust bond of support has been identified between patients and their families and acquaintances in previous research. The investigation did indicate that the relationship is strong regardless of the presence of the disease. Consequently, it is advised that patients enhance their relationships with their family and acquaintances to enhance their quality of life (Lewandowska et al., 2020; Zhang et al., 2020). Additionally, the same results were identified with the assistance of the group's intervention. Group support roles have been shown to improve the patient's quality of life by offering them additional information, appropriate knowledge from medical doctors and nurses, and support from friends. The investigation also demonstrated substantial modifications that were implemented before and following the intervention, which significantly improved their quality of life (Dominic et al., 2018; Smith et al., 2018).

Many empirical studies have demonstrated that healthcare support, which is listed as the fifth factor, in addition to family and acquaintances, contributes to the development of positive social support. By utilizing technological platforms such as WeChat or other social media, healthcare professionals and patients can enhance patient interaction and, as a result, increase medical adherence. This is because certain patients may struggle to communicate in person but may thrive when utilizing this medium through messaging. The presence of healthcare professionals can enhance the level of knowledge among patients, thereby facilitating a more comprehensive comprehension of the disease (Benjamin, 2020; Wu et al., 2020). Additionally, numerous studies asserted that a positive relationship between a patient and a physician can result in increased treatment effectiveness, reduced recovery times, and enhanced physical and mental health. The patients' perceptions of their healthcare were also influenced by their interactions with healthcare professionals. These advantages are primarily associated with the quality of life of patients (Lubasch et al., 2022).

How Social Media Help

Social media has the opportunity to alter health behaviors, thereby enhancing the quality of life for its consumers. For instance, a prior study conducted in the United States that examined the use of the Internet for health-related purposes among adults revealed that 80% of them utilized the Internet to locate information. Nevertheless, only 20% of respondents reported utilizing social media to access health-related information. The same is true in Malaysia, where the general public prefers to consult with doctors rather than pursue health information (Calixte et al., 2020; Dawood et al., 2017). However, prior research has shown that social media can have a positive impact on the changes in the health-related behavior of users. For example, a study conducted in Turkey to gather perspectives from cancer patients regarding COVID-19 revealed that the media used to obtain information is primarily television (91.9%) and social media (43.8%) (Guven et al., 2020; Korda & Itani, 2013).

In particular, social media is crucial for sharing online health education with all people, including those affected by cancers, as a result of its extensive resources and beneficial content. For example, the majority of Twitter users agreed with the concept of creating a welcoming forum for education and support, and their understanding of breast cancer significantly increased. Besides disseminating valuable information, social media platforms can also distribute immediate results to the community at a quicker pace than traditional methods. Consequently, it encourages users to spend more time on social media, and a higher quality of life can be accomplished by fully utilizing it as an educational platform (Attai et al., 2015; M.-K. Smith & Denali, 2014). The majority of respondents in a previous survey regarding the efficacy of social media as an educational tool concurred that it can be effective. They identified Facebook, Pinterest, and Instagram as the most frequently used platforms for education (Pizzuti et al., 2020). Even though users in Malaysia demonstrated a satisfactory level of social media usage, particularly on Facebook, there is a dearth of prior research that has examined the potential of social media to enhance factors affecting the quality of life for breast cancer patients (Malaysian Communications and Multimedia Commission, 2018; Tobi et al., 2017).

Online support is highly significant in addition to the pursuit of online patient education. Some patients reported that face-to-face support was either unavailable or ineffective in satisfying their requirements (Mikal et al., 2019). In the past, breast cancer survivors who participated in semi-structured interviews regarding the use of online mediums to care for themselves and seek support expressed their reluctance to disturb nurses, as they were busy with clinical routines. Rather, they utilized it to solicit the guidance of other cancer survivors. Other than that, they can obtain a speedier response by participating in virtual communities on social media. Not only can they feel empowered, but they can also supplement additional social support without having to rely solely on healthcare providers by utilizing online social media (Ure et al., 2020). Through the virtual presentation of embraces, expressions of warmth, and the delivery of strong comments, emotional support was demonstrated (Harkin, 2017).

The factors that influence quality of life underscore the importance of social media. The sociodemographic profile which encompassed age, educational background, various occupations, and income, was used to demonstrate their willingness to become one of the respondents for treatment of HR+/HER2 preferences and strategy to seek health information. This is attributable to the women's robust self-efficacy in utilizing and gaining knowledge from social media to enhance their quality of life (Calixte et al., 2020; Stellato et al., 2021).

Psychological issues, including foreboding and seeking support from other cancer users, can also be discussed by cancer patients on social media. Informational, emotional, general guidance and resource support are among the recognized forms of assistance that are accepted. The vast majority of cancer patients employ social media platforms to articulate their anxiety regarding the disease, as indicated by prior research. Posting and hashtags are employed to disseminate information (Bergerot et al., 2020; Cho et al., 2018; Lee et al., 2020; Mikal et al., 2019).

Additionally, the utilization of this virtual social media has the advantage of enhancing self-care behaviors in terms of weight management and knowledge. The virtual medium can be used to enhance the knowledge of users in the knowledge domain through e-health learning. A Facebook program for adolescents with cancer was the subject of a prior study conducted in Korea. This mixed-method study determined that the intervention program is usable and that users can become more familiar with the program's navigation, improve their knowledge of the program, reduce costs for developers, and improve intervention program management through social media by utilizing Facebook (Park et al., 2020; Smith & Denali, 2014). According to certain research, the majority of breast cancer patients are obese. (Gnagnarella et al., 2016; Pakiz et al., 2016; Smith et al., 2018). The role of social media in helping them lose weight through a weight-loss program is implemented. Previous research has shown that social media can help patients become more engaged, track their progress within groups, and be a cost-effective tool for improving their health and quality of life (Hopkinson et al., 2020; Lozano-Chacon et al., 2021; Rumbo-Rodríguez et al., 2020).

In addition to self-care behaviors, the function of social media can be evaluated in terms of its potential to enhance the patient's online support. A study was conducted in support of National Cancer Survivors Day 2018 to examine what survivors shared on content on Twitter and Instagram. It was found that breast cancer survivors were more active on social media (16%) than other types of cancer survivors like prostate and

ovarian both with 3%, colorectal 2%, cervical and lung cancer both with 1% and the rest like oesophageal and eye both have 0.5%. Moreover, about 74% of image content shared by Instagram, followed by textual content on Twitter at 56% and video content on Instagram at only 9%. On the support system, the support group (11%) made the most significant contribution to information exchange, followed by family and friends (6%) and medical doctors and nurses (6%). (2%). This support has several positive effects, such as the fact that they have individuals who can assist during challenging periods, the enhancement of their self-efficacy through the bonding process, and the positive motivation that is derived from the comprehension of family and friends (Cherian et al., 2020). In three consecutive years, from 2011 (28,275 tweets) to 2014, online participation, such as on Twitter with the hashtag #BREAST CANCER, exhibited a positive trend, as concurred upon by Attai et al. (2015). Although previous research has been conducted on the use of social media to communicate with cancer patients (Mikal et al., 2020; Oh et al., 2020; Shen et al., 2020; Williams et al., 2018) and how social media enhances one's quality of life (Afsar, 2013; Basirat et al., 2020; Makady et al., 2018), there is a lack of research on the most effective use of social media to guide users, including patients, carers, and physicians (Han et al., 2018; Stellefson et al., 2020). In Malaysia, even though users showed satisfactory usage of social media, especially on Facebook, there was a lack of past research investigating how social media can improve the quality of life among breast cancer patients (Malaysian Communications and Multimedia Commission, 2018; Tobi et al., 2017), and few past studies discussed the role of social media as a mediator between factors affecting quality of life, especially among Malaysian breast cancer survivors.

Underpinning Theory: Quality of Life Model

Breast cancer cases have been responsible for a high prevalence in women worldwide for over a decade. Women who are diagnosed with breast cancer may find it difficult to carry out their daily responsibilities, such as working and spending leisure time with family and friends. Breast cancer is one of the chronic diseases in which patients must wait longer for treatment to be completed; thus, the adverse effects and radiation exposure they receive may have an impact on their overall quality of life. As a result, improving quality of life became the primary goal for the majority of cancer patients in the cancer and survivorship studies (Lavdaniti, dan Tsitsis, 2015; Mokhatri-Hesari & Montazeri, 2020) Even though the number of survivors has increased slightly due to technological advancements in cancer treatments, the quality of life outcome for each patient differed due to cancer stage, long-term disease-free survivorship, and first recurrence of cancer (Chopra & Kamal, 2012; Costa et al., 2017).

Since the concept of quality of life first emerged in the 1920s, there has been no specific way to define quality of life. Those existing definitions are always derived from the impact of patients' health status on their normal routine (Lavdaniti, dan Tsitsis, 2015). In general, quality of life has been defined as a subjective measurement or indicator of the health status of cancer survivors (Firouzbakht et al., 2020). The World Health Organization (2019) provided another well-known concept for quality of life. It is concerned with the perception of individuals of their position in life in terms of the culture and value system they lived in and about their goals, expectations, standards, and concerns. This can be explained by a cancer patient's journey of recovery, which includes emotional exhaustion, pain, frequent follow-up appointments, loss of appetite, nausea, breathing difficulty, and other related factors such as changes in body image and low self-confidence. This multifaceted concept of quality of life was related to their personal goals, expectations, standard norms, and concerns. All the patient's side effects had a significant impact on his or her quality of life.

The WHO Quality of Life was developed by expert teams from various countries to be applicable in any part of the world, and it is available in nearly 40 languages. This 26-item questionnaire included a 5-point Likert scale for each of the tested domains. The reliability and validity checks were also successful. The overall concept of quality of life is well-defined, with excellent proposals (Bakas et al., 2012; Huang et al., 2017; Theofilou, 2013).
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Table 1: Quality of Life Model by the World Health Organization

Domain	Facets incorporated within domains
Physical Health	Activities of daily living
	Dependence on medical substances and medical aids
	Energy and fatigue
	Mobility
	Pain and discomfort
	Sleep and rest
	Work capacity
Psychological	Bodily image and appearance
	Negative feelings
	Positive feelings
	Self-esteem
	Spirituality/religion/personal belief
	Thinking, learning, memory, and concentration
Social Relationships	Personal relationships
	Social support
	Sexual activity
Environment	Financial resources
	Freedom, physical safety, and security
	Health and social care; accessibility and quality
	Home environment
	Opportunities for acquiring new information and skills
	Participation in and opportunities for recreation/leisure activities
	Physical environment (pollution/noise/traffic/climate)
	Transport

(World Health Organization, 1996)

Previous research has revealed how some factors relating to cancer patients positively or negatively impact their quality of life, which serves as the foundation for the quality of life model fit into this study. The study, which was conducted in Malaysia, sought quality of life among 223 breast cancer patients from oncology clinics, wards, and a daycare center in a public hospital. It was discovered that sociodemographic factors such as older age (55 years old and above) (mean score = 66.7), Chinese patients (mean score = 67.8), marital status of single, divorced, or widowed (mean score = 66.7), and having permanent better employment (mean score = 72.6) resulted in a higher quality of life score in comparison to other groups. (Ganesh et al., 2016b). The same study was also conducted among Vietnamese breast cancer patients in 2019. However, some differences in results were observed from the same type of study. This study was conducted in Vietnam, and it looked at the quality of life of Vietnamese breast cancer patients. It was discovered that being younger (mean score = 55.0), married (mean score = 55.2), having a moderate income (mean score = 55.7), and having completed at least 6 months of treatment (mean score = 55.6) were all associated with good quality of life (Tran et al., 2019).

Fear is the second factor that falls under the psychological state that affects the woman's quality of life. Several types of fears are involved, and this is where it may challenge the patient both physically and emotionally. According to previous research, some women are afraid of surgery and mastectomy, which can hurt their body image and give them the impression that their partners will leave them (Brinton et al., 2014; Koboto et al., 2020). Another type of fear also has been reported including the fear of cancer diagnosis and the planned treatments, including lumpectomy, axillary dissection, or other related surgeries based on the patient's condition. Fear of finding a lump also can become one of the reasons why the patient delays seeking help, other than less effort on performing BSE, CBE or mammogram. As a result, they may live in denial about their association with cancer. To keep the patient's psychological state in good shape, they must be helped to understand the recovery process, which may take longer than expected to improve their quality of life (Paraskevi, 2012; Salem & Daher-Nashif, 2020). Furthermore, women's fear of breast cancer has influenced their decision to forego early screening because the disease has a common perception of death. Furthermore,

the patient's fear of social stigma leads to low self-esteem, which delays screening and has an impact on their psychological well-being and quality of life (Kissal et al., 2018; Lexshimi et al., 2014).

Next, learning knowledge in health literacy is important because these cancer patients must notice and be aware of information about the cancer that has attacked them. For example, in Turkey, a survey was implemented among gynecological cancer patients to assess their level of knowledge about cancer prevention. It was found out 87.9% of the majority of respondents agreed that early screening can save lives, 57.3% understand that being obese increases their chances of getting cancer, and more than 50% did not know about the signs of gynecological cancer, which is bleeding between two menstrual periods. According to another study, respondents who scored high on cancer knowledge had a higher quality of life (Adamowicz et al., 2020; Evcili & Bekar, 2020).

However, the knowledge level among cancer patients was not always comparable to the outcome of healthy living among them. Obesity is another risk factor for developing breast cancer (Gnagnarella et al., 2016; Lajtman, 2020; Lee et al., 2019). Several previous studies on obese and cancer patients concluded that obese or overweight people are less likely to follow a healthy lifestyle and are less likely to seek early cancer screening. This is because previous research found that the fattier tissue women have, the less dense their breasts are, making cancer detection easier (Lee et al., 2019). A previous study in Slovakia among endometrial cancer survivors investigated the relationship between obese cancer patients and quality of life. The finding revealed class III obese cancer patients had the lowest quality of life as compared to normal weight. Physical, emotional, and social functioning are all included. Meanwhile, they experience pain, fatigue, and dyspnoea, which is common in obese cancer patients (Lajtman, 2020).

Another factor that affects quality of life is social support. It can be interpreted as a cognitive appraisal of being connected to others and knowing that help is available if needed, which can be provided by both informal networks of friends and families and formal networks of health care or social work practitioners. (Shen et al., 2020). Previous research has found a strong bond of support between patients and their families and friends. They did mention in the investigation that the relationship is good whether with or without the disease, and thus it is recommended to improve the relationship between patients and their family and friends to achieve a better quality of life (Lewandowska et al., 2020; Zhang et al., 2020). Furthermore, the same findings were discovered with intervention support from the group. It has been demonstrated that group support roles improve the quality of life among patients by sharing more information, receiving proper education from healthcare professionals, and receiving motivation from peers. The study also revealed significant changes made from pre- to post-intervention and how it greatly aided them in terms of quality of life (Dominic et al., 2018; Smith et al., 2018).

Many previous publications acknowledged good social support is not only found among the nearest circle like family and friends but also in a healthy environment. The relationship between patients and doctors or nurses can improve interaction and thus medical adherence among patients is good by using technological mediums such as WeChat or other social media. This is because some patients may not be able to communicate well in person but may do well when using this medium through texting. Having healthcare professionals on hand raises the level of knowledge among patients, which can lead to a better understanding of the disease (Benjamin, 2020; Wu et al., 2020).

Furthermore, the influence of social networking can lead to the possibility of changing health behavior, thereby improving the quality of life for its users. This also contributes to preventing patient delays because when healthcare professionals agree to share health education online, the possibility of patient delays is reduced. After all, information is shared without delay. In the United States, for example, a previous study that investigated health-related Internet use among adults revealed that 80% relied on the Internet to find information. However, only 20% reported using social media for health-related information. The same is true in Malaysia, where the general public prefers to consult with doctors rather than seek health information. (Calixte et al., 2020; Dawood et al., 2017). Nonetheless, previous research indicates that social media can positively influence users' health-related behavior change; for instance, a study in Turkey was done to seek perspectives among cancer patients on COVID-19, and it highlighted that seeking information is dominated by media such as television (91.9%) and social media (43.8%), respectively (Guven et al., 2020; Korda & Itani, 2013).

In addition, this was proved based on the sociodemographic profile of social media users, consisting of age, education, occupation, and monthly income to participate in the study of treatment HR+/HER2 preferences and the seeking of health information online. This is due to the women's strong self-efficacy in engaging in and learning from social media to improve their quality of life (Calixte et al., 2020; Stellato et al., 2021).

Furthermore, the increased use of social media can undoubtedly improve e-health learning among users to improve knowledge. A previous study in Korea looked into a Facebook intervention program for children with cancer. This mixed methods study found that the intervention program is usable and that by using Facebook, users could become more familiar with the program's navigation, improve knowledge from this program, reduce costs for developers, and researchers can improve intervention program management through social media (Park et al., 2020; Smith & Denali, 2014).

Body weight management via social media and mobile applications can also be viewed as motivating users to make an effort for improved quality of life. Through this medium, they can share their journey to a healthy lifestyle and make people aware of the food choices they can make other than setting goals, such as calorie counting, portion control, and the ability to read and understand nutritional labels. Aside from that, it can help to create a social support environment within the Facebook group to do healthy diet and fitness challenges posted by fitness coaches, such as the challenge of not eating candies for 2 weeks, using stairs to burn some calories, and recording calorie intake and sharing it on the group (Ghelani et al., 2020; Godino et al., 2016).

Last but not least, consider how the use of social media can help patients with online support. In conjunction with National Cancer Survivors Day 2018, a study was conducted to investigate the content shared by survivors on Twitter and Instagram. It was discovered that 16% of breast cancer survivors engaged actively on social media compared to other types of cancer survivors such as prostate (3%), colorectal (2%), lung (1%), cervical (1%), ovarian (3%), kidney, oesophageal, and eye, each of which is 0.5%. Instagram showed the highest rate for image content (74%) and video content with 9%. This result was followed by Twitter with textual content of 56%. On the support system, the support group (11%) contributed the most to information sharing, followed by family and friends (6%) and healthcare professionals (6%). (2%). Some of the positive outcomes of this support include the fact that they have people who can support them during difficult times, that the bonding created improves their self-efficacy, and that the understanding shown by family and friends brings positive motivation (Cherian et al., 2020). This is agreed by Attai et al. (2015) Online participation, such as Twitter with the hashtag #BREAST CANCER, demonstrated a positive trend in three consecutive years, from 2011 (28,275 tweets) to 2014 (85, 972 tweets).

Social Cognitive Theory

Albert Bandura's Social Cognitive Theory (SCT) is an interpersonal behavior theory that employs the concept of reciprocal determinism to explain how personal factors such as beliefs and attitudes, as well as environmental and behavioral factors, interact with one another. That does not imply that reciprocal causation contributed equally because one factor may have a greater influence than others at times (Bandura, 1989). In other words, SCT is a term used to describe how people learn behavior by observing others.

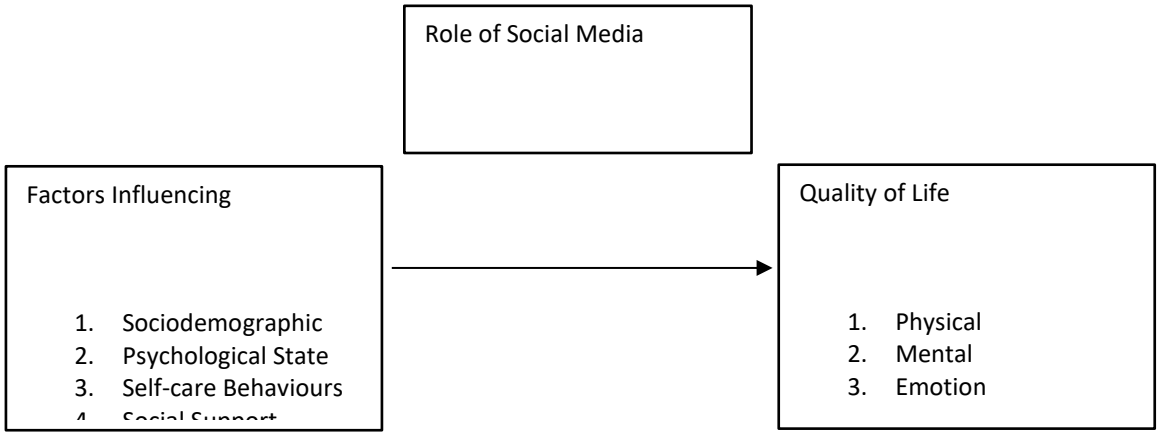
This theory was proposed for this study because it provides an understanding of how social media influences people's behavior to act in a certain way. By sending communication in two different ways, social media leads to behavioral change. The first involves guiding users to cope with new behavioral actions by informing, sharing, and motivating them to act with them; the second involves users adopting, supporting, and sharing the behaviors they adopted with others. This social media role has evolved into an environmental factor that influences both the user's personal beliefs and attitudes toward receiving health education and support, as well as shaping the behavioral outcome through observational learning (Li & Liu, 2020). Through observational learning, SCT is said to emphasize peer influences and social norms for behavioral outcomes(Healy & Marchand, 2020). The healthcare domains have expanded their investigation into the use of SCT in social media, particularly behavior analysis. A portion of them was to investigate the causes of online engagement, health promotion, and disease prevention (Bashir, 2020; Yoon & Tourassi, 2014). SCT has been used to study behavior in non-healthcare areas, with a particular focus on Chinese social media discontinuance. SCT is a suitable tool for examining online behavior on social media (Gan et al., 2024).

Previous research demonstrated how this theory aided social media or application influence for behavioral change for better health status. The use of the MapMyFitness mobile application and Facebook by breast cancer survivors in preventing recurrence has shown self-regulation in improving their quality of life by performing physical activities. It is also discovered that this technologically-based medium provides survivors with health education and support for them to care for themselves(Pope et al., 2019). Nevertheless, the majority of previous research on using SCT has focused on Western countries, leaving a significant knowledge gap about the topic in the Malaysian context. Moreover, there is a lack of consistency in the advantages of social media across studies, making it difficult to generalize the findings. This review aims to bridge these gaps by implementing behavior analysis in social media among Malaysian breast cancer survivors. In addition to supporting the application of the theory in this investigation, this study can offer insightful results regarding the influence of social media on the quality of life of breast cancer survivors. Furthermore, the study might provide information regarding the various factors that contribute to the inconsistent use of social media. In simpler terms, the use of social media by users, particularly patients, may or may not be useful.

Proposed Conceptual Framework

In this study, we introduced a conceptual framework to ascertain the factors that influence quality of life in the context of breast cancer and the impact of social media. Our framework posits that the quality of life of Malaysian breast cancer survivors can be influenced by five factors: demographic profiles, healthcare professional support, self-care behavior, psychological state, and social support. Although the relationship between those determinants was investigated, social media has been instrumental in fostering a more positive relationship, which will lead to a higher quality of life for more survivors. Furthermore, the influence of social media in this context is associated with two functions: online support and patient education. The framework assists stakeholders in gaining a more comprehensive understanding of the interactions between factors that influence quality of life and the role of social media in supporting breast cancer survivors in the digital era.

Figure 1: Proposed Conceptual Framework



3. Research Methodology

To respond to designated research objectives, the researcher will use a quantitative research design. This study will use Malaysian breast cancer survivors' data from a non-profit organization's cancer registry to fill out the surveys. The purposive sampling method was applied to this study due to the inclusion and exclusion criteria listed. Inclusion criteria require applicants to be female, over 18 years old, breast cancer survivors, not currently hospitalized, have at least one social media account, be in stages I-IV of breast cancer, have completed conventional treatment, and have survived at least six months post-treatment. Exclusion criteria include being male, under 18, survivors of other cancers, currently hospitalized, lacking a social media account, not having completed conventional treatment, being critically ill, or being unable to participate in the survey. The population of breast cancer survivors in Malaysia as of 2018 is 17,009 (National Cancer Registry Department, 2018b). Green (1991) states that 97 samples can be collected to accommodate the six predictors with a medium-sized effect. This study will run the analysis using SPSS and Smart PLS version 4.

4. Relevant Implications

This study focuses on the important function of social media in moderating the factors that influence the quality of life among breast cancer survivors. The findings imply that social media platforms can be a very effective and promising strategy for improving quality of life in terms of physical, emotional, and mental health through online knowledge sharing and emotional support from the online community. Certain types of information are presented, such as general cancer information, treatment options, and coping strategies. They can also access videos and professional advice through the platform. Other survivors on social media share the same problems and experiences with cancer, and they may help each other to have a better quality of life. It can lead to a reduction in isolated feelings that are not comforting. Support is also provided through online support groups, where members can share stories, express their opinions, and get inspiring words. The study also supports the integration of the Quality-of-Life model and Social Cognitive Theory, which focus on complex patient relationships and the role of social media in examining health outcomes. It will assist in proposing future research and interventions.

Aside from that, two important stakeholders, healthcare providers, and policymakers, may collaborate to promote patient-centered care through the social media platform. Healthcare professionals may create personalized social media accounts connected to their patients. This is intended to increase patient involvement with their providers. Healthcare practitioners can offer instructional materials, reminders for patient visits, and beneficial suggestions for managing chronic diseases. Next, doctors may launch a live video to establish real-time interaction, allowing for a quicker response to the patient's questions. Meanwhile, policymakers can improve their policies by soliciting feedback from social media users, resulting in a better understanding of the current healthcare system's requirements and weaknesses. They can also use this platform for public health campaigns, particularly breast cancer interventions. Despite numerous health efforts, the number of cases remains high. Thus, integration with social media and new campaign ideas is required. The policy can help address the gap in healthcare access by improving accessibility to underserved people, such as those living in rural locations or having difficulty seeking treatment owing to inadequate transportation.

Integrating social media use into healthcare settings may lead to the finding of relevant research topics. The first is to investigate how social media can be used to manage psychological issues such as anxiety and fear. The study could focus on the efficacy of online group support or virtual counselling in reducing patients' anxiety and fear and improving their quality of life. It may help to identify any benefits and drawbacks to using social media in the study. Next, future research can look into how social media might help with weight management by monitoring online behaviors or implementing diet challenges. Studies on the impact of fitness levels among cancer survivors may also be worth investigating. Another interesting area for additional investigation is the role of social media. This research focused on online information and support. Thus, future researchers can explore the impact of these on quality of life. These future studies can provide valuable information on the complex interactions between factors affecting quality of life, which ultimately lead to more effective patient-centred strategies.

5. Conclusion

This conceptual study has revealed significant factors that affect the quality of life among breast cancer survivors. Demographic elements like age, marital status, education level, income, and job type play a significant role in impacting quality of life. Psychological factors can disrupt the quality of life by avoiding the willingness to seek treatment. Self-care behaviors, through knowledge and body weight, are critical aspects in leading to quality of life. Social support from family, friends, and group support is vital for enhancing survivors' emotional and social functioning. Healthcare professional support is also important to motivate the survivors to improve their quality of life through their beneficial advice. Healthcare professionals are also helpful in motivating survivors with health-related concerns. Social media has demonstrated a positive impact on these factors by educating patients and providing online support. Despite these benefits, there is a need for more research on the most effective ways to use social media in guiding relevant parties like patients and carers.
The proposed conceptual framework effectively integrates different factors that affect the quality of life for breast cancer survivors while emphasizing the role of social media in the relationship. It comprehensively

addresses sociodemographic, psychological state, self-care behaviors, social support, and healthcare support on quality of life in terms of physical, mental, and emotional. By leveraging social media for patient education and online support, this framework demonstrates how the platforms can improve understanding of chronic conditions, improve adherence to treatment plans, and provide emotional and psychological support. This comprehensive approach makes a reliable model for enhancing the quality of life among the survivors.

For theoretical contribution, lies in the integration of the Quality-of-Life Model and Social Cognitive Theory in proving a holistic understanding of the factors affecting quality of life, moderated by social media. The Quality of Life offers a structured approach to assess the multifaceted impact of breast cancer on survivors' lives, while the Social Cognitive Theory emphasizes the role of personal (factors affecting the quality of life) and environmental (social media) factors in managing this chronic condition. This dual-framework approach not only introduced the importance of quality of life from the physical and mental perspectives, but it also provided actionable ways for interventions aimed at improving survivors' outcomes. By integrating social media, this study demonstrates how it can enhance patient education, support, and engagement, ultimately leading to a better quality of life. This contributes a novel perspective that can improve future research in the field of health management.

Three practical implications were stated. The Ministry of Health can play an important role in investigating technological advancement. By using its official website, myHealth Portal and developing new social media mainly for cancer survivors, it shows the continuous support for these groups. Some of it is sharing accurate health information, success stories from various cancer survivors, healthy lifestyle tips and a few types of fun physical activities to perform. As more users rely on mobile technology to monitor health, these resources will become useful and valuable.

Ultimately, this investigation would be advantageous to both the general population of young women and the broader community. By expanding their range of alternatives, this investigation will serve to improve the quality of life for young women and the community. Next, healthcare professionals can use social media platforms to continuously deliver accurate and timely health information to patients. This technique is suitable for patient education and support while motivating them to be more concerned with their healthcare. What the professionals can share are important cancer information, cancer updates, and useful prevention care recommendations. Moreover, establishing online support groups can be a practical approach, especially with peers, while encouraging family and friends to join to improve on continuous emotional support and motivation. The combination of peers and family or friends in online support can create a good support system that addresses both the emotional and practical needs of the survivors, which will reduce isolation and sadness and improve quality of life.

The scope of future research for this study has been established. Future researchers can make significant contributions to the field of breast cancer survivorship by conducting several studies. This study can be improved by examining the effects of social media at various points throughout the survival years. Currently, survival rates are counted within one, three, and five years. As a result, future research can look into whether there has been any difference in how people use social media to improve their quality of life throughout the years. Furthermore, specific social media platforms can be analyzed to see the sort of content published and how it corresponds with the survivor's experiences using the platform. The findings will help establish whether a specific platform is the appropriate medium for breast cancer survivors. Finally, examines the efficiency of social media and other offline coping mechanisms about factors affecting survivors' quality of life. In this regard, the study could include cognitive behavioral therapy as an offline strategy for improving quality of life. It can then be compared to the use of social media to evaluate which coping method is most helpful in assisting the survivors. Nevertheless, there are limitations to address. As a conceptual study, this research does not present any empirical data to support the literature review claims. Further research is needed by conducting surveys to compile the data and test the hypotheses. Other than that, this study focused solely on breast cancer, limiting the generalisability of findings and results to other types of cancer. Finally, this research is not specifically focused on a particular social media platform, which may lead to differences in the study for every type of social media platform.

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The Study of Characteristics of Successful Asnafpreneurs in Southern Malaysia

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Abstract: The study explores a characteristic of successful asnafpreneurs to address the number of registered asnafpreneurs seeking aid more than the number of successful asnafpreneurs produced in Southern Malaysia. However, the current industry can still not completely produce an independent business owner based on the Asnaf title. The study aims to determine successful entrepreneurs' internal and external characteristics in Southern Malaysia. A quantitative method was used in this study. Respondents were chosen using the non-probability sampling method. SPSS software was used for data analysis. Descriptive analysis (frequency and percentage) and hypothesis testing (chi-square test, correlation, and regression) were utilized to solve the research topic. Study finds that internal factors and external factors play an important role in asnafpreneurs success. Chi-square Test analysis revealed that Pearson's significant value was at the 0.00 level. This indicates that it is less than 0.05 at this level. This test successfully rejects H0, which means there is no correlation between internal factors with a successful characteristic of asnafpreneur and there is no correlation between external factors with a successful characteristic of asnafpreneur. Other authors may study the other geography parts and new challenges for asnafpreneurs to succeed in the future.

Keywords: *Successful Business Person, Asnafpreneurs, Zakat, Quantitative, Technology, Agency Authorities*

1. Introduction

According to MAIWP (2022), there are eight different categories of asnaf: needy, poor, amil, mualaf, Al-niqab, Al-gharimin, Fisabilillah, and lastly, Ibnu Sabil. This study only covers the poor and needy category. Flood victims were not included in this study because they were categorized as asnaf al-Gharimin as zakat recipients (Siti Fariza, 2016). Asnaf and entrepreneur are combined to form the phrase asnafpreneur. Asnaf entrepreneurs, according to Zuriyati and Muhd Adnan (2018), are people who have gone through the process of starting a business, can fulfill their obligations, and are motivated to try their hand at trading with support and encouragement from zakat institutions in Southern Malaysia, particularly the impoverished and destitute. Zakat is said to be able to assist the Asnaf in developing prosperous Asnaf entrepreneurs. Islam has established some financial regulations to raise income for the benefit of Muslims. Therefore, by preventing asnaf entrepreneurs from becoming entangled inthe riba problem through loan assistance methods (cardhul al-Hasan), the capital aid from this zakat fund can prevent asnaf from remaining asnaf of zakat. One significant tool in the development of a poor Muslim community is Qard al-Hasan. Through several products and initiatives, including pawnbroking and sukuk, the Qard al-Hasan method was also incorporated into the Islamic financial system in Malaysia (Norajila, 2015).

Asnaf Muslim entrepreneurs are taught to run halal as well as ethical businesses to get the Almighty's blessing [mardhatillah] and to generate enough money to assist a large number of people. "O you who have believed, do not consume one another's wealth unjustly, but only [in lawful] business by mutual consent," says Surah An-Nisa 4:29. And don't murder yourself [or each other]. Indeed, Allah is eternally merciful to you". According to Amin (2022), this study focuses on a group of asnafs who are willing to engage in entrepreneurial activities to support their lifestyles without heavily relying on monthly zakat aid, which is static and fixed and may not considerably improve their quality of life. He did, however, employ the phrase asnaf Muslimpreneur as a synonym for asnafpreneur, although Abdul Halim et al. (2012) use Entrepreneurial Asnaf. The phrase asnafpreneur comes from the Federal Territory Islamic Religious Council's (MAIWP) Asnafpreneur Program, which was inspired by the name asnaf entrepreneur. With the arrival of the COVID-19 pandemic, the number of successful traders has also decreased (UNICEF, 2021).

Most Asnaf who do business on a small scale do not use technology and assistance from external parties to

develop their business. Nowadays, small businesses can also be simplified with the availability of current technology. In addition, asnafpreneurs lack confidence in themselves and cannot develop their business to a higher level. Thus, there are fewer and fewer businesses that will succeed among asnafpreneurs in Southern Malaysia. Except for the asnafpreneurs themselves, who will help the asnafpreneurs find this formula for success, who else would stand up for their fate? (Munahar et al., 2022). They are ready to change the fate of their lives but it is impossible to succeed without their strength and the right formula. Support from outside parties also plays an indispensable role for successful asnafpreneurs. It is the local academics' role too.

These days, an entrepreneur needs to be proficient in digital to succeed in marketing, business, and related fields. While comprehending contemporary technology such as smartphones, digital devices, and the internet is necessary, entrepreneurs also need to incorporate several auxiliary systems and programs into their business operations. For instance, to support entrepreneur-owned enterprises, research on Accounting Information Systems (AIS) has been done by Mu'is and Hamidah (2020). To compete in the digital economy, entrepreneurs needto be knowledgeable about and comfortable with digital technologies. Finding out how accepting they are of technology is essential, as it will indicate whether or not they are prepared to use it. Many frameworks and models have been developed to explain how users adopt new technology based on early research. Some models include additional elements that may affect user adoption, such as the Technology Adoption Model (TAM).

2. Literature Review

Previous Studies of Successful Characteristics of Asnafpreneur: The most obvious reasons why an entrepreneur fails to launch a successful business are (1) lack of capital, (2) improper education, (3) lack of or limited experience in business-related activities, and (4) personality that is far from that of a convincing entrepreneur, according to Afif Muhamat (2013) prior research. Most people agree that Lembaga Zakat Selangor (LZS) needs the research factors of (1) capital, (2) training, and (3) knowledge to help the zakat recipients establish profitable businesses that eventually lead to a greater standard of living. Only (1) capital and (3) an asnaf's expertise is significant in determining an asnaf's entrepreneurial success, according to regression research, with training being insignificant (Afif Muhamat et al., 2013). In addition to providing financing, Baitul Maal Wa Tamwil (BMT) in Indonesia also helps its asnafpreneurs by offering them access to infrastructure, training programs, and other resources (Wulandari and Kassim, 2016).

The outcome is also consistent with the research conducted by Abdul Halim et al. (2012), which found that effective asnafs are (1) willing to go above and beyond. (2) Take a risk to expand their company. They also (3) possess a certain amount of business imagination, (4) consistently believe that their company will succeed in the future, and (5) are proud of what they do. The following factors influence the success of asnaf entrepreneurship: (6) capital aid, (7) knowledge of entrepreneurship, (8) support, and (9) assistance from family members and partners. The most significant internal component is the application of Islamic teachings in daily life, such as (1) donating to charity, (2) praying all five times a day, and (3) having true intentions. Moreover, four attitudes and five business interests are internal determinants that influence their success (Abdul Halim et al., 2012). The Asnaf Muslimpreneur Success Index (AMSi) uses four main factors to quantify the success of Asnaf Muslimpreneurs. Among the elements of successful Asian Muslim entrepreneurs are (1) business experience, (2) business justice, (3) well-being, and (4) financial wisdom (Amin, 2022). A Few Features of Supporting Characteristics of Successful Asnafpreneur from Past Research.

Internal Factors (Thoughts and Feelings): Abdul Halim et al. (2012) examined the characteristics of prosperous asnaf enterprises and explored the prospects and remedies for zakat organizationsin Malaysia. Based on the 39 respondents randomly selected from successful entrepreneurial asnaf, the results indicated that these individuals have a particular degree of entrepreneurship orientation, are willing to take risks to grow their business, and have a unique marketing approach. They also take pride in their company's ownership, continually foresee its future, and demonstrate inventiveness in the commercial sector. The results also show that asnafs that are successful have more innovative products than average.

Afif Muhamat (2013) looked into an assessment of the Selangor Zakat Board's contribution to the success of the company's entrepreneurial asnaf. The focus is on the state because of the many success stories of

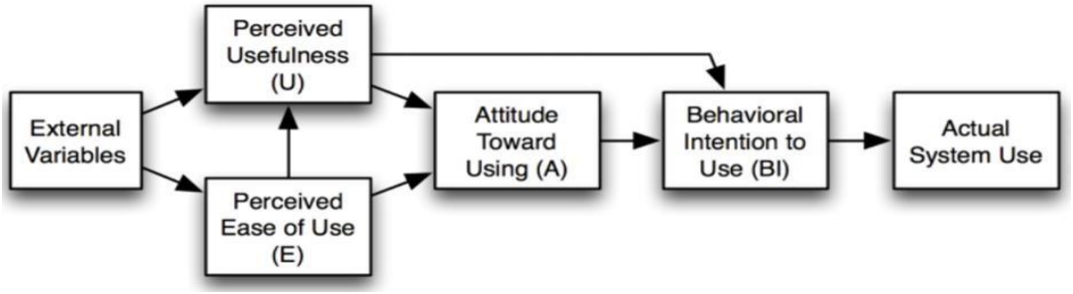
asnafpreneurs that are arranged by the organization that helps the asnafs escape abject poverty. This study suggests that an asnaf's ability to manage and oversee their organization in line with the previously established business strategy is influenced by their level of business expertise. Research indicates a connection between Asnafs's business success and their level of knowledge. Their results are consistent with previous studies conducted by Abd Rahman and Ahmad (2011), who argued that relevant knowledge and training play a critical role in determining the success of Asian Muslim entrepreneurs in the economic world.

According to a study by Naito and Washizu (2021), Japanese people tend to focus on, pick out, and remember good memories of significant events since they have a limited lifespan. Islam, which maintains that everyone should always keep death in mind and make an effort to behave in line with Islamic law, shares this belief. The asnaf characteristics have a big impact on an asnafpreneur's success. The following attributes are required of them: (1) a high level of initiative or effort; (2) a willingness to take significant risks; (3) sacrifice; creativity and imagination; (5) the capacity for problem-solving; (6) convictions and (7) self-assurance; (8) commitment and (9) earnestness; 10) honesty and (11) dependability (Fauziah Ibrahim et al., 2013).

External Factors (Technology): Utilizing science, technology, and innovation will be more important for a nation's development in an increasingly competitive global economy (Kementerian Sains, Teknologi Dan Inovasi, 2021). Because of this, companies in today's fast-paced business climate need to adjust to the rapid rate of technological advancement. These are obstacles that entrepreneurs need to go past to navigate the current economic environment. The information era, internet development, and globalization provide challenges for entrepreneurs competing in the market. Due to competition, businesses need to be innovative and creative to respond swiftly to changes in the market. It turns out that most companies today place a high value on staff creativity (De Jong and Hartog, 2010). This is done for the company to gain from its innovative work practices and improve performance as well as its ability to compete globally (Noorsafiza et al., 2013). The explanation claims that a successful asnafpreneur's firm depends heavily on technology adaptation. Respondents' perception levels were measured using the Technology Acceptance Theory (TAM) instrument developed by Davis & Davis (1989) and processed according to the suitability of the study by the researchers (Khadijah Muda et al., 2013).

Technology Acceptance Model (TAM)

Figure 1: Original Framework of Technology Acceptance Model



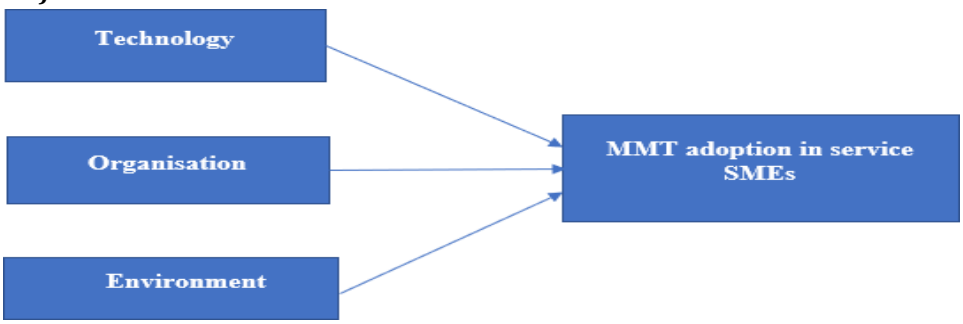
Source: Davis & Davis (1989)

The Technology Acceptance Model (TAM) (figure 1), created by Davis & Davis (1989), is one of the most widely used models to explain user acceptance behavior. The original TAM established the concepts of perceived usefulness (PU), perceived ease of use (PEOU), attitude, and behavioral intention to use. The two structures, PU and PEOU, generate views from end users about technology and forecast their attitude towards it, hence predicting its adoption. Though perceived usefulness refers to the conviction that the technology employed would enhance the performance of a specific work, perceived ease of use refers to the user's capacity to finish the task with minimal effort. This model could be able to explain why, if asnafpreneurs embrace the use of technology in their operations, the level of asnaf business will rise in the future. This is because technology facilities are being used more and more frequently these days. Data from (Ma and Liu, 2004) show that usefulness is critical for IT adoption and that end users' assessments of a system's usefulness are highly impacted by its ease of use.

According to Ibrahim et al. (2022), digital marketing, digital payments, and digital finance all had a favorable and substantial influence on financial performance. The fundamental premise of the study is that digital payments and SMEs can enhance firm performance by concentrating on SME digitization and financial literacy among SME entrepreneurs. The restrictions on using the internet to distribute surveys have aided in-depth research on the phenomenon of SME behavior as compared to conducting in-person interviews. The Islamic banking industry is seen as one of the most effective mediums in da'wah and can facilitate the business system by using online money transfer technology provided by banks (Mohamad, Borhan, Mohamad, 2012). SME bank also assists in the success of the Asnaf business development (Hibrahim, 2021).

Mobile Marketing Technology Model (MMT)

Figure 2: Technology-Organization-Environment (T-O-E) framework and Mobile Marketing Technology Model (MMT)



Source: (Sunday, 2022)

The popularity and widespread use of mobile marketing technologies and devices have attracted the attention of researchers and practitioners, particularly in small and medium-sized businesses (SMEs), where budgetary constraints and a lack of human capital can make these technologies extremely beneficial. In an attempt to increase sales of goods and services, SMEs can improve their sales promotion methods by utilizing mobile marketing tools (figure 2) (Sunday, 2019). Utilizing qualitative methods, both studies (Sunday, 2019, 2022) show how important it is for businesses to employ technology to assist them in widely promoting their products.

Mobile marketing technology adoption and usage by small and medium-sized enterprises (SMEs) is increasing (MMT). To forecast and explain the adoption of MMT by small service organizations, this study aims to learn more about the proposed use of a grounded theory approach for examining elements within the Technology-Organization-Environment (T-O-E) framework (Sunday, 2022). To satisfy the contemporary desire for greater social interaction, this theory provides a more thorough and holistic framework with solid theoretical and empirical evidence. It fits nicely with the contemporary technological period, where the shift to the digital age has happened quickly on a global scale.

External Factors (Agencies Authorities): Asnaf entrepreneurs are generally asnaf, especially the underprivileged and needy who want to start their businesses. For this reason, the Zakat institution will give this group all of its support and attention (Ahmad, 2012). Esrati et al. (2018) concluded that factors other than capital could have a significant impact on a business's success. Zakat authorities need to address these factors to increase the likelihood of business success for Asnaf enterprises. Corporate involvement is crucial for ending poverty, promoting economic expansion, and bolsteringthe Muslim economy overall. The Asnaf Entrepreneurs Community Association of Melaka's (PKUANM) struggle is carried on by Koperasi Usahawan Asnaf Melaka Berhad (KUASA). On October 7, 2020, the cooperative was formally founded to advance agricultural goods (KUASA, 2022). The items include premix, cooking oil, cordial, ready-to-eat (RTE), and ready-to-drink (RTD).

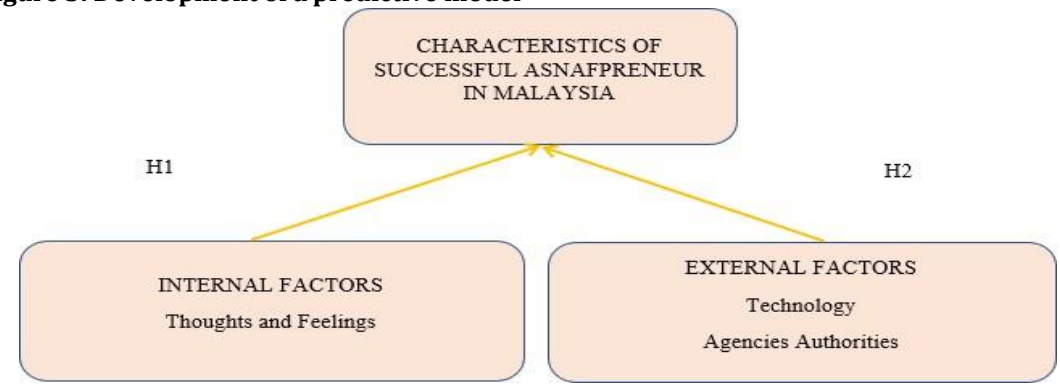
The zakat party offers business knowledge courses and skills to help do business for asnafpreneurs. Teaching people to be independent is the best approach to assist them. According to Rahman, et al. (2008), the needy and impoverished are the main target groups of the receivers of zakat help in the form of a business support scheme. Because the conditions are simple and simply demand a business permit as proof, those in need and

the impoverished have responded favorably to the business capital support project. Not only is there no need for a business plan, collateral, or guarantor, but most importantly, the help is given without any conditions attached and at no cost to the recipient.Here's an instance of how the relevant parties have commended the Zakat officials. Since the start of PPZ-MAIWP in early 1991, corporate zakat management, such as having professionals in the workforce, has greatly assisted the organization's growth and development (Alias, 2016).

As part of their strategic partnership, SME Bank and Yayasan Pembangunan Ekonomi Islam Malaysia (YaPEIM) expanded the Asnaf Entrepreneurship Program (ISHRAF) initiative's execution. As part of a plan designed to foster asnafpreneurs, asnafpreneurs from six states—Perlis, Kedah, Negeri Sembilan, Melaka,Sabah, and the Federal Territory of Kuala Lumpur—were included in the new project (Hibrahim, 2021). Depending on the kind of business and appropriateness, Selangor offers entrepreneurs between RM 2,000 and RM 50,000 in capital. An extra RM 5,000 in capital will be provided if the business expands. To help asnafpreneurs grow their businesses, the Lembaga Zakat Selangor (MAIS) will keep an eye on their operations and offer entrepreneurial support under the direction of MARDI, MARA, and other organizations (Abd Rahman, R., and Ahmad, S. 2011). With the Baitulmal Entrepreneur Tunas Program (TUB), whichwas launched in 2019, SME Corp. Malaysia and the Federal Territory Islamic Religious Council (MAIWP) are working together to change MAIWP asnaf entrepreneurs "From Zakat Recipients to Zakat Payers" by providing them with entrepreneurial training. The Baitulmal Entrepreneur Tunas Program (TUB) has assisted 84 asnaf entrepreneurs in improving their business operations by using the idea and model of the Bumiputera Youth Entrepreneurs Program.

In addition to offering zakat support, the Negeri Sembilan Islamic Religious Council (Muttaqin, Sidik, Sidek, 2021) also offers numerous entrepreneurial programs, including marketing tactics using the WhatsApp application, tomentor aspiring entrepreneurs. The initiative gave participants exposure to and opportunities to master various ways of marketing through the WhatsApp app, involving thirty asnafpreneurs. In addition, copywriting techniques and the Google Contact phone number storage feature are taught to the participants. The National Entrepreneurship Institute (INSKEN) and the Asnaf Profiling and Entrepreneurship Unit of the MAINS Distribution Division collaborated to organize the program.

Figure 3: Development of a predictive model



3. Methodology

To meet its stated goals, this study uses quantitative methodologies. The framework will be constructed using both primary and secondary data, with the built model being based on selected indicators identified from past research aims. Therefore, a structured Google form questionnaire will be created for asnafpreneur and distributed to around 90 asnafpreneur respondents who have been suggested by state zakat authorities as the primary data gathering strategy. The total number of respondents gathered is 84 people. For this study, secondary data will be obtained through data and information searches on the internet and in library activities.

The researcher will choose respondents for this study using a technique called purposeful sampling, which is sometimes referred to as non-probability sampling, based on their distinctive characteristics. Put differently, purposive sampling involves the "on purpose" selection of units. The zakat officer selected the research participant, who is an asnaf who owns a business. By using intentional sampling, the researcher will be able to

choose a particular example because it exemplifies a process or other related features that the researcher is interested in.

A non-probability selection technique will be used to select 20 to 30 asnaf as responders in each state. Sekaran (2010) states that there are between 30 and 500 responders. Professional recommendations from the State Religious Islamic Councils (SIRCs) officer determined who was chosen to answer. The Statistical Packageof Social Science (SPSS) software will be used for quantitative data analysis to address the research questions and objectives.

Hypothesis Testing: In this study, two hypotheses have been proposed. The null hypothesis (H_0) of each hypothesis states that there is no relationship between the independent and dependent variables, while the alternative hypothesis (H_a) contends that there is a significant relationship. Below are the alternate hypothesis and null hypothesis. The first independent variable hypothesis is:
H_0: Internal factors did not influence the successful characteristics of asnafpreneur in Southern Malaysia
H1: Internal factors can influence the successful characteristics of asnafpreneur in Southern Malaysia
The second independent variable hypothesis is:
H_0: External factors did not influence the successful characteristics of asnafpreneur in Southern Malaysia
H_2: External factors can influence the successful characteristics of asnafpreneur in Southern Malaysia

4. Analysis and Findings

Table 1: Reliability test

	N	%
Cases Valid ExcludedTotal	84	100.0
	0	.0
	84	100.0

a. Listwise deletion based on all variables in the procedure.
Scale: All Variables-Case Processing Summary

Reliability Statistics

Cronbach'sAlpha	No of items
.970	80

The Cronbach's alpha values of all the factors for the variables were compiled in Table 1 above, and all of them were safely over the 97% threshold, indicating that the reliability data have outstanding reliability. This implies that additional data analysis can rely on the data.

Respondent Profile: A total of 90 sets of questionnaires were sent out through 'The *WhatsApp group'* chat room to the selected respondents. The total data respondents had collected are 84 sets. According to the study, 70 respondents, or 83.3% of the total, are female. With 34 respondents (40.5%), the highest age range of respondents in this survey is 41 to 50 years old. Out of the total 49 responders, or 58.3%, the majority are married. The monthly business income of 43 entrepreneurs is less than RM 1,000 (51.2%). RM 1,000 a month is still insufficient to meet their family's needs, considering that the minimum monthly basic pay in 2023 will be RM 1,500.

A respondent profile such as type of business, total of workers, highest education level, and experience of being an entrepreneur is also been study as well. Approximately 58 responders, or 69% of the sample, work for businesses in the "Food and Beverage" (F&B) industry. Of all the responses, 79 have fewer than two employees on their premises, accounting for 94% of the total. 45 respondents (53.6%) had equal certificate levels, with SPM/SPMV being the average highest education level among the respondents. With 38 respondents (45.2%), the majority of respondents have at least two to five years of experience as entrepreneurs.

Next to be studied are several households, and opinions on whether the business can take you out of the asnaf category and occupied state. The highest number of households is 3 to 5 people with 47 people (56.0%). Most

ofthe respondents agree that the business they run can take them out of the asnaf category with 76 respondents (90.5%). The highest number of respondents came from Johor with 30 respondents (35.7%).

Table 2: Level of Successful Asnafpreneur (Dependent Variables)

Successful Asnafpreneurs Characteristics	Strongly Disagree (%)	Disagree (%)	Between Agreeing or Disagreeing (%)	Agree(%)	Strongly Agree (%)	Ranking (%)
I feel that internal behavior plays an important role in the successof asnafpreneurs in their business	1.2	1.2	1.2	26.2	**70.2**	1
I feel that external behavior playsan important role in the successful of asnafpreneur in their business	0.0	2.4	2.4	31.0	**64.3**	2
The mean average of 84 respondents	0.0	1.2	2.4	21.4	**75.0**	

As an example, we only show the dependent variable input, 2 elements in the respondent's opinion on the Successful Asnafpreneurs Characteristics analyzed (Table 2). The majority of respondents stated Strongly Agree against all those elements. The 84 respondents put a 75.0% average for the Successful Asnafpreneurs Characteristics.

For an independent variable, 21 elements in the respondent's opinion on the internal inputs analyzed in the studyare the respondent stated highly in 'Strongly Agree' against all those elements. The 84 respondents put a 51.2% average for the internal inputs. 32 elements in the respondent's opinion on the external analysis the respondent stated highly in 'Agree' against all those elements. The 84 respondents put a 66.7% average for the external inputs which are technology and agency authorities.

Highest and Lowest for Internal and External Factor: The highest component among internal variables according to the answer of this study is the first, 'I am an honest person in business'. Meanwhile, the lowest element in internal factors is 'I have the support of friends to do business', meaning that, indicating that most entrepreneurs do not agree with this statement. From a technological perspective, "I need to adapt my business conditions in line with the current age of digitalization" is a crucial component of an external factor for entrepreneurs. One aspect of the externaltechnology issue that many entrepreneurs are not as familiar with is the "software system that is in theinformation and communication technology equipment." It indicates that they are aware that, to remain competitive in the corporate world, they must embrace technology.

Agency authorities successfully apply an important element of external factor in asnafpreneurs which is that they know that 'paying zakat is my duty once I am able/successful in business'. Less important in terms of external information related to agency authorities is 'The zakat has provided a business space/site for asnaf entrepreneurs'. Because the majority of aspiring entrepreneurs were unable to reap the rewards, this element had a low response rate.

Hypothesis Testing: Below shows the relationship between internal factors towards characteristics of successful asnafpreneurs

Table 3: The Relationship between Internal Factors and Characteristics of Successful Asnafpreneurs

		Internal Factors (IV1)			
		Strongly Disagree	Agree	Strongly Agree	Total
Successful Asnafpreneur(DV)	Disagree	1	0	0	1
	Between Agreeing or Disagreeing	0	2	0	2
	Agree	0	15	3	18
	StronglyAgree	0	23	40	63
Total		1	40	43	84

Chi-Square Tests

	Value	df	Asymp. Sig.(2-sided)
Pearson Chi-Square	98.672[a]	6	.000
Likelihood Ratio Linear-by-Linear	26.892	6	.000
Association	29.299	1	.000
N of Valid Cases	84		

a. 8 cells (66.7%) have an expected count of less than 5. Theminimum expected count is 0.1.

Cross-tabulation analysis between Internal Factors with Characteristics of Successful Asnafpreneurs is shown in Table 3. The analysis found that the majority of respondents' views were at the Agree and Strongly Agree levels.Where 15 respondents express Agree to Internal Factors, simultaneously Agree in Successful.

Characteristics in Asnafpreneurs. While 23 respondents agreed with Internal Factors also stated that Strongly Agree with Successful Characteristics in Asnafpreneurs.

Additionally, three respondents indicated that they Strongly Agree with Internal Factors and Strongly Agree with the Successful Characteristics of Asnafpreneurs. 40 respondents expressed Strongly Agree for both Internal Factors variables with the Successful Characteristics in Asnafpreneurs. We can formulate the following hypothesis to determine how these two variables relate to one another:
H_0: There is no correlation between Internal Factors towards Successful Characteristics ofasnafpreneurs in Southern Malaysia
H_1: There is a correlation between Internal Factors towards Successful Characteristics of Asnafpreneur in Southern Malaysia

Chi-square Test analysis revealed that Pearson's significant value was at the 0.00 level. This indicates that it is less than 0.05 at this level. This test successfully rejects H_0, as demonstrated next. Internal factors and the successful traits of an entrepreneur are related. This implies that if internal factors improve, the successful characteristics of entrepreneurs in the studied area will also change. Below is the relationship between external factors towards characteristics of successful asnafpreneurs.

Table 4: The Relationship between External Factors towards Present Characteristics of Successful Asnafpreneurs

		External Factors (IV2)			
		Disagree	Agree	StronglyAgree	Total
Successful Asnafpreneur (DV)	Disagree	1	0	0	1
	Between Agreeing or Disagreeing	0	2	0	2
	Agree	0	15	3	18
	Strongly Agree	0	39	24	63
Total		1	56	27	84

Chi-Square Tests

	Value	df	Asymp. Sig.(2-sided)
Pearson Chi-Square	87.964[a]	6	.000
Likelihood RatioLinear-by-LinearAssociation	15.612	6	.016
	13.934	1	.000
N of Valid Cases	84		

a. 8 cells (66.7%) have an expected count of less than 5. Theminimum expected count is 0.1.

Table 4 displays a cross-tabulation analysis of external factors and successful entrepreneur characteristics. According to the analysis's findings, most respondents had opinions that fell between those of Agree and Strongly Agree. When fifteen respondents state that they Agree with external factors, they also agree that

entrepreneurs who are successful share certain characteristics. While 39 respondents agreed with External Factors and also stated that Strongly Agreed with Successful Characteristics of Asnafpreneurs.

Furthermore, 3 respondents stated Strongly Agree in External Factors and Strongly Agree forthe Successful Characteristics in Asnafpreneurs. 24 respondents expressed Strongly Agree for both External Factors variables with the Successful Characteristics in Asnafpreneurs. To see the relationship between these two variables, we can form a hypothesis as follows:
H0: There is no correlation between External Factors towards Successful Characteristics of asnafpreneurs in Southern Malaysia
H2: There is a correlation between External Factors towards Successful Characteristics of Asnafpreneurin Southern Malaysia

Chi-square Test analysis revealed that Pearson's significant value was at the 0.00 level. This indicates that it is less than 0.05 at this level. This test successfully rejects H0, as demonstrated next. External factors and the successful traits of an entrepreneur are related. This implies that changes in the research area's successful entrepreneur characteristics will follow improvements in external factors.

Table 5: The Coefficient Research Variables

Model	Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1 (Constant)	2.188	.437		5.008	.000	1.319	3.057
InternalFactors	.519	.107	.567	4.831	.000	.305	.733
External Factors	.045	.127	.041	.352	.726	-.208	.297

a. Dependent Variables: Successful Asnafpreneurs Characteristics

Table 5 shows the coefficients among all variables involved in the study, Successful Asnafpreneurs Characteristics (SAC), Internal Factors (IF), and External Factors (EF). Based on the coefficients of analysis, a formula can be formed as follows:
SAC = 2.2 + 0.5IF + 0.0EF

5. Conclusion and Recommendations

Conclusion: The level of dependent variables (successful asnafpreneurs characteristics) and independence variables (internal factors and external factors) are 75% of the respondents strongly agree that internal and external inputs are important in developing successful asnafpreneur characteristics. 51.2% of the respondents strongly agree and 47.6% of the respondents agree that the internal inputs listed are the key to building their good internal factors. For external factors, 66.7% of the respondent agree that external inputs also help to gain a good successful asnafprenur and their characteristics. The Cronbach's alpha values of all the factors for the variables were safely over the 97% threshold, indicating that the reliability data have outstanding reliability. This implies that additional data analysis can rely on the data.

Chi-square Test analysis revealed that Pearson's significant value was at the 0.00 level. This indicates that it is less than 0.05 at this level. The relationship between successful asnafpreneurs' characteristics with independence variables is (1) there is a relationship between internal factors and successful asnafpreneurs characteristics (have a relationship because H0 is rejected) and (2) there is a relationship between external factors and successful asnafpreneurs characteristics (have a relationship because H0 is rejected). Characteristic of successful asnafpreneurs formula is SAC = 2.2 + 0.5IF + 0.0EF.

Limitations of Study: The study's time constraint stems from the need to gather all the data from entrepreneurs in every state. Researchers should consistently remind entrepreneurs in the "WhatsApp Group" to respond to thesurvey questions during their free time. Additionally, researchers must frequently clarify or expand on the meaning of any terms used in survey questions. The majority of participants are between the

ages of 41 and 50, thus they frequently seek clarification on what they comprehend. Additionally, the majority of the respondents had SPM/SPMV level academic qualifications. As they did not use the word frequently, they most likely could have forgotten a few unusual words in a phrase.

Suggestions for Future Research: Due to time constraints, this study solely looks at Negeri Sembilan, Melaka, and Johor, the three southern states of Peninsula Malaysia. Additional researchers could examine the northern states of the Malaysian Peninsula and identify trends in entrepreneur behavior, as well as the distinctions and similarities among the management of each State Islamic Religious Council. Since this study solely employed quantitative methods, other researchers may choose to conduct their research using qualitative methods, or they may choose to combine qualitative and quantitative methods. Aside from that, academics are encouraged to investigate a variety of topics from many angles, including politics, economics, government policy, and much more. Waqf also has been proven as one of the tools for alleviating poverty around the world (Ibrahim and Rafien, 2017).

This framework can also be incorporated by the State Islamic Religious Council offices into the asnaf entrepreneur training module, which will assist asnafpreneurs in recognizing the critical personal attributes that they should work on developing to accomplish more in the future. The significance of paying zakat directly to the zakat centre might also be known by the general public. This is intended to support aspiring and established business owners by offering funding to expand their ventures.

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Gig Economy: Is It a Trap or Stepping Stone for the Informal Sector?

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Abstract: The informal sector and technology have complex interactions, shaping economic activity, job trends, and social outcomes, especially with the rise of the "gig economy", in which individuals work on an as-needed basis through online platforms. This article explores several theoretical frameworks, such as modernization theory, dependence theory, structuralist approaches, and post-structuralist viewpoints, and investigates how different frameworks explain the effects of technology on informal economic activity. This article also reviews for comprehending the correlation between the informal sector and technology. Besides that, this article explores the dual nature of the gig economy, examining whether it serves as a trap that perpetuates the vulnerabilities of the informal sector or as a stepping stone toward more excellent economic stability and mobility. Although the gig economy provides opportunities for income generation, skill development, and flexible working conditions, it also presents substantial challenges, such as job insecurity, a lack of benefits, and potential exploitation. This paper also addresses the implications for policy and future research directions by the sustainable development goal (SDG) of fostering sustainable, inclusive, and long-term economic growth, as well as full and productive employment and decent work for all.

Keywords: *Gig Economy, Informal Sector, Labor Economics, Informal Employment.*

1. Introduction and Background

For the past decades, the booming of the digital economy has offered new jobs for individuals involved in formal and informal sectors. The combination of rapid digital transformation, the expansion of information and communication technologies, and the extended period of economic inactivity in the manufacturing industry has significantly transformed the worldwide labor market and employment trends (Donovan et al., 2016; Stewart & Stanford, 2017; Kassi & Lehdonvirta, 2018). Indeed, the expanding relevance of the digital economy is crucial for the country to offer jobs, especially for the growing technologically savvy educated labor force. It also supplements the rising number of self-employed individuals who rely on the Internet to communicate with potential clients. As a result, the informal sector's scope and employment quality are also affected by the digital revolution of labor.

In recent years, an increasing number of people have joined the gig economy, searching for additional income or as their primary source of income. Moreover, it is influenced by the flexibility of working hours and location and the freedom to select the type of job (Stefano, 2016). After the COVID-19 crisis and the subsequent spike in unemployment, many professionals and skilled laborers started working online to maintain their standard of living. Consequently, it allowed the gig economy to proliferate quickly, creating bottom-up demand and supply in the online market. Many people, including students looking for employment, retirees, and those with low and high skills, also turn to gig work to make a living. Gig work has opened up new opportunities for underemployed or jobless people to transition from full-time employment to a new online-based flexible employment (Huang et al., 2020).

The term "gig economy" refers to this short-term job phenomenon, a metaphor taken from the music business, in which musicians are paid to play live shows. It was first driven by experienced IT professionals who began using online digital platforms to hunt for gig economy opportunities. The gig economy is often referred to as the 'platform economy', 'on-demand economy', or 'sharing economy'. It relates to the demand and supply of temporary or task-based labor (Howe, 2006; Cherry, 2016; Felstiner, 2011; Bergvall-Kåreborn & Howcroft, 2014; Eurofound, 2015).

As stated by ILO (2020), while the gig economy is an attractive alternative source of income, data reveal that on a worldwide scale, the gig economy tends to attract more young individuals, those aged 25 to 34 (46.2%) and 35 to 44 (32.5%). Pew Research Center (2016) found that 24% of Americans made money via the digital

'platform economy' the previous year. According to the study, this source of income is crucial for younger individuals. Meanwhile, according to the McKinsey Global Institute (2016), approximately 20-30% of the working-age population, or up to 162 million individuals in Europe and the United States, are involved in some form of independent work.

Because of internet technology and social media growth, younger adults have quickly adopted this new way of life. According to Hershatter & Epstein (2010), the gig economy frequently arises due to its online platform element, enabling millennials to utilize their talents and abilities, such as freelance photographers and videographers, social media content creators and influencers. This argument highlights the fact that many millennials are leaving traditional jobs for freelance work, which provides them with greater freedom and flexibility. Research published in the Harvard Business Review (2018) revealed that gig workers value flexibility, independence, and the opportunity to pursue their passions, with over 74% of respondents reporting high satisfaction with gig employment.

Given the limited evidence of the relationship between the gig economy and the informal sector, this paper seeks to investigate two questions. Firstly, how does technology affect the informal sector? Secondly, what are the gig economy's implications for the informal sector? This paper addresses critical questions about its role in economic development and social protection. This study also contributes to the literature in two ways. Firstly, this paper provides a theoretical framework for comprehending the direction of the gig economy in the informal sector. Secondly, this research illustrates both the advantages and disadvantages of the gig economy. The remainder of the study is presented as follows. The following section elucidates a comprehensive literature review of conceptual approaches defining the informal sector and technology. The third part discusses the technological impacts on the informal sector. The fourth section comprises the intersections between the informal sector and the gig economy. The following section discusses the challenges and risks of the gig economy. Finally, the last section summarises the implications and discussion by presenting a brief conclusion, limitations, and possible future studies.

2. Conceptual Approaches: Defining the Informal Sector and Technology

The informal sector, which includes non-regulated or recognized economic activities, plays a significant role in global labor markets, especially in developing nations. The rapid advancement of technology, mainly digital technologies, has brought new modifications to the informal sector, influencing how informal businesses operate and interact with formal economic systems. Technology refers to digital tools and innovations, including mobile phones, internet access, digital platforms, and financial technologies (fintech). The informal economy's technology integration can potentially influence economic activities and employment patterns in a transformative and disruptive manner. This section explores the conceptual approaches to understanding the intersection of the informal sector and technology, providing insights into the theoretical frameworks that guide this understanding.

Modernization Theory: The word "modernization theory" originates from older concepts of economic development (Geertz, 1963; Lewis, 1954; Rostow, 1959). The informal sector is viewed as a step in the market economy's developmental process (Lewis, 1954; Rostow, 1959; Harris and Todaro, 1970; Rauch, 1991). In this view, informal activities will cease to exist as a result of economic development in emerging nations. Workers with lower levels of human capital are more likely to find employment in informal and smaller firms that receive lower wages. On the other hand, workers with higher levels of human capital are more likely to find employment in larger, more productive firms, where they receive higher wages.

Based on this theory, the informal sector is said to result from a surplus of labor supply. As the economy becomes more modernized, the "excluded" informal laborers will eventually find employment in the formal market. Modernization theory suggests that economic development and technological advancement are inherently linked, with technology driving progress and modernization. From this perspective, adopting technology in the informal economy is seen as a pathway to formalization and economic development. Technology is expected to increase productivity, enhance market access, and integrate informal businesses into the formal economy.

Consequently, according to the modernization theory, the adoption of technological advancements has the potential to assist in bridging the gap between the informal and formal sectors, hence fostering economic growth and development. Bosch, Goni-Pacchioni, and Maloney (2012) conducted an empirical study that utilized data from Latin American countries, which showed that the impact of economic growth, industrialization, and technology adoption had reduced informal employment. Technology helped informal laborers in Brazil and Chile migrate to salaried jobs. Over a decade, informal employment in Brazil dropped 10% due to policies that formalized businesses and labor. This corresponds with modernization theory's assumption that economic development, driven by technological advances, facilitates the progressive shift of labor from the informal to the formal sector. Policies should, therefore, focus on facilitating access to technology and supporting digital literacy among informal workers.

Dependency Theory: This approach emerged as a counterpoint to modernization theory, which views technology as a universal driver of progress. Dependency theory originated in the 1960s and 1970s, primarily through the works of scholars such as André Gunder Frank and Immanuel Wallerstein. The theory proposes that the disparities in global economic conditions result from historical colonialism and economic exploitation processes. According to this theory, developed countries (the core) exploit developing countries (the periphery) through unequal trade relationships and the extraction of resources and labor (Frank, 1967; Wallerstein, 1974). This dynamic creates a dependency that hinders the economic development of peripheral countries and continues to maintain their inferior status.

In addition, dependency theory offers a contrasting view, arguing that technological advancement can boost existing inequalities and dependencies. From this perspective, integrating technology into the informal sector may lead to the exploitation and marginalization of informal workers. Technological tools and platforms, often controlled by large corporations, can extract value from informal labor without offering equivalent benefits. In brief, dependency theorists argue that technology controlled by developed countries and large corporations might contribute to the ongoing marginalization and exploitation of workers in developing nations and informal sectors. Subsequently, the dependency theory highlights the risks of exploitation and disparities in development associated with technological adoption in the informal sector.

To support this argument, the World Bank (2019) highlighted the widening digital gap in Sub-Saharan Africa, where urban elites can access internet infrastructure while rural informal laborers do not. Technological integration favors urban populations but not rural laborers, worsening regional inequality. This example emphasizes the unequal distribution of technological benefits within developing countries, where access to technology remains concentrated among privileged populations, further marginalizing informal laborers in rural areas. Additionally, the OECD Development Centre's (2020) findings are consistent with dependency theory, as they illustrate how dependency relationships can be worsened by reliance on foreign technology, which in turn keeps developing countries reliant on developed nations for essential technological infrastructure. Therefore, the empirical studies suggested that the policies should protect informal workers from exploitation and ensure that technological advancements are inclusive and equitable.

Structuralist Approaches: Moser (1978) and Castells and Portes (1989) promoted the structuralist school. Structuralist approaches focus on the structural conditions that shape economic activities and labor markets. These approaches emphasize the role of institutions, regulations, and economic structures in determining the outcomes of technological integration in the informal economy. Technology can either reinforce existing structures of inequality or disrupt them, depending on how it is implemented and regulated.

Chen et al. (2004) discussed that according to this theory, informal economic units (micro-enterprises) and employees are subjugated to minimize input and labor costs, enhancing major capitalist firms' competitiveness. The informal economy may be seen as a structural component of the modern development of capitalism. By exploiting unprotected informal laborers (such as women, youth, immigrants and unskilled), capitalist businesses aim to decrease wages, and labor safety requirements, and increase flexibility with the government's assistance. The informal sector is viewed as a consequence of globalization and capital accumulation, where it is not a phase in the transition from a traditional to a modern economy. It is not dependent on the formal economy's failure to absorb workers or on the voluntary decision of self-employed individuals. Therefore, according to structuralists, the informal sector is common in developed nations.

A study by Tokman (2007) found that multinational firms in Latin America minimize production costs by using informal laborers with lower labor standards, especially in textiles and manufacturing. Supporting the structuralist perspective, this study showed that even when technology and automation reduced manufacturing costs, informal laborers continued working in vulnerable conditions and earning low salaries. In addition, Chant and Pedwell (2008) found that communication and microfinance technology have created economic opportunities for women in informal businesses in Sub-Saharan Africa, but the lack of regulatory oversight leaves them vulnerable to exploitation. Despite technological advances, women in agriculture and handicrafts are underpaid and excluded.

These studies support the structuralist claim that institutional frameworks influence technological uptake where the lack of regulatory protections perpetuates the informal sector exploitation of workers. In short, structuralist approaches propose that institutional and regulatory frameworks operate as intermediaries in influencing the effect of technology on the informal sector. Policies should, therefore, focus on creating supportive regulatory environments that facilitate positive outcomes from technological adoption.

Post-Structuralist Perspectives: Post-structuralism emerged as a critique of structuralist theories, which tended to view social and economic structures as stable and deterministic. Instead, post-structuralists argue that social and economic realities are constructed through language, power relations, and cultural practices and are, therefore, fluid, contingent, and subject to constant change (Foucault, 2013; Derrida, 2016). However, post-structuralist viewpoints require a more refined understanding to comprehend the informal sector and its interaction with technology fully.

In the informal sector and technology context, post-structuralist perspectives focus on how technological advancements disrupt traditional jobs and create new forms of economic activity. Post-structuralist perspectives challenge the dual distinctions between formal and informal economies, emphasizing economic activities' fluid and dynamic nature. These perspectives highlight the diverse and context-specific ways in which technology interacts with informal economic activities. Technology can enable new forms of informal work, create hybrid economic spaces, and redefine the boundaries between formal and informal sectors. This is where the gig economy comes in the way laborers frequently work in an ambiguous space: they are not exclusively formal or informal employees.

To support this argument, digital freelancing platforms like Upwork and Freelancer in India have blurred the lines between formal and informal labor, according to Aneesh (2015). These platforms employ workers in flexible, non-formal roles without contracts, job security, or benefits. These platforms have produced a hybrid economy where freelancers switch jobs based on their skills and technology. Meanwhile, Grab and Gojek have altered Southeast Asia's transportation business, establishing hybrid economic activities where these p-hailing and e-hailing drivers deliver their jobs informally yet use formal digital platforms. Lim (2018) found that many drivers or riders work under informal conditions with flexible hours and no formal employment status, even though the platforms require registration and legal compliance.

These scenarios show how post-structuralists see technology disrupting economic systems. Ride-sharing platforms connect informal workers to structured digital systems, fluidizing labor markets. Therefore, they suggest that policies should be flexible and context-specific, recognizing the diversity of informal economic activities and how technology can be integrated.

To summarise, the effects of technology on informal economic activity can be viewed through different perspectives of the various theoretical frameworks—modernization theory, dependency theory, structuralist approaches, and post-structuralist viewpoints. Collectively, these frameworks offer a thorough comprehension of the diverse, complex, and frequently conflicting ways in which technology influences informal economic activities, thereby highlighting the necessity of inclusive, adaptive policies that respond to particular countries.

Technological Impacts on the Informal Sector

The informal sector is subject to significant and varied effects brought about by technology, which in turn affects how workers in the informal sector conduct business, access markets, and interact with formal economic structures. This section aims to investigate how technology influences the informal sector, stressing

both the positive and negative implications of these changes.

In particular, technology can enhance productivity and economic growth within the informal sector by improving business communication, marketing, and operations. Digital platforms can provide informal businesses with new markets and customer bases (Heeks, 2017). Social media platforms such as Facebook, Instagram, and WhatsApp also serve as marketing and sales channels for informal businesses, allowing them to advertise their products and engage directly with customers (Donner & Escobari, 2010). These platforms, including the growing and popular TikTok platform, enable informal sector workers to access more extensive and diverse markets. Besides that, marketplace platforms like eBay, Amazon, and local equivalents allow small-scale producers and sellers to sell their products online, attractive to customers outside of their geographical region (Graham et al., 2017).

In addition, technology can facilitate job creation and entrepreneurship in the informal sector. Digital platforms like ride-sharing and e-commerce sites offer new opportunities for income generation (Graham et al., 2017). Mobile technology can support micro-entrepreneurs by providing access to information and resources that were previously unavailable (Donner, 2007). Digital platforms such as Uber, Upwork, Grab, Foodpanda and TaskRabbit have created new opportunities for informal workers to engage in gig and freelance work. These platforms provide flexible work arrangements and the ability to earn income task-by-task (De Stefano, 2016). Advances in communication technologies have also enabled telecommuting and remote work, offering informal workers opportunities to participate in the global economy from their local contexts (Kässi & Lehdonvirta, 2018). This transition can enhance work-life balance and diminish the necessity for migration to urban areas. However, it also presents concerns regarding the digital gap and inequitable technological access (Graham et al., 2017).

Technology can also facilitate skill development and education for informal sector workers. Online learning platforms and mobile apps can provide training and resources to improve business practices and technical skills (Aker et al., 2016). In addition, mobile learning applications allow informal sector workers to learn at their own pace and on their schedule, offering flexible learning opportunities that can be customized to meet their specific requirements (Aker & Mbiti, 2010). Hockly (2018) added that microlearning platforms that offer short, targeted learning modules are especially suitable for informal workers. These platforms provide quick lessons on specific skills that can be immediately applied, enhancing job performance and productivity. Virtual simulations and video tutorials are essential for developing skills that require visual demonstration, including carpentry, plumbing, and electrical work (Traxler & Kukulska-Hulme, 2007).

ICTs, including smartphones and internet access, enable informal workers to access information on market prices, weather conditions, and best practices in their respective industries. This information can improve decision-making and increase productivity (Aker & Mbiti, 2010). Technology also facilitates better supply chain management and inventory control for informal businesses, reducing waste and improving efficiency (Qiang et al., 2011). Automation and digital tools can also streamline administrative tasks such as bookkeeping and tax filing, allowing informal businesses to operate more effectively and potentially transition to formality (Heeks, 2017). In addition, mobile applications facilitate the efficient management of appointments, deliveries, and customer feedback by informal businesses, thereby directly influencing customer satisfaction and productivity (Donner, 2007).

Financial technology (fintech) innovations, such as mobile money and digital payment systems, have significantly increased financial inclusion for informal sector workers. These technologies enable secure transactions, savings, and access to credit, which can support business growth and resilience (Jack & Suri, 2011). Besides that, these services offer a secure and efficient means of transferring money, saving, and accessing credit, which are crucial for business operations (Donovan, 2012). Financial inclusion through mobile money reduces the reliance on cash transactions, lowers transaction costs, and enhances the ability of informal workers to invest in their businesses, indirectly improving business productivity by reducing the necessity for physical travel, lowering transaction costs, and providing a secure method of saving money (Suri & Jack, 2016). Digital credit platforms provide small-scale loans to informal workers who typically do not have access to traditional banking services. This access to capital is crucial for expanding business operations and improving efficiency (Galbraith, 2017).

In conclusion, technology significantly impacts the informal sector, offering opportunities for market access, productivity improvements, and new employment forms such as gig employment. In the next part, we will discuss the intersections between the informal sector and the gig economy due to the impact of technological progress.

3. Intersections Between the Informal Sector and the Gig Economy

The gig economy and the informal sector are two dynamic components of the global labor market. While the informal sector has long been a feature of economies, particularly in developing countries, the rise of the gig economy has introduced new dimensions to informal employment. This section aims to synthesize existing research on the relationship between the informal sector and the gig economy, exploring how these two sectors interact and the implications for workers and economic development.

Informality is still relevant today because of the widespread and increasing incidence of various forms of informality. Compared to the past, informal workers nowadays are associated with individuals in the informal sector, such as traditional street vendors or home-based workers, and contract or gig workers hired by formal businesses (Sazali & Gen, 2019). The altering nature of work was recognized at the 2018 International Conference of Labour Statisticians (ICLS), which recommended a new classification to reflect the blurring lines between formal and informal employment. For example, there is a distinction between self-employed or entrepreneurs and contract workers in the case of platform workers such as e-hailing drivers and p-hailing riders. In general, the informal sector encompasses economic activities that are not subject to formal business regulation or taxation and are not monitored by the government. Workers in this sector usually do not have secure employment contracts, legal rights, or social protections. Both sectors involve flexible, non-traditional employment forms. However, the gig economy is often mediated through digital platforms, differentiating it from the broader informal sector, which might not utilize digital means.

According to Heeks (2017), the International Labour Organization (ILO) recognizes gig workers as a vulnerable labor market sector because of the chronic precariousness and structural inequities caused by informal employment. In brief, the gig economy comprises short-term contracts or freelance work instead of permanent jobs, facilitated mainly through digital platforms. De Stefano (2016) considered “crowd work”, which refers to working activities including the completion of several tasks via online platforms and “work-on-demand visa applications”. The work is accomplished through apps managed by businesses, examples of work that can be performed in the gig economy. This sector is characterized by on-demand work that provides flexibility but lacks traditional employment protections. Most gig workers combine multiple tiny “gigs” to make a living since they have to compete with many other workers for jobs, which further worsens their sense of exclusion (Tran & Sokas, 2017). Gig employment may be well-paid and safe. Nevertheless, both sectors experience income instability compared to formal employment due to the transient nature of job opportunities and the absence of employment benefits.

Work processes have been transformed due to the growth of business models based on smart platforms in the digital era (Scuotto et al., 2020). There is a gap in the global landscape in which this phenomenon cannot be conceptually described and statistically assessed uniformly to produce a comparable metric across nations. According to Messenger (2018), gig workers are typically independent, geographically dispersed, and in direct competition with each other. Hence, they are frequently categorized as independent contractors. Gig employment is often performed on a task- or event-by-task basis, and it has a more significant presence in online and offline platforms for labor (De Stefano, 2018). The on-demand labor force prefers non-traditional employment, which promotes the flexibility of both income and working hours (Gleim et al., 2019). Similarly, the digital economy environment enables the gig economy’s growth and a peer-to-peer design to increase information sharing and social decision-making processes (Kaine & Josserand, 2019).

According to MacDonald and Giazitzoglu (2019), the gig economy may bring about new economic gains but also give rise to new economic challenges. Ravenelle (2019) says that platforms for the gig economy can be seen as a “psychological contract violation” for workers and a barrier to the spread of individual loci of knowledge, which makes jobs less secure and lower-quality entrepreneurial activities more common. On the other hand, Burtch et al. (2018) say that platforms for the gig economy reduce the number of low-quality

entrepreneurial activities since they choose only the most solid business ideas. Because of this, it is now widely acknowledged that the gig economy is a new employment structure brought about by the rise of new technology (Gleim et al., 2019; Maalaoui et al., 2020).

To sum up, digital platforms offer access to a broader range of jobs and clients, potentially increasing earnings and reducing the dependence on local markets (Heeks, 2017). The gig economy and the informal sector offer flexibility and autonomy in work. This flexibility can benefit workers with caregiving responsibilities or those seeking to supplement their income. However, this often comes at the cost of job security and stability (Graham et al., 2017). The gig economy can facilitate skill development and entrepreneurial activities within the informal sector. Platforms like Upwork and Fiverr allow workers to market their skills globally, build their portfolios, and gain experience in various fields (Donovan et al., 2016). Therefore, the gig economy can provide new income-generating opportunities for workers in the informal sector.

4. Challenges and Risks

While technology can create jobs, it can also lead to job displacement and exacerbate inequality. Automation and digitalization may replace certain types of informal work, leading to unemployment and income loss for low-skilled workers (ILO, 2018). The benefits of technology are often unevenly distributed, with those lacking digital literacy or access to technology being left behind (Graham et al., 2019). The digital divide remains a significant challenge, particularly in developing countries. Limited access to technology and the Internet can prevent informal sector workers from fully benefiting from technological advancements. Therefore, cost, infrastructure, and digital literacy contribute to this divide (World Development Report, 2016).

While the gig economy can offer pathways for economic mobility for informal sector workers by providing access to higher-paying gigs and opportunities for skill development, the lack of stability and benefits can limit long-term economic advancement (Farrell et al., 2018). The gig economy can exacerbate income inequality, as workers with higher skills and better access to technology are more likely to secure well-paying gigs, while lower-skilled workers may struggle to find sufficient work (Schwellnus et al., 2019). The informal nature of gig work often means that workers do not have access to social protection and security such as health insurance, retirement benefits, or unemployment insurance. The absence of these benefits also places a greater burden on public resources, potentially increasing the costs to society in the long term. This lack of social safety nets can increase vulnerability and poverty (Berg, 2015).

One of the primary challenges of the gig economy for informal sector workers is job insecurity. Gig work is often characterized by irregular income, lack of benefits, and minimal labor protections, which can exacerbate the vulnerabilities associated with informal work (Rosenblat & Stark, 2016). Digital platforms can create power imbalances between workers and employers, leading to potential exploitation. Gig workers may face issues such as low pay, unfair working conditions, and lack of bargaining power (Wood et al., 2019). The rapid growth of the gig economy has outpaced regulatory frameworks, leading to gaps in labor rights and protections for gig workers. This regulatory lag can leave informal sector workers without legal recourse in exploitation cases or unfair treatment (Codagnone et al., 2016). Gig workers may be misclassified as independent contractors rather than employees, leading to exploitation and denial of workers' rights and protections (Rosenblat & Stark, 2016).

The lack of stable, predictable employment can lead to economic uncertainty for workers, which may negatively impact consumer spending and hinder long-term economic planning (Kalleberg, 2011). These effects can be particularly pronounced during economic downturns, where gig jobs are often the first to be cut, exacerbating economic instability (Wood et al., 2019). This issue can perpetuate the vulnerabilities associated with informal work. Therefore, the rapid pace of technological change poses challenges for regulation and policy. Governments often struggle to keep up with the innovations in the informal sector, leading to gaps in protection and oversight (Heeks, 2017).

Besides that, the informal nature of gig work also complicates taxation and regulation, often leading to lower tax revenues than traditional employment sectors. Tax authorities struggle with enforcement, as tracking income generated through these platforms can be elusive due to the lack of formal reporting mechanisms and

the use of third-party payment processors (Smith, 2016). Many gig workers are either unaware of their tax obligations or deliberately evade taxes due to the perceived transience of their jobs (Oei & Ring, 2017). This loss of revenue can affect public investment in infrastructure, education, and health, which are critical for sustainable economic growth (Schwellnus et al., 2019). The evasion of income taxes and related contributions affects the ability of governments to fund essential public services and infrastructure, which are crucial for long-term economic growth (Auerbach & Hassett, 2015). The lack of clear regulatory frameworks can hinder the sector's development and contribute to market inefficiencies (Prassl & Risak, 2015). Thus, the decentralized and informal nature of gig work complicates tax compliance.

Even though technology can boost productivity, generate employment opportunities, and advance financial inclusion in the informal sector, it also poses substantial threats, such as the displacement of jobs, inequality, unfair treatment of workers, and loss of tax revenue.

5. Implications for Policy and Future Research

The gig economy, characterized by flexible, on-demand work facilitated through digital platforms, offers significant potential to formalize aspects of the informal sector. There are several ways in which the gig economy can contribute to this formalization process, such as improved tracking and documentation and access to financial services. Typically, gig economy platforms require participants to register and log their activities digitally. This process generates a record of their work history and earnings, creating a verifiable digital footprint often lacking in traditional informal work settings. By partnering with gig economy platforms, governments can facilitate formalization efforts. These partnerships could focus on ensuring that platforms operate within legal frameworks, contribute to tax collections, and provide necessary data to local authorities to help in policymaking and planning.

Policies should also ensure that technological advancements are inclusive and beneficial for all informal sector workers. This includes promoting access to technology, digital literacy, and financial inclusion. Many gig platforms offer training to their workers to ensure quality service. This training helps workers develop professional skills that can elevate their employability and transition them into more formal roles within or outside the gig economy. Some platforms provide certifications for completed training, which can be recognized by other employers and institutions, further integrating workers into the formal economy. Governments can invest in education and training programs to support workers transitioning from the informal to the formal gig economy. These programs would focus on digital literacy, rights awareness, and specific skills training to increase the employability and productivity of workers within the gig economy.

In addition, governments should develop regulatory frameworks that protect informal workers from exploitation and ensure fair treatment. This includes addressing issues such as job security, benefits, and labor rights. While the gig economy presents opportunities for formalization, it also poses challenges such as job insecurity and potential exploitation. Therefore, policy interventions are crucial to ensure that the transition from informal to formal work within the gig economy is beneficial, sustainable, and inclusive. Governments can use data and insights from gig economy platforms to craft policies that better meet the needs of flexible and informal workers, ensuring they receive legal protections and benefits. By leveraging technology, regulatory reforms, and strategic partnerships, the gig economy can play a transformative role in reducing informality and integrating more workers into the formal economy, ultimately contributing to broader economic development and stability.

Future research should adopt an intersectional approach, considering how factors such as gender, age, and ethnicity intersect with technology and informality because different countries might develop and experience different factors and impacts of informality. This can provide a more comprehensive understanding of the impacts of technology on the informal sector.

Conclusion

The relationship between the informal sector and technology is complex and multifaceted, influenced by various conceptual approaches. While technology has the potential to enhance productivity, create jobs, and promote financial inclusion in the informal sector, it also presents significant risks, including job displacement,

inequality, and exploitation.

The gig economy can serve as a stepping stone for some workers in the informal sector. By providing opportunities for income generation, skill development, and entrepreneurial endeavors, gig work can help individuals transition to more stable and formal employment. The digital nature of gig platforms can also facilitate greater access to economic opportunities for marginalized groups. Conversely, for many workers in the informal sector, the gig economy can be a trap that perpetuates their vulnerabilities. The lack of job security, benefits, and protections can leave gig workers in a precarious position, struggling to make ends meet and vulnerable to exploitation. Moreover, the gig economy's flexibility can be illusory, as workers may have little control over their working conditions and earnings.

Other than that, creating supportive environments for technological adoption in the informal sector can help maximize its benefits. This includes providing infrastructure, training, and resources for informal workers. Policymakers and stakeholders must navigate these dynamics carefully, ensuring that technological advancements are inclusive and beneficial for all informal sector workers. Future research should continue to explore technology's diverse and context-specific impacts on the informal sector, address existing gaps, provide insights that can inform effective policies and interventions, and offer deeper insights into the long-term and diverse impacts of the gig economy on the informal sector.

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Determining the Root Causes of Project Delay: A Case Study

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Abstract: The study aims to identify and analyze the reason for the project delay in ABC Company located in the heart of Malaysia specializing in oil and gas and oil and gas-related products. The study utilized observation techniques and data from an official report. The observation was done on an ongoing project and the assessment of record was done on previously completed projects. The outcome of such observation was analysed and simplified using a tool namely the Cause and Effect Diagram or Fishbone Diagram. The study found that shortage of manpower, local authority approval, improper planning, and the COVID-19 pandemic as the root causes that led to project delay.

Keywords: *Fishbone diagram, cause and effect diagram, project delay, project management, root causes of delay*

1. Introduction

General project planning, coordination, and control from beginning to end are all included in the definition of construction project management, which also embraces innovation, growth, and modification in operational activities (Al Jashaami, 2021). Its goal is to satisfy the client's requirements by producing a physically usable construction project, finished within the project's allotted time, and compliant with established costing, quality, and standards (Romzi & Doh, 2022, Khahro & Memon, 2018). Construction delays cost money, therefore completing projects on schedule benefits both the project and the construction crew. Along with cost and quality, project scheduling is commonly acknowledged as a critical element of the construction management life cycle and one of the criteria that determines a project's success (Hamzah et al., 2011). Despite its significance, project delays affect most construction projects (in both developed and developing countries), which is a serious issue (Tariq & Shujaa Safdar Gardezi, 2022). Thus, this paper's goal is to pinpoint the different reasons behind project delays and recommend preventative measures that should be taken. Another way to describe construction delays is when a project is completed after its scheduled completion date (Yap et al., 2021). Researchers have examined construction delays in a variety of ways. While other research clarified the numerous approaches to mitigate it, some studies explored the various reasons for delay in various parts of the world and various project formats (Khahro & Memon, 2018).

Hamzah et al. (2011) outlined the main reasons behind project delays in Malaysia's construction sector. These include subpar site management, poor planning, a lack of labor, insufficient client financing and payments for finished work, issues with subcontractors, insufficient contractor experience, a shortage of materials, the availability and malfunction of construction equipment, a breakdown in communication between parties, and mistakes made during the building stage. Likewise, Ansari et al (2019) determined the main reasons for building project delays in Saudi Arabia, a questionnaire survey was done. Lack of funding to complete the job and red tape were found to be the two main factors contributing to project delays. In Pakistan, Wahdan, Abu Yousef, and Farid (2019) conducted a similar analysis, and the following conclusions were deemed to be the most significant: problems with finances and payments, poor planning, a natural disaster, bad site management, a shortage of supplies and equipment, and contractors with insufficient experience. Conversely, there have also been delays in construction projects due to the COVID-19 pandemic. A few of the projects are getting postponed and terminated (Romzi & Doh, 2022). Similarly, Gara et al. (2022) said that projects are suspended, and delays are unavoidable due to lockdowns and restriction controls in the majority of countries. Due to the requirement for construction workers to maintain social distancing to prevent viral illnesses, production will also be restricted (Yin et al., 2022).

2. Literature Review

Project delay

One of the main issues that project managers frequently face is delay. Delays in construction projects usually have negative consequences for the parties involved (Serrador & Turner, 2015). Additionally, it's believed that the consequences of construction delays are what follows when a project's delays have unclear causes (de Almeida et al., 2021). These outcomes usually have a significant impact on a project's end (Nabilla et al., n.d.).

A delay can be defined as a time overrun or extension of time to complete the project (Shah Ali et al., n.d.). It is impossible to completely prevent construction delays, particularly when they are caused by events outside of our control. As a result, a delay occurs when a construction project's actual progress lags its anticipated timeline or when it is completed later than expected. Delays can occur for a variety of reasons and events (Al-Mohammad & Jamaludin, 2018a).

Delays can be frustrating and costly (Ren et al., 2008). There are several reasons why projects veer off course and miss their deadlines. Therefore, before beginning to address the delays, managers and the project management team must comprehend the reasons behind project delays.
For this study, the authors identified four common causes that can be applied to the company's project:

Manpower: Some can focus on a task for longer than necessary. Alternatively, they might lack knowledge and expertise (Al-Mohammad & Jamaludin, 2018b).
Planning: The dynamic nature of a project creates flexible planning that requires some alterations. Time is always the arch enemies of a project manager especially in the distribution of tasks (Agyekum-Mensah & Knight, 2017).
Third-party factors: Most projects include outside parties, and although these parties typically don't have complete knowledge of your objectives, strategies, or crucial project milestones at this point, they are often the ones who hold the key to making the project happen. They do not participate in discussions that happen in your team (Nabilla et al., n.d.).
Unforeseen circumstances: Natural catastrophes or weather-related interruptions might occur at any time. They could put your project behind schedule. Do not forget the political and investment environment as well (Yin et al., 2022a).

3. Methodology

Data Collection

Research data is the collection of data that has been condensed into a narrative and is then interpreted to yield insights. It makes sense that the data analysis method helps to divide large amounts of data into more manageable chunks (de Almeida et al., 2021). Three key processes occur during the data analysis process: data organization, summarization, and categorization, which together make up the second best-known technique for data reduction. It facilitates the identification and connecting of data by assisting in the discovery of patterns and themes. Data analysis is the third and final method that researchers use. They can perform it both top-down and bottom-up (Ren et al., 2008). This study focuses on 20 completed projects and 5 ongoing projects that have been marked delayed ranging from 2019-2021. The policy of the company stated that project delivery that exceeds 30 days of projected progress will be marked as late, and thus considered delayed. The reason behind the delay is reported in the project progress report and classified into common causes of project delay.

Cause and Effect Diagram

When problems develop and their underlying causes are identified, the Ishikawa diagram also called the Fishbone diagram, is a visual aid that may be utilized in any kind of work to help with the mental organization and processing of concepts, points of view, and conclusions (Liliana, 2016). The aforementioned chart serves as a useful tool for the rational and methodical analysis of the causes and sub-causes of specific issues or impacts that impact a certain activity, irrespective of its nature (Satya, 2016). Ishikawa diagrams, also known as fishbone diagrams, herringbone diagrams, cause-and-effect diagrams, or Fishikawa, are causal diagrams that illustrate the reasons behind a particular event that were made by Kaoru Ishikawa in 1968. The Ishikawa diagram is often used to identify the sources of an overall effect in product design and quality fault avoidance. Every imperfection's cause or source offers diversity. To discover these sources of variance, causes are typically

divided into broad groups. For this study, the data is further analyzed to find the root causes of project delay to fulfill the objective of the study.

4. Findings

Table 1, presents a list of 25 ABC Company projects from 2019 to 2021 that had a marked delay, indicating that the project was not completed on the anticipated or contractually required date.

Table 1: Project Delay and Causes for Company ABC

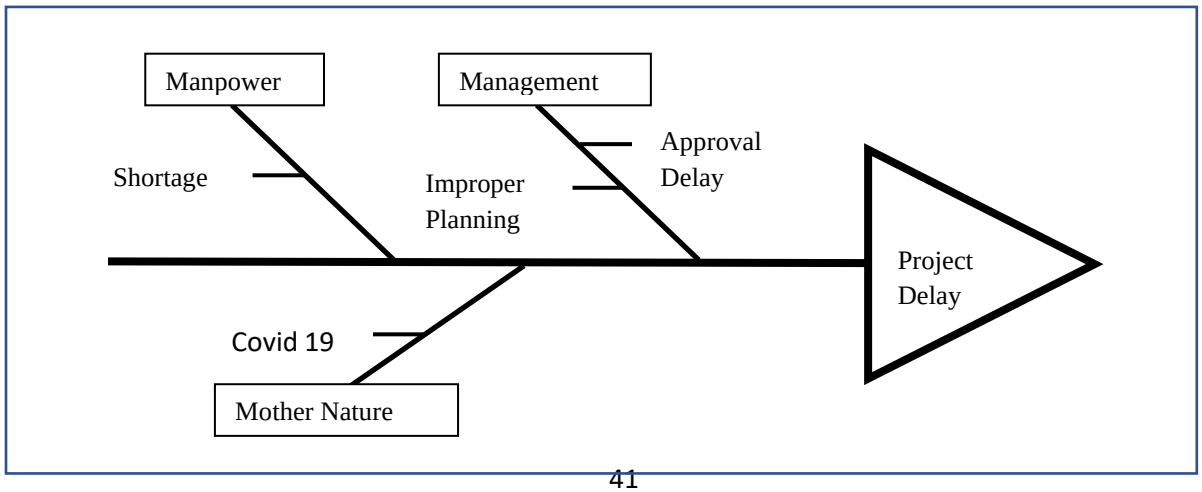
Types of projects	No of delays	Cause of delay	Causes frequency
Distribution Pipe Replacement	11 times	1. Approval from the local authority for digging and road closure	5 times
		2. Delayed work tender and authorization	3 times
		3. Different project scopes issued	2 times
		4. Late progress report submission	1 time
Valve and sensor replacement	7 times	1. Delayed work tender and authorization	4 times
		2. Incorrect product specification	2 times
		3. Late progress report submission	1 time
Leakage and pipe pressure maintenance	5 times	1. Shortage of vendor's manpower	2 times
		2. Lockdown	2 times
		3. Approval from local authority	1 time
Distribution Pump replacement	2 times	1. Product delivery delayed due to lockdown	2 times

An analysis of the causes of delays is performed so that this matter can be monitored more effectively and help the Project Control Team make more accurate forecasts so that the project can be delivered on time.

Root causes of delay

A further investigation was made to determine the real reason that triggered the cause of delay. The information is analyzed from various records on the projects that have been marked delayed. The researcher examines all the records accessible to establish the root causes for the delay. The process of determining the underlying reasons for unfavorable occurrences and preventing them from recurring in the future is known as root cause analysis (Yap et al., 2021). The root cause is the most profound underlying reason (or causes) for any process's positive or negative symptoms that, if addressed, would result in the elimination or considerable decrease of the symptom (Hamzah et al., 2011). We have to dig the deepest to uncover most of the roots. Often, they are not the closest, most evident, or most direct reasons. They usually exist i). The structure at three, four, or five layers deep (Ansari et al., 2019). The root causes are then recategorized into a proper group and summarized using Fishbone diagrams shown in Figure 1.

Figure 1: Fishbone diagram of root causes for project delay



Shortage of Manpower

Due to the labor-intensive nature of the construction sector, a labor shortage directly affects project performance (Mohd-Rahim et al., 2016). Many managers and supervisors mistakenly believe that a worker's size and degree of performance on the job are inversely related. Work commitments are making up a larger portion of the workload, which is typical in many organizations these days. Workload inside an organization rises when employees perform and finish more tasks than is expected of them. A staffing shortage causes an organization to have more work and less supervision.

The company won about 600 projects from 2019 to 2021. One project engineer is expected to manage 10 projects each year with the help of a team of project engineers that has roughly 20 members. Since all projects take a very long time to finish, this is seen as being quite taxing on the personnel. This problem is exacerbated by the fact that several projects that were awarded in 2021 were postponed until 2022 due to unanticipated circumstances, such as obtaining municipal approval, and were not completed in that year. The problems get worse when the team, which usually has 5 to 7 people, is reduced to 3 or 5 because there is an increase in projects during certain times. Due to the labor-intensive nature of the construction sector, a labor shortage directly affects project performance (Głuszak & Leśniak, 2015). Referring to Table 1, when the client side is experiencing a labor shortage, the situation sometimes becomes beyond the company's control. Even though it has only happened once, it is important to pay attention to the problems to reduce the likelihood that they may return at a later date.

Local Authority Approval Delay

Delays in obtaining authority approval have become a major issue for the management of the company. The COVID-19 viral pandemic is currently affecting the entire planet, which is making this issue worse and out of control. This has a big effect on how well all of the company's initiatives perform. Routine approval has taken a little bit more time thus contributing to the overall performance of the company's projects. While the number of occurrences is considered small, projects have a critical impact on the profit and the company's image which are the two most important elements of sustainability (Azli Mohd-Rahim et al., 2016). The table below compares the time taken takes to obtain each type of approval from the local authority as of October 2021.

Table 2: Forecasted and actual period of acquiring approval from local authorities

Type of Approval	Forecast Duration	Actual Duration
Minor Work Permit	Min: 56 days Max: 70 days	Min: 20 days Max: 156 days
Building Layout	Min: 70 days Max: 140 days	Min: 31 days Max: 180 days
Approval to Plan and Design Layout for Building	Min: 117 days Max: 140 days	Min: 88 days Max: 172 days

From table 2, it displays the anticipated and actual length of the local authorities' approval process. The number of working days needed to process the approval guidance and release from the local government is used as the minimum projected duration. However, it will take less time to approve a project if it has already been approved in the past. A small percentage of projects are new and take longer than expected, increasing the number of working days needed for approval and approving a small number of projects after the allotted number of working days has passed. The project management team must find a solution so that the delay in getting authority approval to carry out the project cannot negatively impact the project and does not become a recurring issue in project management, even though it is impossible to control the delay in getting authority approval to carry out the project. This is because project management success is measured in terms of three main objectives: time, cost, and technical results (Haseeb et al., 2011). Failure to plan the correct time for project completion forecasting will hurt an organization's performance, particularly in organizations whose operational nature is project management (Głuszak & Leśniak, 2015).

Improper Planning

The manner the company's project managers conducted themselves demonstrates this problem. It may be challenging for them to spend time working in the office and interacting with other teams since they have too many projects to manage. They routinely visit the job site to keep an eye on their projects, based on observation. As a result, they had little opportunity to establish more effective communication, and these chances were lost. There may be four to five projects operating concurrently for a project manager over four to six months. Sometimes a more important project will receive considerably more attention, which causes errors and delays for other initiatives. This can be seen from Table 1 where 11 projects were delayed due to different product specifications, late submission of progress reports, and delayed work tender progress. Time is essentially critical for success in project management and the burden on the one in charge may help to jeopardize the issue (Mofleh, 2021).

Additionally, some of them must go a great distance from the Kuala Lumpur office because the company's project encompasses the entirety of Malaysia. Project managers should step in at this point to keep the executive engineers and site supervisors motivated to complete their work. The team's assignments were made according to first come, first served, which required some employees to go to other states two or three times each week when it might have been given to someone already overseeing the project in that area to cut down on travel time and eventually decrease costs. The majority of the projects were unexpected, therefore without appropriate preparation, their job may not be productive, and their current workload may cause them stress. This is also being commented on by (Haseeb et al., 2011) which essentially emphasizes that planning is essential for a business that manages multiple tasks at once. They must consider the complexity of the execution, not just the project's scope but also the associated activities.

Covid19 Pandemic

The COVID-19 pandemic has affected all sectors of society, sparing no one and permanently altering how we live, interact, and work (Gara et al., 2022). While some of us now work from home or telecommute, others have lost their jobs and faced protracted layoffs. In one way or another, we have all felt the devastating impact of businesses collapsing because of unstable economic conditions. For project managers, COVID-19's consequences on operations have been catastrophic. Reliance on remote work has hampered the collaborative tactics that are commonly employed in a traditional team setting (Haas & Markovič, 2021). Lockdowns and border closures have significantly interrupted supply chains, while project management and corporate operations have become riskier (Alenezi, 2020).

Due to two key factors, the Covid-19 lockout has had a significant negative impact on the business. The project that was started has been suspended, which is the first factor. This indicates that all processes were put on pause and all actions ceased, regardless of the project's stage. The failure to finish the projects also shows that project delivery and progress payment are inevitable. This will influence both the contractor and the project owner. Due to lockdowns, all projects were at a standstill making the supply chain of the network completely halted (Yin et al., 2022b). The second reason is the suspension of all incoming projects. Contractors and clients are waiting to see how long the lockdown will last because of this uncertainty (Gara et al., 2022). Even though the organization only had a few active projects at the time, losing a future project is still considered a missed opportunity. The impact was not only felt during the lockdown; when it was lifted and normal operations resumed, problems including a lack of face masks or other facial coverings caused further delays. The completion date has been delayed due to material shortages for the projects and the affected border control strategy.

5. Conclusion and Implications of the study

Determining the root causes of project delays has profound implications for both companies and nations. For companies, addressing these causes is crucial for mitigating financial impacts such as increased costs and penalties that arise from extended timelines. By identifying inefficiencies and systemic issues, companies can streamline operations, enhance productivity, and improve resource allocation, ultimately boosting profitability and operational efficiency. Additionally, understanding the root causes helps safeguard a company’s reputation, as persistent delays can damage client trust and stakeholder relationships (Yin et al., 2022b). Improved project management practices foster better employee morale by reducing the stress associated with

delays, which in turn enhances overall productivity. Furthermore, a thorough analysis of delays strengthens risk management strategies, helping companies anticipate and mitigate future risks more effectively.

On a national level, project delays can significantly impede economic growth, particularly when they involve critical infrastructure or development projects. Efficient project execution is vital for supporting economic activities and enhancing national competitiveness. Delays in public projects, such as those related to transportation or healthcare, can negatively affect the quality of essential services and infrastructure, impacting public well-being. By resolving the root causes of these delays, nations can ensure the timely delivery of crucial projects and improve the overall investment climate, attracting both domestic and international investors. Moreover, addressing delays reflects positively on government efficiency and governance, leading to better public sector performance and contributing to strategic development goals (Głuszak & Leśniak, 2015). In essence, tackling project delays helps both companies and nations achieve their objectives more effectively, fostering overall progress and development.

Conclusion

According to the report, there are four main reasons why projects are delayed for the company: a lack of labor, a delay in receiving approval from the local government, poor planning, and the COVID-19 pandemic. According to the data above, delays could happen frequently in every construction project and turn into the most frequent problems that have detrimental effects on the organization and its participants. A construction limitation will have an impact on the three main project components of cost, scope of work, and time, which will result in a low productivity rate. To assist the teams in completing a project successfully, the project management process includes the monitoring and controlling phases. This study also effectively showed that, even if management faced the issue of uncontrollable delays, the source of the delays could still be determined from the management side of the organization itself. As a result, it should not be left to management to inquire about uncontrollable concerns. A major and well-known corporation needs improvement measures badly if it wants to increase performance. This can benefit the business's reputation, enable it to continue to be competitive in its job, and serve as an example for consultants and contractors.

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Impact of Brand Equity and Purchase Intention on Dietetics and Nutrition Consultation Service

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Abstract: The market value of a brand is reflected by brand equity. It signals consumers' recognition and preferability toward certain brands. In a highly competitive market, brand equity becomes crucial as it can lead to customer loyalty and product resilience. Strong brand equity helps a company to stand out among competitors and can significantly influence financial performance by driving higher sales volume and profitability. As more Malaysians shift their lifestyles and become more health-conscious after the COVID-19 pandemic, the demand in the healthcare market has expanded massively. By focusing on the healthcare market, especially on dietetics and nutrition consultation services, this paper seeks to evaluate how brand equity influences consumers' intention in making purchases. Four dimensions of brand equity will be investigated, consisting of perceived quality, brand awareness, brand association and brand image. A total of 194 data were collected using the convenience sampling method in the Subang Jaya region, Malaysia. The findings of this study showed that perceived quality, brand awareness, and brand association have a positive significant impact on purchase intention for dietetics and nutrition consultation services while brand image was found to be insignificantly influencing purchase intention. This provides insight and implications for the dietetics and nutrition consultation services market and practitioners, especially in formulating their marketing strategies.

Keywords: *Brand equity, Purchase intention, Dietetics, Nutrition consultation services, Healthcare market, Marketing strategies*

1. Introduction

In a highly competitive market, brand equity becomes a crucial differentiator for businesses. A company requires strong brand equity to retain customers. How consumers perceive a brand, put trust in its quality and have higher preferability towards one brand over another are significant factors in business. A product with higher recognition has a higher value in the market. It will give a company a significant advantage as it could intensify its financial performance, especially in terms of sales volume, profitability and market share. Building and maintaining brand equity is crucial for long-term success and competitive advantage in the marketplace (Kellar & Lehmann, 2009; Sohaib et al., 2022; Shi, 2022). Brand equity is often regarded as an essential element in shaping a consumer's inclination towards a specific brand, hence influencing their purchasing decisions. A robust brand possessing substantial brand equity has several advantages, such as enhanced profitability, the possibility for brand expansion, effective communication, increased consumer preferences, and heightened purchase intentions (Le-Hoang et al., 2020).

As Malaysians become more health conscious, the market for healthcare and wellness products is growing at a rapid pace in this country. According to The Sun (2023), due to the Covid-19 pandemic, 79% of Malaysians have become more aware of their health. While FurleyBio (2023) reported that the retail sales for vitamins and dietary supplements in the Malaysian market have increased substantially from RM940.4 million in 2005 to RM7.481 billion in 2022. As more and more people embrace a proactive approach to their well-being, shifting their lifestyle to be more active and healthier, and seeking more dietetics and nutrition consultation services, the industry continues to respond with diverse healthcare product offerings. With more industry players, the market competition will be bigger. When it comes to healthcare products, a well-established brand will likely be more trusted by consumers particularly one that they can assure of its safety, effectiveness, and reliability.

Henceforth, brand equity plays a crucial role in enhancing a product's market value. Strong brand equity helps a brand to establish trust and assurance among consumers. There is no research on the dietetics and nutrition consultation services industry from the aspect of consumers' purchase intention in Malaysia. The findings from

this paper would be beneficial for the industry players and healthcare marketers to understand the market better and to assist them in formulating marketing strategies to strengthen their brand equity and product recognition. To achieve this objective, this paper seeks to evaluate how brand equity influences consumers' intention in making purchases for dietetics and nutrition consultation services. Four dimensions of brand equity will be investigated consisting of perceived quality, brand awareness, brand association and brand image.

2. Literature Review

Brand Equity and Purchase Intention

Mat et al. (2020) defined purchase intention as the extent of customer's willingness to spend their money to buy goods and services which depends on internal and external factors. One of the factors that gained interest from many scholars is brand equity. In marketing, brand equity is an important concept that reflects how consumers perceive the values of goods or services. It is the recognition that a brand gains due to its market worth (Rungsrisawat & Sirinapatpokin, 2019). Previous studies showed brand equity has a strong influence over purchase intention (Rizwan et al., 2021; Senthilnathan & Tharmi, 2012; Ashil & Sinha, 2004). However, brand equity does not only relate to how consumers think, feel and act towards a brand. Scholarly articles also emphasize how brand equity brings both tangible and intangible benefits to a company, along with consumer loyalty, product pricing, profitability and market share (Mikul & Mittar, 2023; Wood, 2000; Foroudi et al., 2018; Jeon, 2017). Various dimensions of brand equity have been studied by past researchers. Through comprehensive literature reviews, Shariq (2018) has identified 11 essential dimensions of brand equity. The 11 brand equity dimensions highlighted were 1. Quality 2.Associations 3. Loyalty 4. Awareness 5.Image 6.Personality 7.Attitude 8. Trust 9. Satisfaction 10.Esteem 11.Attachment. However, the significant impact of the dimensions varies among different studies.

Brand Association

Brand association is connected to brand equity because it improves the understanding and awareness of a brand (Rungsrisawat & Sirinapatpokin, 2019). According to Chakraborty (2019), brand association describes how consumers view their connections with a brand. It includes any information that consumers think of when they hear or see a brand name based on their experiences, knowledge and interactions with the brand. Brand association becomes important in marketing because consumers are inclined to choose brand names that they associate with positive product features and attributes. Rizwan et al. (2021) stated that if consumers associate a health brand with being natural and effective, they are more likely to purchase products from that brand, believing the products will be beneficial for their health. Lee et al. (2019) also found a positive link between brand association and purchase intention. However, customers' association with a brand can only be developed once they are aware of the brand (Dada, 2021).

Brand Awareness

Brand awareness indicates the extent to which individuals become aware and familiar with certain brand names (Ramadhan et al., 2020; Chakraborty, 2019). It happens when consumers recognize and can remember a specific name of a product or service. Brand awareness is related to purchase intention as it conveys significant information about a brand in a customer's perception. Customers exclusively purchase brand names that are familiar to them, and they are only familiar with brands that they perceive as being of high quality (Rizwan et al., 2021). Advertising or promotional strategies are often used in the market to distinctly create a positive image of the brand in the minds of consumers. According to Nurhayati and Hendar (2020), brand awareness assists customers in purchase decision-making, especially when they are having difficulty in deciding to buy products or services that offer a similar quality. Rahmi et al. (2021) and Supiyandi et al. (2022) found a positive influence between brand awareness and purchase intention where a higher purchase intention can be influenced by a higher brand awareness. However, Azzari and Pelissari (2020) found that brand awareness alone does not directly affect purchase intention, instead, its impact becomes significant only when mediated by three other brand equity dimensions: associations, loyalty and perceived quality. They concluded that brand awareness is important as the initial step in creating brand value for consumers. In addition, Rizwan et al. (2021) found that brand awareness is positively related to purchase intention for health takaful products in the United Arab Emirates.

Brand Image

Brand image refers to a set of connections (Chi et al., 2020) and mental representations (Benhardy et al., 2020) that consumers have in their minds about certain brands. These were created by experiences and interactions consumers had with the brand (Kotler, 2001). Stronger favorable exposures that are retained in customer memory will create a stronger brand image and hence brand equity (Chi et al., 2020). Previous studies on the effect of brand image on purchase intention however showed mixed results. Pandey and Srivastana (2017) found that brand image contributed the highest value to the purchase intention of healthcare products where consumers considered it as the priority. Cuong (2022) also found a positive relationship between brand image buying decisions and rebuying intentions. However, Saputro and Setyaningrum (2023) indicated that brand image did not affect purchase decisions. The study highlighted the impact of brand image in influencing purchase decisions weakened in a pandemic situation as compared to other variables.

Perceived Quality

Perceived quality refers to a consumer's overall impression of a brand of goods or services that shows how effectively a brand meets customers' wants, expectations and requirements (Lee et al., 2019; Padhy & Sawlikar, 2018). Garrido-Morgado (2016) stresses that consumer's perception of product quality is a cognitive factor that influences their purchasing decisions, making them more likely to buy the product with superior characteristics. A highly perceived quality product enhances the perceived value of a brand, while a low perceived quality product can damage the reputation of a brand (Vera, 2015). In the healthcare industry, perceived quality is regarded as a crucial element of brand equity (Chahal & Baha, 2010). In fact it is the strongest factor that influences consumer's intention in making purchase decisions (Qiyu Yu, 2023; Lee et al., 2019). As consumers become more health-conscious, they seek products that not only promise efficacy but also deliver on quality.

Hypotheses of the study are developed as follows:

H1: Brand association has a positive effect on purchase intention for dietetics and nutrition consultation services.

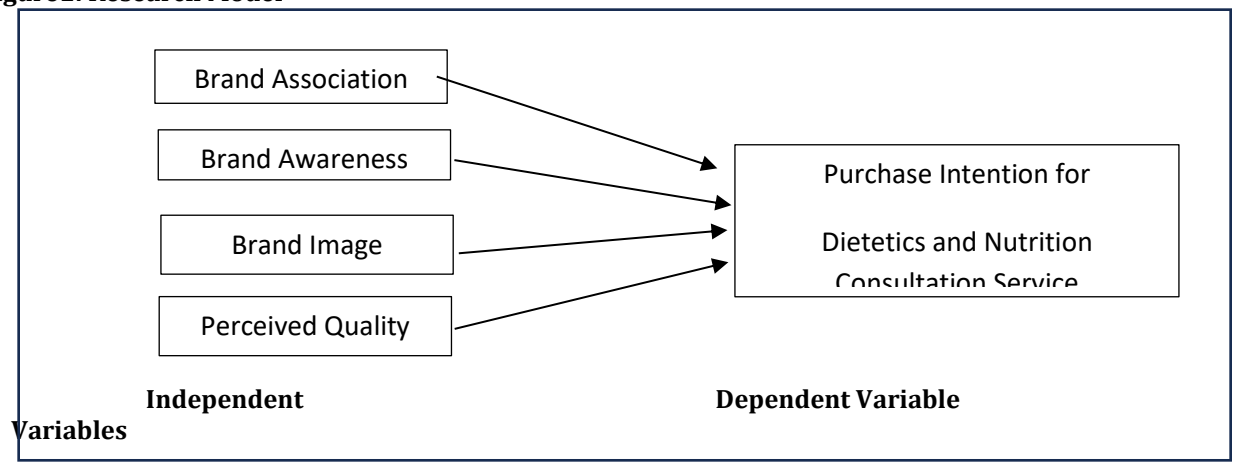
H2: Brand awareness has a positive effect on purchase intention for dietetics and nutrition consultation services.

H3: Brand image has a positive effect on purchase intention for dietetics and nutrition consultation services.

H4: Perceived quality has a positive effect on purchase intention for dietetics and nutrition consultation services.

The research model of the study is presented in Figure 1 below. The four dimensions of brand equity examined are: brand association, brand awareness, brand image and perceived quality. These dimensions are the independent variables in this study. Whereas the purchase intention for dietetics and nutrition consultation services is the dependent variable.

Figure1: Research Model



3. Methodology

This is a quantitative cross-sectional study. Data was collected using the convenience sampling method through an online survey in the Subang Jaya region, Malaysia. The minimum sample size required of 119 was calculated using G*Power 3.1.9.7 (Faul et al., 2007) with an effect size of 0.15 and power of 0.95 for 3 predictors. A total of 194 respondents have participated in the data collection process. As the data were collected based on a single source, common method bias Kock and Lynn (2012), and Kock (2015) were assessed using the Full Collinearity test as shown in Table 1. As the VIF is less than 5 indicates single source bias is not a serious issue with our data.

Table 1: Full Collinearity Test

Variables	VIF
Brand association	3.301
Brand awareness	2.902
Brand image	3.804
Perceived quality	2.805
Purchase intention	2.634

Measurement items for constructs used in the questionnaire were adapted from previous studies. Five items to measure brand awareness were adapted from Rungsrisawat and Sirinapatpokin (2019) and Foroudi (2018); six items to measure perceived quality were adapted from Rungsrisawat and Sirinapatpokin (2019), Foroudi (2018) and Zhou (2021); four items to measure brand association were adapted from Rungsrisawat and Sirinapatpokin (2019), Pourazad (2019) and Karulkar (2021); seven items to measure dietetics purchase intention were adapted from Rungsrisawat and Sirinapatpokin (2019), Foroudi (2018) and Konuk (2018).

Data analysis was conducted by applying the Partial Least Square Structural Equation Modelling (PLS-SEM) technique. The PLS-SEM analysis consists of a measurement model and a structural model. The measurement model assesses reliability, convergent and discriminant validity, while the structural measurement tests the developed hypotheses.

The demographic characteristic analysis results are presented in Table 2. Approximately 60% of the respondents are female and a majority of them are within the age range of 18 to 30 years old. Almost 80% of them were from the B40 group. Half of the respondents work in the private sector.

Table 2: Demographic characteristic analysis

Variable	Frequency (n = 194)	Percent (%)
Gender		
Female	112	57.73%
Male	82	42.27%
Age		
18 to 30 years old	138	71.13%
31-40 years old	20	10.31%
41-50 years old	19	9.79%
51-60 years old	13	6.70%
61 years old and above	4	2.06%
Race		
Malay	159	81.96%
Chinese	17	8.76%
India	13	6.70%
Others	5	2.58%
Monthly Income		
Less than RM 4,849	152	78.35%

RM 4,850 - RM 10, 959	34	17.53%
RM 10,960 and above	8	4.12%
Occupation		
Government Sector	15	7.73%
Private Sector	106	54.64%
Self Employed	13	6.70%
Students	42	21.65%
Others	18	9.28%

4. Data Analysis

The PLS-SEM technique was used to assess the effects of brand awareness, perceived quality, brand association, and brand image on purchase intention for dietetics and nutrition consultation services. Normality test examined using WebPower power analysis, the multivariate Mardia's skewness (β = 5.987, $p<0.001$) and kurtosis (β = 48.037, $p<0.001$) indicating non-normality of data can be applied using PLS-SEM technique.

The measurement model analysis results of convergent validity of loadings, average extracted (AVE) and composite reliability (CR) are presented in Table 3. The outer loading values≥, CR values ≥ 0.7 and AVE values ≥ 0.5 support the convergent validity.

Table 3: Measurement Model

Variable	Item	Loading	CR	AVE
Brand association	BAS1	0.829	0.914	0.727
	BAS2	0.874		
	BAS3	0.845		
	BAS4	0.862		
Brand awareness	BAW1	0.708	0.910	0.590
	BAW2	0.804		
	BAW3	0.82o		
	BAW4	0.781		
	BAW5	0.729		
	BAW6	0.748		
	BAW7	0.783		
Brand image	BI1	0.848	0.931	0.692
	BI2	0.818		
	BI3	0.851		
	BI4	0.799		
	BI5	0.827		
	BI6	0.846		
Perceived quality	PQ1	0.682	0.917	0.650
	PQ2	0.753		
	PQ3	0.869		
	PQ4	0.860		
	PQ5	0.880		
	PQ6	0.771		
Purchase intention	PI1	0.645	0.894	0.551
	PI2	0.644		
	PI3	0.599		

PI4	0.741
PI5	0.867
PI6	0.829
PI7	0.825

Furthermore, discriminant validity was measured using the Heterotrait-Monotrait ratio of correlations (HTMT) criterion (Henseler et al., 2015) and the HTMT values were greater than 0.85 (as shown in Table 4). The convergent and discriminant validity results indicate that measurement items are valid and reliable.

Table 4: HTMT Criterion

	Brand association	Brand awareness	Brand image	Perceived quality
Brand association				
Brand awareness	0.844			
Brand image	0.877	0.819		
Perceived quality	0.767	0.744	0.835	
Purchase intention	0.791	0.763	0.777	0.802

The structural model was assessed using a bootstrapping procedure with 10,000 re-samples (Ramayah et al., 2018) for path coefficients, t-values, p-values and confidence intervals. The results of the structural model are shown in Table 5.

Table 5: Hypothesis Testing

Hypothesis	Std. Beta	Std. Dev.	t-value	p-value	PCI LL	PCI UL	f^2
H1: Brand association -> Purchase intention	0.230	0.091	2.521	0.006	0.078	0.38	0.044
H2: Brand awareness -> Purchase intention	0.239	0.076	3.141	0.001	0.113	0.36	0.055
H3: Brand image -> Purchase intention	0.137	0.091	1.508	0.066	-0.008	0.288	0.013
H4: Perceived quality -> Purchase intention	0.277	0.101	2.745	0.003	0.112	0.445	0.078

The R^2 value of 0.620 indicates that 62% of the variation of purchase intention for dietetics and nutrition consultation services is explained by 4 predictors in the study. The path coefficient results shown in Table 5 indicate that brand association ($\beta = 0.230$, $p < 0.01$), brand awareness ($\beta = 0.239$, $p < 0.01$), and perceived quality ($\beta = 0.2773$, $p < 0.01$) were found to be positive, which significantly influences the purchase intention for dietetics and nutrition consultation service. Thus H1, H2 and H4 were supported.

The effect size of brand association, brand awareness and perceived quality on purchase intention were small. Hypothesis H3 was not supported, which concludes that brand image has an insignificant effect on purchase intention. The predictive relevance of the model is assessed using PLSpredict (Shmueli et al., 2019). As shown in Table 6, a majority of the items' PLS-SEM RMSE values were less than LM RMSE values, indicating the model has a moderate predictive power.

Table 6: PLS Predict

	PLS-SEM		LM	PLS-SEM - LM
Item	**Q^2predict**	**RMSE**	**RMSE**	**RMSE**
PI1	0.161	0.881	0.92	-0.039
PI2	0.202	0.841	0.88	-0.039
PI3	0.196	0.859	0.816	0.043
PI4	0.322	0.813	0.889	-0.076
PI5	0.445	0.781	0.82	-0.039
PI6	0.436	0.779	0.838	-0.059
PI7	0.461	0.746	0.779	-0.033

Discussion

Three brand equity dimensions (perceived quality, brand awareness and brand association) were found to have a positive significant impact on purchase intention for dietetics and nutrition consultation services. The results revealed similar findings to previous studies (Lee et al., 2019; Rahmi et al., 2021; Qiyu Yu, 2023; Supiyandi et al., 2022). The findings agreed with Qiyu Yu (2023) and Lee et al. (2019) where perceived quality has the most influential effect. However, brand image was found to be insignificant in purchase intention for dietetics and nutrition consultation services. The result aligned with Saputro and Setyaningrum (2023) but contradicted with studies from Pandey and Srivastana (2017) and Cuong (2022).

As perceived quality refers to consumers' subjective assessment of a brand's overall excellence, consumers often associate high-quality products with better health outcomes. In the healthcare industry, perceived quality is one of the important components of brand equity (Chahal & Baha, 2010). Health-conscious consumers are more likely to be attracted and will consider purchasing dietetics and nutrition consultation services from a brand that is perceived to offer superior quality. In terms of brand awareness, where consumers are familiar and can recall a specific brand name, the result showed brand awareness to positively affect purchase intention. In the context of health care, consumers seem to feel more comfortable choosing dietetics and nutrition consultation services that they are familiar with, which eventually influence their purchase decisions. As most studies show a positive influence of brand association on purchase intention, this study also found similar results for purchase intention on dietetics and nutrition consultation services. Products associated with positive health outcomes, safe, reliable, and trustworthy attract consumers and can positively sway their purchase decision.

The result indicated that brand image did not affect purchase intention for dietetics and nutrition consultation services. Therefore the third hypothesis was rejected. In the study conducted by Saputro and Setyaningrum (2023), they reasoned that brand image was insignificant to purchase intention due to the pandemic situation where consumers considered that it was not important as compared to other variables. In this study, where other dimensions of brand equity seem to have a stronger effect, consumers may prioritize tangible aspects (product quality, product safety, efficacy, reliability, positive health outcomes) more than intangible aspects (brand image) when making a purchase decision on health-related choices. Tangible product attributes (product quality, price) were found to have a positive effect on purchase decisions (Akpoyomare et. al, 2012; Chaerudin & Syarafudin, 2021). In addition, some demographic variables (gender, age, culture, health conditions) may lead to differences in the findings. Different consumer segments may yield different contributing factors influencing purchase intention on dietetics and nutrition consultation services.

5. Conclusion and Recommendations

This study explores the influence of four dimensions of brand equity towards purchase intention for dietetics and nutrition consultation services. As Malaysians become more health-conscious and embrace healthy lifestyles, the healthcare market has expanded tremendously. With a larger market and more competitors, it is important to differentiate one brand from another and to be preferable among competitors.

As brand equity portrays the value and strength of a brand in a market, strong brand equity can lead to greater customer retention and loyalty, higher perceived value, and easier introduction to new products. This can significantly impact a company's financial performance. Thus it is important to understand the dimensions of brand equity that influence dietetics and nutrition consultation services purchase intentions. The result revealed that perceived quality, brand awareness, and brand association significantly impact consumers' purchase intentions, while the brand image does not seem to have a significant influence. This shows that brand equity is highly influenced by how consumers perceive quality and preferability towards certain brands.

The findings provide insight and implications for the dietetics and nutrition consultation services market and practitioners in formulating their marketing strategies in Malaysia particularly. The absence of a significant relationship between brand image and purchase intention for dietetics and nutrition consultation services suggests that consumers prioritize tangible or functional product attributes (eg. quality, efficacy, safety) over intangible or emotional aspects (brand image). Healthcare marketers, therefore, should tailor their marketing strategies to emphasize the tangible benefits. The focus should be more on building trust, awareness, and positive associations that could instill confidence in consumers rather than brand image and perceptions through the three significant brand equity dimensions.

Healthcare practitioners could emphasize perceived quality by maintaining or improving product quality, safety and efficacy. This could be done by highlighting clinical trials, scientific evidence, certification, or endorsement from healthcare professionals to enhance credibility and reinforce the perception of high quality. They could boost brand awareness by doing educational content, social media campaigns, advertising, and signing partnerships with healthcare providers to disseminate information on the advantages or benefits of the brand. Healthcare marketers could also focus the marketing strategy by leveraging positive brand associations. Dietetics and nutrition consultation services must positively be associated with good health and well-being. Thus, highlighting natural ingredients, sustainability and ethical practices could enhance brand reputation. Special attention must also be given to aligning brands to positive health outcomes and prevention to boost brand association.

This study enriches the theoretical foundation and enhances our knowledge of changing consumer behavior in healthcare literature. However, the healthcare industry is unique and various dimensions of brand equity that affect purchase intentions could vary based on age, culture or health conditions. Given the limitations of this research, future studies could explore these nuances to refine marketing strategies in building product brand equity in the healthcare industry.

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Assessing the Effects of Organizational Culture on the Connection Between Innovation in Organizations and Human Resource Management

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Abstract: This article examines the significance of human resource management (HRM) in innovation, organizational culture, and organizational effectiveness. The conceptual framework creation was supported by extracting information from literature research on related study topics, such as resource-based views and organizational effectiveness. This paper seeks to address the existing gap in the literature on organizational effectiveness by emphasizing the role of HRM in influencing business performance. Specifically, it focuses on the intermediate impact of HRM on innovation and culture. This research can help higher education institutions better understand how human resource policies can improve long-term performance by encouraging innovation and fostering an effective culture.

Keywords: *Organizational culture, innovation, effectiveness, HRM*

1. Introduction and background

In the current intricate and competitive job market, various elements influence an employee's choice to stay in their current vocation inside their organization. The factors that are most renowned for potentially influencing an employee's decision to remain with or go from a company are the economic environment, job satisfaction, managerial practices, organizational culture, and occupational commitment. However, this study primarily focuses on the strategic management of human resources to enhance employee innovation. In contemporary human resource management, it is necessary to synchronize organizational goals with the human resource strategy to guarantee coherence between personnel policies and management objectives. Consequently, the HR department should no longer be perceived as a mere extension of the company, but rather as a crucial component in guaranteeing the achievement of organizational objectives. The objectives of strategic management are to furnish the organization with a clear orientation and a sense of mission.

Organizational culture plays a critical role in bridging the gap between innovation and human resource management (HRM) in organizations. Here's how:

Culture as an Inhibitor or a Facilitator: Innovation may be encouraged or stifled by an organization's culture. Innovative ideas are more likely to be supported in a culture that values experimenting, taking risks, and open communication. On the other hand, a strict or risk-averse culture can hinder innovation and creativity. Harmony with the Innovation Approach: The organization's innovation goals and culture must coincide for innovation to flourish. This entails cultivating virtues like cooperation, adaptability, and never-ending learning. Developing HR Procedures: The organizational culture must be reflected in and supported by HRM procedures. For instance, if the culture values innovation, HR procedures should concentrate on finding, training, and keeping creative staff members.

Performance Management: Rather than focusing just on achieving short-term objectives, performance measures in an innovative culture may give precedence to creativity, teamwork, and the capacity to effect change. Empowerment and Autonomy: Employees' capacity for innovation can be improved in a workplace culture that grants them both empowerment and autonomy. HR can help with this by creating positions that promote creativity and by offering resources for skill improvement. Collaboration and Knowledge Sharing: Cross-functional innovation is more likely to occur in cultures that value cooperation and sharing of knowledge. HR may help with this by encouraging communities of practice and networks inside the company.

Training and Development: By offering chances for ongoing learning, HRM is essential to maintaining an innovative culture. Programs for developing creative thinking, problem-solving, and other innovative talents may fall under this category. Reward and Recognition: Employee incentives are in line with the company culture when creative conduct is

Acknowledged and rewarded, which reinforces the desired behaviors that foster innovation. Cultural Transformation: To foster innovation more effectively, a company may occasionally need to change its culture. HRM plays a critical role in managing this transition by bringing leadership together, involving staff members, and revamping procedures to fit the new culture. Employee Engagement: Increasing employee engagement through a strong, supportive culture can result in increased.

In the end, human resource management must be integrated into the overall plan to maximize staff utilization and provide organizations with better returns on investment, as indicated by ROI (Return on Investment) per unit of currency allotted to them. Organizations run the danger of not making the most use of their staff if the human resource management approach is not developed in this way. This is not a good sign for the success of the organization.

2 . Literature Review

Examining several academic research, theories, and viewpoints is part of a literature study on the subject of how organizational culture influences the relationship between innovation in organizations and human resource management (HRM). Important ideas, theoretical frameworks, and findings from empirical research will all be covered in this overview. The common attitudes, behaviors, and values that influence how people behave within an organization are referred to as its organizational culture. Schein & Schein (2019) posits that an organization's culture may be viewed as its "DNA," impacting every facet of its functioning, encompassing innovation and human resource management. Employee perceptions of their responsibilities, engagement levels, and readiness to innovate are shaped by this culture.

Organizational cultures that value transparency, adaptability, and a risk-taking attitude are said to be more innovative, according to several studies. Quinn and Cameron (2024), for example, emphasize the importance of an adaptable and flexible culture in promoting innovation, contending that these cultures inspire workers to try new things and welcome unconventional ideas. Obstacles to Innovation: Conversely, hierarchical or excessively efficiency-focused cultures might hinder innovation. According to Martins and Terblanche (2003), organizations with inflexible cultures that prioritize control and conformity tend to have lower levels of creativity and innovation. Management of Human Resources and Organizational Culture HRM as a Designer of Cultures:

HRM as a Cultural Architect: HRM is essential to establishing and preserving corporate culture. Ulrich et al (2007) suggest that HR strategies, including recruitment, training, and performance management, have a crucial role in fostering a culture of innovation. Alignment with Organizational Culture: Bowen and Ostroff's (2004) research emphasizes the significance of matching HR procedures to the culture of the company. They contend that HRM and an inventive culture work together to produce a synergistic effect that improves the organization's capacity for innovation as a whole. Mutual Reinforcement: There is a mutually reinforcing relationship between HRM, innovation, and corporate culture. Research by Damanpour and Schneider (2006) shows that HRM practices that foster innovation are incentivized by an innovation-supportive culture, resulting in a positive feedback loop.

HRM's Function in Innovation: Research such as that conducted by Sanders et al. (2018) has demonstrated the importance of particular HRM practices in creating an environment that is conducive to innovation, such as continuous learning and development. These procedures aid in fostering in workers the attitudes and abilities needed to create. Surveys and Case Studies: Through HRM, empirical research has shed light on how various organizational cultures impact innovation. For instance, Chang and Lee's 2017 study discovered that successful innovation was more common in companies with a strong culture of cooperation and knowledge sharing. In a similar vein, Chen and Huang (2009) showed that HR procedures emphasizing collaboration and employee

empowerment had a favorable effect on organizational creativity. Cross-Cultural Views: Research by Hofstede (1980) and later investigations have demonstrated that cultural variation

Cultural Inertia: Long-standing organizational cultures' resistance to change is one of the issues addressed in the literature. As mentioned by Denison, this can present serious challenges for HRM in promoting innovation (1996). The literature also discusses the question of whether organizational cultures can be successfully altered to foster innovation, with a focus on dynamic vs. static cultures. According to Kotter and Heskett (1992), deeply rooted beliefs and conventions may endure despite cultural change, making it challenging for HRM to spur innovation. Organizational culture, innovation, and HRM have a complicated and intertwined relationship, according to the literature. Innovation requires a supportive culture, and HRM practices play a critical role in creating and maintaining this culture. However, there are obstacles like cultural inertia and the requirement for culture and HRM practices to coincide.

The purpose of this study is to ascertain how employee innovation and human resources strategy are related. The process of attracting, assessing, and selecting qualified candidates for a position inside an organization is known as recruitment. Hiring is an essential managerial responsibility that guarantees the acquisition of a highly productive workforce. Finding the best candidate for a position is the essence of effective recruitment, which has a big impact on customer perception, industry reputation, workforce size, productivity, and profit. These days, hiring new staff members and their capacity for innovation have become major concerns for organizations.

Carefully examining the organization's practices—including its structures, procedures, and policies—is essential to developing a consistently inventive workforce. This happens because these practices may inadvertently make it more difficult for the business to promote innovation. For innovation to flourish, senior leaders' mere dedication to it—even when combined with an emphasis on the requisite skills and culture—is insufficient. For example, it was recorded in another case that "Many seasoned HR directors and hiring managers agree that senior staff are receiving worse treatment and bemoan the loss of their important contributions, such as organizational knowledge and the ability to mentor junior staff" (p. C1). Many companies were not designed to make innovation or change easier.

According to Elippo, training is the process of improving a worker's knowledge and abilities to carry out a certain task. On the other hand, according to Dale Yoder, training is the methodical process of providing people with the abilities and information needed to complete specific job responsibilities. According to Beach, training is a methodical procedure that people use to gain knowledge and abilities for a certain goal. To increase employee performance, training can involve learning new material, honing existing abilities, comprehending ideas, adhering to regulations, or changing attitudes and behaviors. A person's capacity to plan and carry out their goals determines their level of success in life, not just their wants. The means of getting there is more important than the final destination. In the same way, the strategy for starting something should be the main focus rather than the intended degree of success. Training is recognizing where you are right now, whether things seem good or bad, and projecting where you want to go in the future at the same instant. In addition, training describes the process of acquiring knowledge, competencies, and skills via career advancement. The process of acquiring skillful behavior is known as training. One's capacity to plan ahead and carry out their goals is what ultimately determines their success in life, not just their wants.

An employer's acknowledgment and appreciation of a worker's performance is referred to as reward and recognition. In return for their services, employees receive monetary compensation, which is referred to as this. Benefits for employees generally don't directly affect how well they work. On the other hand, inadequate benefits are linked to higher employee turnover and absenteeism as well as lower satisfaction levels. To fully use the benefits that employee benefits provide to a company, a positive feedback loop for benefit distribution must be established. AIG UK Benefits recently carried out a survey whereby it looked at how employers and employees felt about the offering and dissemination of voluntary employee benefits (VEBs). The intention was to learn more about how these perks can encourage employee engagement. The results underscored how important it is to communicate benefits packages efficiently. Benefits offered by the company to employees are known as VEBs. One hundred and fifty HR managers who actively choose and promote employee perks at their

different companies made up the research sample. Furthermore, the sample comprised five hundred individual workers who work for companies that offer both mandatory (core) and optional employee benefits.

The foundation for creating HRM procedures that are in line with strategic goals is organizational culture. Certain core skills or abilities have historically been highlighted in the body of extant strategy literature as being essential for attaining good corporate performance. Performance results are strongly influenced by organizational culture. We argue that an organization will function better when its members, regardless of hierarchical position, have common values, presumptions, and beliefs that align with its strategic goals and capabilities. According to recent research, positive organizational outcomes are correlated with high-performance work practices (5) and high-engagement work organizations (6). Outcomes like decreased termination and resignation rates and increased productivity. Results, such as higher productivity and reduced rates of quitting and firing. In general, Organizational capacities and culture encompass the concept of social capital. The overwhelming evidence suggests that social capital has a significant and beneficial impact on the performance of companies.

Three categories of HR practices have been found in the literature to help put in place an HR system that is geared toward encouraging innovation. The three main focuses are as follows: performance-based reward, which emphasizes rewarding employees for their contributions and results; team development, which entails significant development and implementation of leadership and team-based activities; and training-focused, which emphasizes skill improvement and investing in human capital. It's common knowledge that a cross-functional team is a necessary organizational structure for fostering innovation and creativity. Cross-functional teams are heavily utilized by many progressive companies (Ledford, Lawler, & Mohrman, 1995). The three sets of HR practices outlined above are often essential and play a critical role in supporting the development of cross-functional teams inside innovation-driven enterprises.

3. Conceptual Framework

A conceptual framework for assessing how organizational culture affects the connection between innovation in organizations and human resource management (HRM) can be structured to illustrate the relationships between these key components. The framework typically involves defining the key constructs, their interrelationships, and the mechanisms through which these relationships influence outcomes. Below is a conceptual framework that can be used to guide research or analysis in this area.

Conceptual Framework Components

A. Organizational Culture
Definition: Organizational culture refers to the shared values, beliefs, norms, and practices that shape the behavior of individuals within an organization.
Key Dimensions of Culture: Flexibility vs. Rigidity: The degree to which the culture supports adaptability, creativity, and openness to change.
Collaboration vs. Individualism: The extent to which teamwork, knowledge sharing, and collective problem-solving are emphasized.
Risk-Taking vs. Risk-Aversion: The organization's tolerance for uncertainty and its encouragement of experimentation and innovation.
Support for Learning and Development: The emphasis is placed on continuous learning, skill development, and employee growth.

B. Innovation
Definition: Innovation in organizations refers to the process of generating, adopting, and implementing new ideas, processes, products, or services that create value.
Types of Innovation:
Product Innovation: The introduction of new or improved products or services.
Process Innovation: The development of new or improved ways of producing goods or delivering services.
Organizational Innovation: Changes in organizational structure, management practices, or business models.

C. Human Resource Management (HRM)
Definition: HRM refers to the strategic approach to managing an organization's most valuable assets—its people. This includes recruitment, training, development, performance management, and employee relations. **Key HRM Practices:**
Recruitment and Selection: Hiring individuals whose values and skills align with the organization's innovation goals and
Training and Development: Providing continuous learning opportunities that enhance employees' ability to contribute to innovation.
Performance Management: Designing appraisal and reward systems that incentivize innovative behaviors and outcomes.
Employee Engagement and Retention: Strategies to keep employees motivated and committed to the organization, particularly those who contribute to innovation.

Interrelationships and Hypotheses
Organizational Culture as a Mediator:
Hypothesis 1: Organizational culture mediates the relationship between HRM practices and innovation outcomes. For example, HRM practices that promote flexibility, collaboration, and learning are more effective in fostering innovation when they align with a supportive organizational culture.
Hypothesis 2: A culture that emphasizes risk-taking and openness to change strengthens the impact of HRM practices on innovation by encouraging employees to experiment and embrace new ideas.

Direct Impact of HRM on Innovation:
Hypothesis 3: HRM practices directly influence innovation by developing the necessary skills, behaviors, and attitudes among employees. For instance, continuous training and performance management systems that reward innovative contributions directly boost an organization's innovation capacity.

Feedback Loop:
Hypothesis 4: Successful innovation can, in turn, reinforce and shape organizational culture and HRM practices. For example, as an organization becomes more innovative, its culture may evolve to further support creativity and risk-taking, and HRM practices may be adjusted to sustain and scale innovation efforts.
Moderating Effects of Organizational Culture:
Hypothesis 5: The relationship between HRM and innovation is moderated by the strength of the organizational culture. In strong cultures where values and norms are deeply embedded, HRM practices that align with these values are more likely to succeed in promoting innovation.

Visualization of the Conceptual Framework
The conceptual framework can be visualized as follows:
Organizational Culture
- Arrows leading to Box 2: Innovation and Box 3: HRM Practices
- Dimensions of culture influencing both innovation and HRM

Innovation
- Connected with **Box 3: HRM Practices** via a two-way arrow
- Innovation outcomes feeding back into organizational culture

HRM Practices
- Arrows connecting to both Box 1: Organizational Culture and Box 2: Innovation
- HRM practices designed to align with and support the culture, thereby enhancing innovation

This conceptual framework illustrates how organizational culture serves as a critical link between HRM practices and innovation in organizations. By understanding and managing these interrelationships, organizations can create an environment that fosters sustained innovation, supported by strategic HRM practices that align with the desired cultural attributes. Future research and practical applications can use this framework to explore specific aspects of these relationships, such as the impact of different cultural dimensions on various types of innovation, or how specific HRM practices can be tailored to different cultural contexts.

Empirical research has shed considerable light on how different types of organizational cultures influence innovation through human resource management (HRM). These studies generally focus on the characteristics of organizational culture that either facilitate or inhibit innovation and how HRM practices can support or undermine these cultural traits.

Types of Organizational Cultures and Their Impact on Innovation

Innovative Cultures: Research consistently shows that cultures characterized by flexibility, openness, and risk tolerance are more likely to foster innovation. For instance, a study by O'Reilly, Chatman, and Caldwell (1991) found companies with cultures that value adaptability and creativity tend to be more innovative. These organizations often support decentralized decision-making, which empowers employees to take initiative and experiment with new ideas.

Hierarchical Cultures: In contrast, cultures that are more hierarchical and control-oriented often struggle with innovation. A study by Zammuto and Krakower (1991) found that organizations with a strong emphasis on rules, procedures, and control tend to be less innovative. In such environments, employees may feel constrained by the rigid structure, limiting their ability to think creatively or propose novel solutions.

HRM Practices Supporting Innovation

Recruitment and Selection: Empirical studies indicate that recruiting individuals who align with the organization's innovative culture is crucial. For example, a study by Collins and Smith (2006) demonstrated that firms with a strong emphasis on collaborative culture and knowledge-sharing tend to select and retain employees who are not only technically skilled but also adept at working in team-oriented, innovation-driven environments.

Training and Development: Research by Sanders et al. (2018) shows that HRM practices focused on continuous training and development are key to maintaining an innovative culture. These practices ensure that employees acquire the necessary skills to contribute to innovation, such as creative problem-solving and interdisciplinary collaboration.

Performance Management: Empirical evidence suggests that performance management systems that reward creativity and innovation can reinforce a culture of innovation. For instance, a study by De Jong and Den Hartog (2007) found that companies that recognize and reward innovative behavior tend to see higher levels of creative output from their employees.

Knowledge Sharing and Collaborative Cultures

Role of Knowledge Sharing: Cultures that emphasize knowledge sharing and collaboration are particularly conducive to innovation. Research by Chang and Lee (2017) highlights that organizations with strong knowledge-sharing mechanisms often experience higher levels of innovation. These cultures facilitate the flow of ideas across different parts of the organization, enabling employees to build on each other's knowledge and expertise.

HRM's Role in Facilitating Collaboration: HRM practices that promote teamwork and cross-functional collaboration are crucial in such cultures. For example, Chen and Huang (2009) found that HRM practices aimed at enhancing collaboration, such as team-building activities and cross-training programs, significantly boost the organization's capacity for innovation.

Cultural Fit and Employee Engagement

Cultural Fit: The alignment between an employee's values and the organizational culture—often referred to as "cultural fit"—is critical for fostering innovation. A study by Kristof-Brown et al. (2005) found that employees who perceive a strong fit with their organization's culture are more likely to be engaged and contribute to innovation. HRM practices that assess and ensure cultural fit during recruitment and onboarding processes are therefore vital.

Employee Engagement: Engaged employees are more likely to go above and beyond in their roles, contributing to innovative processes. Research by Schaufeli et al. (2002) supports this, showing that engaged employees in

organizations with supportive cultures are more likely to participate in innovation-related activities, such as brainstorming sessions and project teams.5. Case Studies and Cross-Cultural Comparisons

Case Studies: Numerous case studies illustrate how specific organizations have successfully cultivated an innovative culture through targeted HRM practices. For example, Google is often cited in the literature as a case study of how a culture of innovation, supported by HRM practices like 20% time (where employees can spend 20% of their time on projects of their choice), can lead to significant innovative outcomes.

Cross-Cultural Comparisons: Cross-cultural studies also provide insights into how different national cultures impact the relationship between organizational culture, HRM, and innovation. For instance, Hofstede's cultural dimensions theory has been used to explore how cultural differences in power distance, uncertainty avoidance, and individualism/collectivism influence organizational innovation across different countries (Hofstede, 1980). In cultures with low power distance and high Individual organizations tend to have more innovation-friendly HRM practices, compared to those in high power distance, collectivist cultures.

Challenges and Limitations

Cultural Inertia: One of the challenges highlighted in the empirical literature is the concept of cultural inertia, where long-standing organizational cultures resist change, thereby inhibiting innovation. This is particularly evident in studies of older, established organizations that have a deeply ingrained culture focused on efficiency and control.

Balancing Innovation with Other Organizational Goals: Another challenge is balancing the need for innovation with other organizational goals, such as operational efficiency. Research by Gibson and Birkinshaw (2004) suggests that organizations must find a balance between maintaining a culture that supports innovation while also achieving operational excellence.

Empirical research provides strong evidence that organizational culture significantly influences the relationship between innovation and HRM. Cultures that are flexible, collaborative, and open to risk-taking tend to foster higher levels of innovation, particularly when supported by HRM practices that reinforce these cultural attributes. However, challenges such as cultural inertia and the need to balance innovation with other goals must be carefully managed. Future research could further explore these dynamics, particularly in the context of rapidly changing business environments and diverse cultural settings.

Managerial Implications

Pragmatically speaking, the proposed paradigm benefits higher education institutions in particular. Better organizational performance for businesses will result from fusing HRM approaches with creativity and cultural efficacy. Addressing environmental protection, developing continuously, and adapting to societal and governmental demands, will strengthen the firm's sustainability. Furthermore, the proposed paradigm provides scholars with insightful information about how HRM might enhance organizational performance through innovation and cultural efficacy. To achieve cutting-edge innovations and sustain long-term success in the ever-changing business landscape, firms must have access to human resources. The importance of innovation performance and cultural effectiveness in the relationship between human resource management is highlighted by this study.

4. Methodology

The Human Resource function is vital for any firm, regardless of management's awareness of its impact on daily activities. Human Resources plays an increasingly important function in today's organizations. It is widely known that most firms' most valuable resource is their workforce. Human Resources is the traditional functional department in charge of personnel management, and its strategic scope is expanding. Human Resource teams are now responsible for change management, succession and retention planning, continuous learning, and 360 career planning. Before implementing a strategy, Human Resources must first identify the existing obstructions to the planned improvements in their organization. Strategy implementation is a systematic process of removing internal obstacles.

Before executing a strategy, Human Resources must first identify the present roadblocks to organizational change. Strategy implementation is a rigorous process of removing internal barriers to organizational transformation. Every strategic strategy will inevitably face opposition, even if the majority agrees that change is required. Furthermore, the more drastic the shift in strategy, the more disagreement will arise. Measures and analyses.

The dependent variable was assessed using a single-item question, 'Please rate your firm's success in the area of developing new products or services over the last three years as compared to your industry's average,' on a Likert scale of 1 (poor) to 5 (very good). It's been hypothesized that It has been hypothesized that this comparative strategy is more effective in eliciting responses than explicitly asking respondents to supply exact values. A conceptual model of how the HR system influences innovation through company culture.

HR can proactively prevent many potential conflicts by anticipating and resolving some of the issues that are likely to arise. Typically, there are five primary reasons why plan implementation fails, and as a result, HR management must work to overcome around ten predictable hurdles. The primary factors and associated concerns include the organization's competitiveness, employees' ability to perform their current jobs, the cultivation and preservation of a high-quality work environment, maximizing employee job satisfaction and self-fulfillment, and conducting a SWOT analysis to identify external opportunities while taking into account the associated risks and threats. This is the rationale for conducting research: to discover the scope of the problem and viable remedies.

The methodology component of a study examining how organizational culture influences the relationship between innovation in organizations and human resource management (HRM) should include the research design, data-gathering methods, sample tactics, and analytical methodologies. This section describes an organized approach to exploring the proposed research questions or hypotheses.

Research Design

The research design defines the overall approach to the study. Given the complexity of the relationship between organizational culture, innovation, and HRM, a mixed-methods approach is recommended, combining both qualitative and quantitative research methods. This approach allows for a more comprehensive understanding of the phenomena under study.

Qualitative Component: Exploratory, this component seeks to understand the nuances of how organizational culture influences innovation through HRM practices. It may involve case studies, interviews, and focus groups.

Quantitative Component: This component aims to measure the relationships and test the hypotheses derived from the literature review. It may involve surveys and statistical analysis to determine the strength and significance of the connections between variables.

Research Questions and Hypotheses

The research will be guided by specific research questions and hypotheses, such as:

RQ1: How does organizational culture influence the effectiveness of HRM practices in fostering innovation?

RQ2: What specific dimensions of organizational culture are most strongly associated with innovation in organizations?

H1: There is a positive relationship between a culture of collaboration and the effectiveness of HRM practices in promoting innovation.

H2: HRM practices are more effective in fostering innovation when aligned with a culture that supports risk-taking and flexibility.

Data Collection Methods

a. Qualitative Data Collection

Case Studies: Select organizations known for their strong innovative cultures and successful HRM practices. These organizations will be studied in-depth to understand how culture shapes HRM and innovation.

Interviews: Conduct semi-structured interviews with key stakeholders, including HR managers, innovation leaders, and employees. Questions will explore how they perceive the influence of organizational culture on HRM and innovation.

Focus Groups: Organize focus groups with employees from different departments to gather diverse perspectives on the impact of organizational culture on their ability to innovate.

b. Quantitative Data Collection

Surveys: Develop and distribute a structured survey to a larger sample of organizations. The survey should include validated scales to measure organizational culture (e.g., the Organizational Culture Assessment Instrument), HRM practices, and innovation outcomes.

Secondary Data: Use existing data from organizational reports, employee performance records, and innovation metrics (e.g., number of patents, and new products launched) to complement survey findings.

Sampling Strategy

Qualitative Sampling: Purposeful sampling will be used to select organizations that represent different types of organizational cultures (e.g., innovative, hierarchical) and varying degrees of innovation success. The sample should include organizations from diverse industries to capture a broad range of cultural and HRM practices.

Quantitative Sampling: A stratified random sampling method will be employed to ensure that the survey sample is representative of different organizational sizes, sectors, and regions. The target population will include HR professionals, innovation managers, and employees across various levels within the organization.

Data Analysis

a. Qualitative Data Analysis

Thematic Analysis: Analyze interview transcripts, case study notes, and focus group discussions to identify key themes related to the influence of organizational culture on HRM and innovation. Coding will be used to categorize the data into themes, and patterns will be identified to draw meaningful insights.

Content Analysis: Apply content analysis to any textual data, such as organizational documents or interview transcripts, to quantify the frequency of specific cultural attributes or HRM practices mentioned about innovation.

b. Quantitative Data Analysis

Descriptive Statistics: Summarize the survey data to describe the sample characteristics and distributions of key variables such as organizational culture dimensions, HRM practices, and innovation outcomes.

Correlation Analysis: Use Pearson or Spearman correlation coefficients to explore the relationships between organizational culture variables, HRM practices, and innovation metrics.

Regression Analysis: Conduct multiple regression analyses to test the hypotheses and assess the impact of specific cultural dimensions and HRM practices on innovation outcomes. This analysis will help determine the strength and significance of the relationships. Structural Equation Modelling (SEM): If appropriate, SEM can be used to test complex relationships between latent variables (e.g., culture, HRM, innovation) and to validate the conceptual framework proposed.

Ethical Considerations

Informed Consent: Ensure that all participants understand the purpose of the research and provide informed consent before participating in interviews, focus groups, or surveys. Confidentiality: Maintain the confidentiality of all participants and organizations involved in the study. Data should be anonymized to protect privacy. Bias and Reflexivity**:** Acknowledge and Mitigate any potential biases in data collection and analysis. Reflexivity will be practiced, particularly in qualitative research, to consider how the researcher's background and perspectives might influence the study.

5. Conclusion and Limitations of the Study

Generalizability: The findings from qualitative case studies may not be generalizable to all organizations. However, they will provide deep insights into specific contexts. Response Bias: Survey respondents may exhibit social desirability bias, particularly in self-reporting organizational culture or innovation practices. Mitigating strategies, such as anonymizing responses and triangulating data sources, will be employed. Complexity of Culture: Measuring organizational culture is inherently complex, and capturing its full impact on HRM and innovation may be challenging. Multiple data collection methods and robust analysis techniques will be used to address this issue.

This methodology outlines a comprehensive approach to assessing how organizational culture affects the connection between innovation and HRM. By combining qualitative and quantitative methods, this research aims to provide a nuanced understanding of these relationships, offering valuable insights for both academic research and practical application in organizations.

Conclusion

The relationship between corporate culture, innovation, and human resource management is complex and interrelated. A culture that fosters creativity is required, and HRM procedures must be adjusted to reflect and promote this culture. When HRM properly supports an innovative culture, it fosters creativity and new ideas, resulting in long-term competitive advantage.

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A Review of Tiktok Livestreaming Commerce

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Abstract: In recent years, live-streaming commerce has witnessed remarkable global growth, catalyzed in part by the COVID-19 pandemic. TikTok, originally a video-sharing app, has undergone rapid expansion and now offers livestreaming capabilities. This review aims to explore how TikTok livestreaming is reshaping the marketing landscape. The objective is to uncover the advantages of TikTok livestreaming for various stakeholders, shedding light on its potential implications for marketers, customers, and content creators. A comprehensive examination of existing literature was conducted, analyzing studies, reports, and academic papers. The analysis focused on the multifaceted benefits of TikTok live streaming for marketers, customers, and content creators. It also considered practical implications for businesses utilizing this platform. TikTok livestreaming fosters real-time engagement between marketers and customers, leading to enhanced trust and more effective product demonstrations. It appeals to younger demographics, offering a valuable marketing avenue. For customers, it facilitates interactive, informative, and emotionally engaging shopping experiences. Content creators can leverage TikTok live streaming to monetize their content and deepen connections with their audience, enhancing brand exposure. In conclusion, TikTok livestreaming is reshaping e-commerce by facilitating immersive, interactive, and trust-building experiences for marketers, customers, and content creators. Marketers should focus on quality interaction, product presentation, and partnering with suitable content creators. Collaborations with influencers should consider credibility and alignment with brand values. Leveraging TikTok's livestreaming capabilities offers the potential to cultivate customer loyalty and retention, transforming conventional marketing paradigms in the process.

Keywords: *TikTok, Livestreaming Commerce, Social Commerce, Content Creators, Marketing, Generation Z.*

1. Overview of Livestreaming Commerce

In the past few years, the growth of live-streaming businesses has helped create new ways for people all over the world to share information. Wongkitrungrueng and Assarut (2020) have defined live-streaming commerce as shopping that involves live streamers by using real video and real-time chat and commonly occurs on e-commerce platforms. The worldwide spread of the coronavirus disease known as COVID-19 is thought to be a contributor to the skyrocketing trends in the use of live-streaming commerce (Jahrir and Tahir, 2020). According to Statista (2024), China consumers are the most active in live commerce, with a projected market size of 5.86 trillion in 2024 (Ganbold, 2024), with Douyin and Taobao having the biggest gross merchandise volume. According to Statista, livestreaming commerce sales in the United States are predicted to reach $50 billion in 2023, and by 2026, revenues from live shopping are expected to climb by 36% (Chevalier, 2024). The live-streaming business model is also beginning to succeed in Southeast Asia. Live streaming sales in Southeast Asia will grow more than tenfold to US$13 billion in 2022, with the most active audiences coming from Vietnam, Thailand, and Singapore (Ignatius, 2022).

The above statistics have shown that livestreaming commerce has become a rapidly growing phenomenon in today's world. As a result, many online merchants are launching livestreaming selling channels using internet platforms and social media to cater to customers' desires. Live streaming commerce has the potential to take advantage of customers' "see-now-buy-now" mentality, it has emerged as a fundamental common marketing medium in the modern marketplace (Lo et al., 2022). Consumers who participate in live-streaming commerce, as stated by Lin et al. (2022), have a chance to engage and interact with one another through the use of chat rooms and discussion boards. According to Xu et al. (2020), live-streaming commerce gives customers the possibility to view, comment on, and even buy things as the broadcast happens in real time. Established e-commerce selling platforms like Alibaba, Amazon, and Taobao have all already begun to incorporate live-streaming commerce into their operations. Starbucks and Samsung have also added live-streaming features to their websites to facilitate online sales and marketing. Social networking sites (SNS) have also joined the battle,

which has resulted in the creation of an entirely new form of e-commerce known as social commerce (Wang et al., 2022). This form of e-commerce uses social media to complete an e-commerce transaction known as livestreaming selling (Wongkitrungrueng and Assarut, 2020).

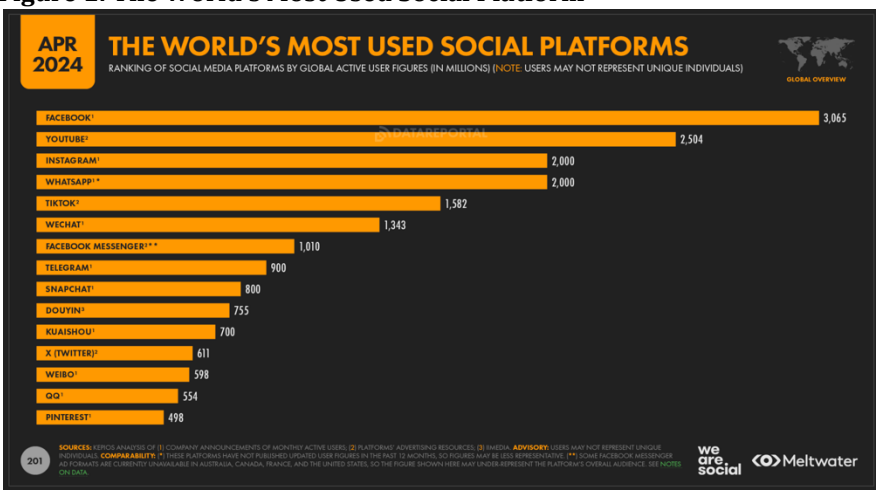
E-commerce live streaming differs from social commerce live streaming. It is noted that e-commerce live streaming usually happens on e-commerce platforms that have a live streaming function, and the initial idea these platforms have been developing is for selling products (Yan et al., 2023). Social commerce livestreaming, on the other hand, often takes place on social media platforms that were initially designed for live streams but later incorporated commercial activities (Yan et al., 2023). These platforms were designed primarily for social networking and entertainment purposes, not to sell products. Regarding product display, time efficiency, shopping experience, and sales strategy, live-streaming commerce has significant advantages over traditional e-commerce (Li et al., 2021). As a cutting-edge business strategy that facilitates direct communication and interaction between suppliers and customers, live-streaming commerce is an essential platform for vendors (Lee & Chen, 2021).

TikTok is one example of a social media platform that was initially developed for live streams but later incorporated commercial activities. Thus, this paper aims to review the usage and benefits of TikTok. The following section will discuss the uses and benefits of TikTok livestreaming.

2. Overview of TikTok

TikTok is a video-sharing application that allows users to create and share short videos on any subject they desire. The Chinese start-up company ByteDance released the application in September 2016 (D'Souza, 2023). The app was formerly known as Musical.ly before it changed its name to TikTok (Sharabati et al., 2022). As a result of the COVID-19 outbreak, TikTok's popularity has increased because more people are using their mobile devices to explore new methods of interacting with others, conducting business, and making purchases (Pongratte et al., 2023). After the epidemic, TikTok quickly became the social network with the highest growth rate (Barta et al., 2023) and the social media and video platform with the greatest number of users all over the world. TikTok climbed to become the fifth most popular social network globally in April 2024, according to a DataReportal report with 1.58 billion active users (see Figure 1).

Figure 1: The World's Most Used Social Platform

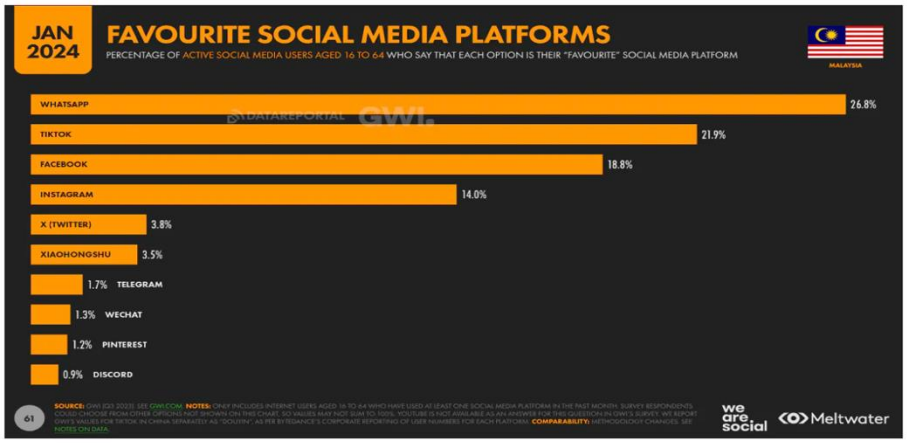


Source: DataReportal (Digital 2024 Global Overview Report)

In addition, based on Statista 2024 statistics, Indonesia emerged as the country with the largest TikTok audience as of July 2024, with about 157.6 million members utilizing this well-known social media site. The United States, with about 120.5 million users, comes in second, followed by Brazil, with 105.3 users (Ceci, 2024). It should be noted that China is left out of the statistics because Chinese consumers access TikTok through the Douyin app, which is also owned by ByteDance and has over 755.5 million daily active users

(Winter, 2024). In Malaysia, as shown in Figure 2, TikTok is the most popular social media site, with 21.9% of users loving its fascinating short-form video content, according to the Global Digital Report 2024, which was produced in partnership with Melwater and We are Social (Howe, 2024).

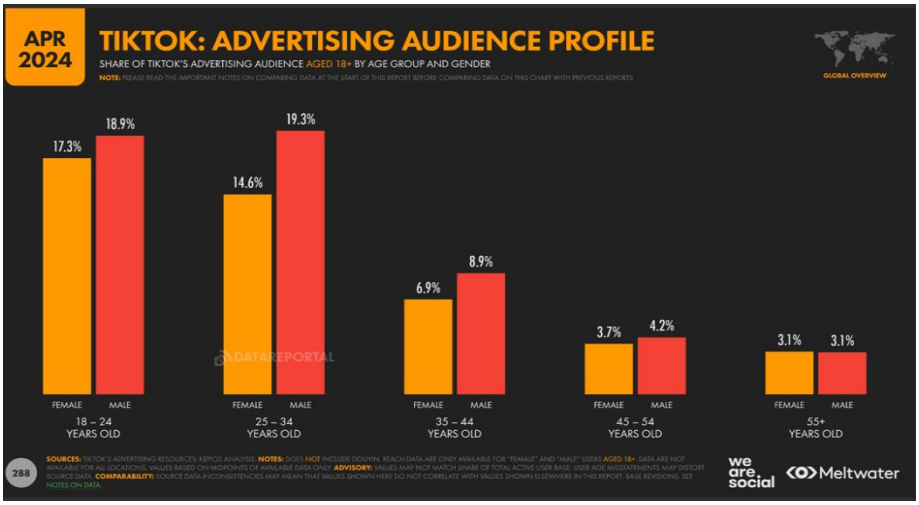
Figure 2: Favorite Social Media Platform in Malaysia as of January 2024



Source: DataReportal (Digital 2024: Malaysia)

According to data from Statista (2024), women made up about 45.2% of TikTok's global user base, whereas male users on the popular social video platform accounted for 54.8 percent of the total (Ceci, 2024). A statistic by DataReportal (2024) has shown that in terms of the age demography of TikTok users, it is evident that the TikTok advertising audience profile is primarily dominated by users from Generation Z, which is 36.2% (see Figure 3).

Figure 3: TikTok: Advertising Audience Profile



Source: DataReportal (Digital 2024 Global Overview Report)

Figure 4: TikTok Advertising Audience Overview



Source: Data Reportal 2024. (Digital 2024 Global Overview Report)

Furthermore, according to the DataReportal in Digital 2024 Global overview report, TikTok has overtaken all other social media in Malaysia as it has emerged as the most widely used platform in Malaysia (refer to Figure 4). The data shows there are 28.68 million Malaysians who could have the potential to get exposed to advertising in TikTok. Through this data, we can conclude that the TikTok platform is effectively capturing the substantial attention of the majority of Malaysian internet users. It also shows that TikTok has become an important social media network in Malaysia that can be pursued by marketers as part of their digital marketing strategy by tackling different demographic profiles of consumers.

3. Overview of TikTok Livestreaming

In 2021, TikTok introduced a live-streaming shopping function that enables real-time, two-way contact between buyers and sellers (Parahiyanti et al., 2024). TikTok initially focused on short video content but later expanded its capabilities to include online commerce, enabling viewers to make purchases while watching live streams (Ahmadi and Hudrasyah, 2022; Hua and Chiu, 2022; Luo et al., 2022). From the perspective of this article, which will discuss TikTok livestreaming, what exactly is the definition of TikTok livestreaming? According to Chillingworth (2024), TikTok livestreaming can be defined as a feature on the TikTok platform that enables content creators to engage directly with their audience by hosting live-streamed sessions, and through it, content creators can answer the audience's comments and questions. Additionally, Mileva (2024) defines TikTok livestreaming as a real-time product demonstration that allows TikTok users to purchase products directly within the app, eliminating the need to leave the platform.

In addition to this, TikTok live streaming provides its streamers and sellers with the ability to present their products to customers in the form of real-time video while also giving buyers access to further information (Wongkitrungrueng and Assarut, 2020). Live video streaming on TikTok allows users to interact in real time with their followers through comments, and it can also help users monetize their accounts by receiving "gifts" from their live-stream audience (Geyser, 2020). During live streaming on TikTok, prospective customers can enquire about the details of the showcased products by posing questions to the streamer or vendor in the comment section. Customers have the option to request the vendor or streamer to showcase the goods, demonstrate their texture, and provide an evaluation of their performance or outcomes. In addition, the platform offers promotional vouchers that clients can utilize when making purchases (Annisa and Chusjairi, 2023).

There are three (3) actors involved in TikTok live streaming: the seller, the streamer, and the customer (Huang and Suo, 2021). According to Sanjaya et al. (2023), the term seller refers to any individual or organization that offers goods and services that are going to be advertised; streamers are individuals who aid in the marketing

of a product and may also be the product's vendor; and customers are people who need to know about products and services during live streaming.

4. Benefits of TikTok Livestreaming

Ultimately, the success of live streaming shopping on TikTok will depend on how it helps the platform's users, which are marketers, customers, and content creators.

Marketers

It is important to note that TikTok livestreaming differs from typical e-commerce in that it allows consumers to engage with marketers in real-time contact. Marketers have the chance to participate in deeper conversations and foster a sense of social presence through face-to-face interactions with actual people, which will ultimately lead to an increase in consumer trust (Cha and Lee, 2022; Park and Yoo, 2022; Xu et al., 2020). For instance, during broadcast time, live streaming broadcasts or marketers may address individuals by their names and offer products that suit their interests, which can build symbolic value between store and consumer (Wongkitrungrueng and Assarut, 2020). Through this, it helps marketers to eliminate the gap between products, marketers, and consumers. Furthermore, the TikTok livestreaming feature enables marketers to showcase product usage and highlight the associated benefits, making it a distinctive platform for building consumer loyalty and trust.

Additionally, the live feature of TikTok is particularly advantageous due to its algorithm's emphasis on live content, which informs followers and boosts views (Schweitzer, 2023). This further enhances the capabilities of the live feature to facilitate consumer engagement for marketers. Additionally, live streaming has grown in importance as a promotional tool for marketers, giving customers the ability to make decisions about what to buy and fostering relationships between customers.

Next, live streaming on TikTok also enables businesses to connect more easily with huge audiences and acquire new customers. The report "Navigating the Future of Seamless in Asia Pacific (2024)" by KPMG contains data that indicates that 63% of Gen Z consider social commerce to be a significant aspect of their purchasing experience, while 57% consider livestreaming commerce to be similarly significant (Westerhout et al., 2024). In the United States, 72% of Generation Z (born between 1995 and 2015) and 88% of Millennials (born between 1980 and 1994) follow live streamers, and 88% learn about brands and items they are interested in and willing to buy through social media (Lu et al., 2021). According to data by Statista, during the first quarter of 2023, the United States also exhibited a significantly higher proportion of Generation Z customers who actively engaged in live-streaming purchasing events, surpassing other countries by a wide margin, with a participation rate of 46 percent (Chevalier, 2024). Given that they have grown up with technology and digital communication, Generation Z is far more tech-savvy and “digital natives” than previous generations (Adeola et al., 2020; Reinikainen et al., 2020; Fairistha et al., 2023). Consequently, the TikTok livestreaming platform has emerged as an exceptional choice for marketers seeking to attract younger audiences, particularly Generation Z, and to increase their brand's exposure to a diverse range of audiences.

Moreover, past researchers have recognized that live-streaming marketing can generate opportunities for impulsive buying decisions among customers. According to Gita et al., (2024), livestreaming selling and impulse purchase are closely related because of limitation of time during broadcast may create urgency for consumers to purchase. The phenomenon of impulse purchase behavior has been extensively researched in marketing studies over the past few decades, encompassing both offline and online contexts. This research has been driven by the advancements in digital payment, e-commerce, and social business (Abdelsalam et al., 2020). An impulse purchase refers to the act of consumers making unplanned purchases in response to external stimuli without having any prior purpose to acquire a certain product or category (Beatty and Ferrell, 1998). Previous studies have identified several factors that contribute to impulse purchase decisions in livestreaming. This includes scarcity-induced promotion (Yi et al., 2023), discounts and bundle offers (Gita et al., 2024), anchor characteristics such as attractiveness, professionalism, and interactivity (Li et al., 2024), the exterior design of the live platform (Gong et al., 2020), and the interface design of the live streaming platform (Yang et al., 2022). According to Statista data from 2022, more than half of TikTok users made impulse purchases, making TikTok users a social media user group that is most susceptible to impulse buying (Gelder, 2023).

Furthermore, TikTok livestreaming can aid small business marketers because it is a highly strong marketing tool for them (Vasilisa, 2023). According to Vulcan Post, TikTok Shop Malaysia experienced a 78% increase in the number of small and medium-sized businesses (SMEs) that signed up between January and June 2023, the company's one anniversary. This platform might be a low-cost marketing tactic for small firms that want to target specific demographics without investing in expensive production equipment. Small-scale individual sellers may find live selling more cost-effective as it only requires a camera, microphone, internet connection, and streaming platform. TikTok livestreaming also provided an opportunity for small businesses to help their brands get recognized by customers and improve their reputation. Small business marketers have the opportunity to reveal their identities in real time during live-streaming sessions. Customers may assume that a seller is less likely to engage in fraudulent behavior when they can see the vendor's face, gain an understanding of how the seller conducts business, and build brand awareness. Building brand awareness can assist small businesses in fostering consumer trust and cultivating a loyal customer base (Cox, 2022).

Customers

Next are the benefits of TikTok livestreaming for customers. Through TikTok, and live streaming, face-to-face interactions between customers and marketers will affect customers' physical, social, and emotional cues, which in turn influence their purchasing decisions (Gao et al., 2021). During livestreaming, customers may also ask marketers questions about products via chat, and marketers can instantly respond with answers and solutions tailored to the specifics of these requests. On top of that, TikTok livestreaming also has a feature that allows customers to have real-time interaction with other customers through the chat function. The process of exchanging information through interaction leads to an effective purchase decision (Sanjaya et al., 2023). Some customers might have prior experience using the products, and when they share their experiences, electronic word-of-mouth (WOM) activities will also increase.

Content Creators

TikTok livestreaming will also benefit content creators. Bloggers, writers, influencers, artists, podcasters, and streamers are all examples of content creators (Tafesse and Dayan, 2023). Influencers connect with customers and sell products online through live broadcasting. It is gaining popularity and importance in the online influencer economy (Lee and Theokary, 2021). According to Florida (2022), content creators are those who use digital tools to produce and disseminate original works of art, including but not limited to video, film, art, writing, games, and so on, to receive feedback from viewers. Creators of digital content have a wide range of interests, including fashion, travel, technology, music, food, health, and many more (Valsesia et al., 2020). They create content based on their interests, passions, and experiences and monetize it on digital platforms (Bhargava, 2022) via endorsement, digital tips, brand partnerships, advertising, and other forms of digital payment. Content creators' relationships with their followers typically deepen as a result of the content they share. This has become a significant draw for marketers and advertisers seeking to form partnerships with content creators to promote their products on digital platforms (Pahwa, 2023). According to Johnson et al. (2022), certain individuals refer to content creators as "contempreneurs" because of their entrepreneurial skills. With TikTok's recent introduction of live streaming, creators now have more options than ever before.

The goal of brands of all sizes is to increase exposure for their products, and one effective strategy is to form partnerships with influential content creators who already have sizable fan bases. For content creators, their work becomes a source of income, allowing them to pay for their salaries as well as those of their employees (Tefesse and Dayan., 2023). According to information provided by Melissa Yuen, TikTok's country manager for Malaysia, Singapore, Indonesia, and Taiwan, in an interview with Vulcan Post, top creators can earn up to RM20,000 per month, or RM60,000 on good months, by live streaming for an average of 2.8 hours per day (Tan, 2023) on TikTok LIVE. TikTok livestreaming serves as a prompt feedback channel, particularly during product launches. Creators can generate immediate sales by offering time-limited deals during a live event.

5. Practical Implications

Marketers

From a managerial perspective, marketers who use TikTok live streaming have to pay attention to the quality of interaction between content creators and customers. During the conversation, the marketers should ensure the appointed content creators have engaged in both verbal and non-verbal communication. Social interaction

between content creators and customers through verbal explanation (sharing past product experiences, asking questions, and explaining products) and non-verbal (acting and emotion expressed facially) will increase viewers' trust in products (Wang et al., 2022). In addition, to gain the trust of customers, marketers should ensure the content creators of TikTok livestreaming can show their competence, ability, and integrity before customer interaction.

Moreover, watching live videos usually takes more time than browsing still pictures of products, so content creators need to keep customers engaged and reduce their boredom through the inclusion of enjoyable and entertaining activities relating to products (e.g., product demonstration shows with a sense of adventure and fantasizing) or incentives (e.g., games, flash sales). These activities have the potential to evoke positive emotions, thereby fostering affective trust in both the products and the marketers. Furthermore, companies should focus on content creator marketing expertise and strive to enhance their skills. In addition to training broadcasters, marketers should focus on identifying and selecting suitable types of broadcasters and giving them products that are appropriate for advertising based on their areas of expertise and marketing style. Such actions can help boost consumer perceptions of broadcaster expertise and service quality, which will lead to increased consumer purchase intentions.

The marketers also should monitor the way a content creator shows their goods during a livestream session. It should assist the buyer in visualizing and understanding how the product will be used in an environment similar to the actual store. As a result, marketers will recommend that content creators use enhanced video by using high-quality technology to give customers a clearer picture of the goods they are considering purchasing. Through TikTok live streaming, customers can feel more connected to the content creators and feel more like they belong on the marketer's page, thanks to rich experiences and interactions that foster a sense of friendship. It is also critical for marketers to monitor whether content creators comply with this requirement. For example, marketers can ask content creators to record and assess client comments to make it much easier for them to recognize customers and recall their preferences. Marketers can also ask content creators to request comments and votes on forthcoming products or rewards during a live-streaming broadcast. These actions generate symbolic value that has a direct effect on consumer engagement.

Finally, given the complexity of live information presentation, consumers primarily rely on visual cues to navigate the platform interface (Gong et al., 2020). Therefore, it is suggested that marketers should also pay attention to the interface design of the live streaming room. Elements of interface design in a live streaming room include product display methods, interface colors, and interactive panels (Yang et al., 2022). Research indicates that the brighter the color of the live-streaming interface, the easier it is for consumers to generate emotional arousal, such as excitement which leads to impulse purchase decisions (Yang et al., 2022). Therefore, marketers should devise inventive and captivating content layouts to capitalize on consumers' impulse purchase decisions during live streaming. Given the characteristics of the young generation that dominates the TikTok platform, marketers should pursue creating a more "fresh" live streaming room.

Content Creators

First, to effectively capture consumers' attention and boost customer purchase intention or impulse purchase, content creators need to focus on showing their attractiveness, similarity, professionalism, and interactivity to consumers in the process of live broadcasting. To cultivate favorable impressions from consumers, content creators can create a unique live-streaming style based on their strengths in areas such as appearance, personality, and background. Additionally, analyzing the common characteristics of the viewers in the live-streaming room enables the content creators to display more targeted similarities with consumers and to increase the consumers' trust and favor, which will then promote buying. For instance, if the target viewers are young women, the content creators can visually appear more fashionable, friendly, and interesting. Content creators must continue to enhance their understanding of the product's characteristics (i.e., selling points, and usage methods) and increase their professionalism in recommending the product. Professionalism also creates trust in the content creator and a stronger willingness of customers to make impulse purchases (Yang et al., 2022). In addition, they can also expand their interactions with the viewers by using product demonstrations, setting up flash sales, and distributing coupons. When answering the consumers' questions, content creators can share personal or industry views, experiences, and stories to enhance the appeal within the live-streaming scenario and drive the purchase of products.

Furthermore, content creators on TikTok live streaming must closely monitor the interactions between consumers during live streaming chat sessions to promptly understand and satisfy their needs, as well as guide products. Moreover, content creators should fully showcase their knowledge and skills related to the product, providing additional information and evidence to support consumers' purchase decisions, thereby encouraging them to purchase more products. Finally, content creators must establish a positive emotional bond with their consumers. Emotional trust plays a vital role in cultivating long-term customer relationships and fostering loyalty (Zhou and Tong, 2022), which contributes to enhancing brand reputation and lays the foundation for long-term live-streaming e-commerce business success.

Last but not least, as we notice, TikTok livestreaming provides an opportunity for marketers to promote their products by seeking the assistance of content creators such as celebrities and online influencers. When celebrities post a message, it will inspire followers to buy products since customers are prone to mimicking celebrities' actions (Djafarova and Bowes, 2021). The creators of content must convince marketers to use this potential. Some consumers are more likely to believe celebrities and influencers when it comes to hearing what they have to say about a business, and content creators can use this to their advantage by influencing the purchasing decisions of their followers. The influencer, for instance, will be able to demonstrate the product in real time and respond to customer inquiries instantly. Marketers, on the other hand, will be able to improve sales, increase awareness, and reach larger target audiences by leveraging information provided by influencers or celebrities.

It has been suggested that brands looking for content creators, such as influencers, to endorse their products should not only consider the candidates' external appeal but also their intrinsic nature as well as the fit between their expertise and the product (Park and Lin, 2020). This should be taken into account when evaluating the credibility of influencers and the marketing campaigns they generate. Collaboration with those involved in scandals, in particular, should be avoided because it may negatively affect consumer opinions of brands (Campbell and Farrell, 2020). Furthermore, many endorsements by the same celebrity can reduce the effectiveness of celebrity endorsements, particularly when consumers view celebrities as being involved in too many product endorsements at one time (Yan et al., 2023). As a result, while seeking collaborations, brands should take these factors into account.

Finally, brands sometimes partner with influencers based on popularity rather than demographic alignment, which leads to suboptimal campaign results (Linh, 2023). Therefore, marketers should carefully select influencers who have a proven track record of engaging with the target age group. For instance, if an influencer has a strong track record of engaging Generation Z, marketers should consider collaborating with them as they possess the expertise to create authentic and relatable content strategies for this demographic.

Conclusion

This article review discusses the nature of live streaming on TikTok, and as a result, some new insights have been presented. From the perspectives of customers, marketers, and content creators, respectively, the benefits of TikTok live streaming have been analyzed. When we consider the benefits that come with selling their products and services, we can see that marketers may leverage the TikTok livestreaming commerce platform into their business operations. Finally, live streaming on TikTok is not only meant for marketing products and services, but it is also a new approach for business organizations to form relationships with customers, which will further create customer loyalty and retention. The emergence of new technologies in the modern age has impacted the way businesses connect with their customers. This proved particularly noticeable in electronic communication. The level of rivalry among companies has also risen because of these companies' hunt for novel and innovative ways to broaden their consumer bases. The advent of TikTok live streaming has opened a fresh channel for content makers. The advantages of TikTok live streaming can be utilized by content creators not just for financial gain but also for the dissemination of informative content that can provide societal benefits.

In addition, the marketing strategies of modern companies have been significantly influenced by the growing prevalence of social media, and the competition between online marketers and physical stores has been increased by the rise of livestreaming commerce on social media. Consequently, online marketers face significant obstacles in attracting new consumers in a competitive market. Nevertheless, marketers can resolve the challenges by concentrating on Generation Z, a group that is extremely engaging in social media, as

indicated in the article. It is essential for marketers to not only advertise their products but also to emphasize the value and overall experience of Generation Z, as it is essential to comprehend their behaviors and desires. Lastly, it is anticipated that TikTok livestreaming will present yet another chance to enhance society and the nation in the future.

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A Conceptual Model of the Relationship between Quality of Work Life and Employee Engagement among Telecommunication Call Center Employees in Malaysia

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Abstract: Employee engagement has been one of the deepest issues for organizations. Organizations are currently struggling to survive due to the tough current economic environment, whereas the only tool for the organization to achieve a competitive advantage is by engaging employees to foster a competitive edge in the marketplace. Previous studies discovered that employee engagement in Malaysia is still steadily improving but falling behind its neighboring countries, including Indonesia and the Philippines, with the result rising only by four points to 63%. In addition, it was revealed that our country still ranks among the lowest in the region. This study focuses on employee engagement among call centers at selected telcos in Malaysia. There are many theoretical approaches to examining the quality of work life and employee engagement. Hence, this study adopted the Spillover Theory and Self-Determination Theory to explain the relationship between independent variables and employee engagement.

Keywords: *Employee Engagement, Quality of Work Life, Call Center*

1. Introduction and Background

Employee engagement is the positive attitudes, interests, and attachment of employees toward the organization, its mission, vision, goals, and values (Mat et al., 2019). Nasreen et al. (2019) mentioned that employee engagement is a required benefit and can be a key managerial objective. The concept of employee engagement may be vital because it has many effects and includes many factors. It influences things like job fulfillment, commitment to the company, stress, task performance, and pressure (Saks, 2019). A lot of earlier research has also proved that employee engagement affects job performance. Besides, many scholars revealed that employee engagement impacts other variables for instance creativity (Ismail et al., 2019; Eldor & Harpaz, 2016).

According to Gallup (2022), State of the Workplace research showed that 60% of workers experience feeling disconnected at work, while 19% are actively detached. In Sub-Saharan Africa, 21% of employees are actively engaged at the workplace, 46% are considering quitting occupations, and 23% experience everyday unhappiness at work. Employees who are highly engaged mostly prefer to take joy in their work, maintain close relationships with their coworkers, and may be less likely to consider quitting (Bahri et al., 2020). According to Gallup (2017b), employees will show good engagement if management focuses on the basic human need for psychological engagement.

Employee engagement is directly connected to their quality of work life. Quality of work life may be preferred as working conditions, job contentment, chance for continuous growth, work-life balance, workplace stress management, organizational culture, communication, and social relationships. Quality of work life has gotten attention in recent years due to its ability to foster employee engagement and enable the attraction and retention of personnel (Ranna & Sharma, 2019; Suifan et al., 2016). Harini et al. (2019) observed a positive and statistically existing correlation between the quality of work life and employee engagement. Specifically, the researchers discovered that employees who practiced a more balanced working life presented a higher degree of engagement (Harini et al., 2019).

According to Sahni (2019), compared to other industries, telecommunications is a more rapidly growing and

dynamic sector, however, the increase puts weight on each employee because their working hours are also longer than before. The transformation of technology and services that is taking place in the telecom industry challenges every employee to move more quickly, effectively, and efficiently when carrying out tasks. To adjust the quality of work life among employees, the industry needs to play an important role by constantly being concerned and taking proactive steps, which will help each employee focus more and be able to adapt to change (Sahni, 2019).

Kotera et al., (2021) determined that the tendency to not engage when working can prevent them from achieving their goals, which in turn reduces opportunities to be productive because they do not achieve the desired results. Additionally, employee engagement rates continue to decline while working around the world, based on the results of employee engagement surveys, despite numerous journals and articles mentioning a high increase in employee engagement (Saks, 2017). An increase in workplace accidents and obstacles to organizational progress, coupled with a decline in employee morale, financial impact, and productivity, can significantly impact the organization through employee disengagement (Robotham et al., 2020).

From a practitioner's viewpoint, there is a significant gap in terms of the percentage of employee engagement scores across countries and the global average score. According to a report by Aon Hewitt (2017), for the years 2015 and 2017, there are still a few countries, including Malaysia, where employee engagement is minimal than the global average of 65 percent. Disengaging employees costs United States companies up to $5.5 billion annually (Vega, 2020). As cited by Natrajan et al. (2019), after six months, their engagement drops by 38% and can only reach 20% of their initial level even though employees are normally highly engaged at the start of their careers. Since studies among call center employees mainly focused on turnover rate or turnover intention, this study is looking into another aspect of employee development, which is employee engagement. Recent studies show that call centers are now a valuable resource in improving the customer experience. However, most employees from call centers receive high stress in the workplace environment and experience high rates of quitting (Baek & Lee, 2018).

It was anticipated that call centers in Malaysia would produce more than $15.5 million in profits for the organizations. Moreover, the high attrition rate among call center employees impeded the growth of profits as organizations were forced to pay additional operational expenses to retrain and replace new employees (Narehan et al., 2020). Based on the discussion mentioned above, this paper tries to find the answers, is there a relationship between quality of work life and employee engagement? And which factors of quality of work life predict employee engagement?

2. Literature Review

Call Center

A call center is known as a facility that handles many telephone calls, usually for customer service and technical support. The center serves as the main channel for companies to interact with their customers, solve problems, provide information, and ensure customer satisfaction. Call centers are often regarded as a fundamental factor in driving several commercial processes in the contemporary business environment. As a result, call centers play a crucial role in the global economy (Horng & Lin, 2020). They are seen as essential resources utilized by firms to maintain communication with customers and address issues referring to products and services (Nazli, 2020).

The industry's rapid expansion can be recognized as technological advancements, globalization, and shifts in customer expectations and habits (Han et al., 2020; Connell & Hannif, 2009; Hannif et al., 2008; Rameshbabu et al.,2013) by an expected 20% annually to account for about 3% of the workforce in the United States and the United Kingdom (Nag & Helal, 2017). In view of Nkonde and Phiri (2020), call centers prepare enhanced customer service through competence while expanding their market share through competence. Moreover, the 24/7 economy has created the functions and characteristics of call centers, which in turn shaped the 24/7 economy.

Further, the preferences of customers to transact business virtually using their technical devices are examples of shifts in consumer requirements and habits. Consequently, businesses have been pushed to change their

operating strategies to enable customers to conduct business wherever they are and whenever they choose, thus raising the 24/7 economy (Riekhoff, Krutova, & Nätti, 2019). The impact of differences in the consumer and business environment has caused many companies to reduce or downsize their physical locations. With this move, face-to-face interactions with customers become less frequent, making call centers the main channel for customers to communicate with the company (Nag and Helal, 2017). Therefore, customers utilize call centers primarily to settle issues they cannot fix (Nkonde et al, 2020).

Employee Engagement

Employee engagement is a critical topic in cooperation management theory and practice. On the other hand, definitions, ideas, antecedents, and consequences differ significantly (Sun & Bunchapattanadasakda, 2019). In the words of Uddin et al. (2019), employee engagement is meaningful for the survival and success of businesses. Employee engagement is described as an emotional interaction characterized by a positive attitude toward the organization's values (Sun & Bunchapattanasakda, 2019). Similarly, employee engagement is seen as critical in Human Resource Development (HRD) as a critical concept for many organizations (Lee & Eissesstat, 2018). This substance is also broadly discussed in a variety of fields, particularly industrial development, psychology, and organizational management (Wood et al., 2020). Besides, employee engagement is a multidimensional motivating notion that reveals a person's physical energy, cognition emotions, and excellent performance (Kuok & Taormina, 2017). As a result, focusing on employee engagement is needed nowadays because it can increase an organization's sustainability quality, as evidenced by favorable outcomes in prior research (Bakker & Albrecht, 2018). Intrinsically motivated employees always want to grow and develop because they are always connected to their position. Employee engagement rises because of the intrinsic link since they desire to be more active in their role (Adil & Hamid, 2019; Amabile & Pratt, 2016). Understanding the difference between motivation and engagement, as well as the relationship between the two, can help companies devise methods to maintain employee engagement levels. When companies understand how motivation drives employees and how engagement improves performance, they can develop more effective strategies to keep employees interested and committed to their jobs.

Martin (2020) conducted research that explored employee engagement in various library positions in the United States. Participants consisted of staff in a variety of positions, including user services, acquisitions, cataloging, information literacy, library technology, and support systems. There was a total of 1,100 relevant questionnaires used for testing, including 139 responses from men and 939 from women. The UWES-17 is used to determine the overall level of employee work engagement. As claimed by Martin (2022), a one-way ANOVA analysis shows that there is a difference in engagement according to gender, where women (M=4.32) statistically show more engagement or connection than men (M=3.87).

Quality of Work Life

Recently, researchers have identified QWL as employees' sense of comfort and well-being in the workplace (Hermawati, 2019; Monzani et al, 2016; Nayak & Sahoo, 2015). Afterward, industrial psychologists and management specialists generally agree that QWL is primarily concerned with promoting employee well-being. Kwahar and Iyortsuun (2018) also noted that the term QWL can vary depending on the nature of the industry and the working environment of the organization. Exactly, they described QWL in the context of the hospitality industry as a means of humanizing the work environment by improving physical work settings, remuneration and benefits, social relationships, job characteristics, management systems, and employee relations.

In the tourism field, the quality of work life is getting more and more attention. Previous research has demonstrated that various factors, including organizational attachment, leadership style, and corporate social responsibility practices, influence the quality of work life and life satisfaction of tourism workers (Ampofo et al., 2021; Kara et al., 2013; Kim et al., 2021). The well-being of tour facilitators merits special consideration. Anxiety can be caused by inherent characteristics of tour guidance, such as unstable income and future uncertainty (Chen & Chang, 2020).

Generally, numerous publications have revealed and evaluated the quality of work life (QWL) as a multidimensional model of influencing factors, as it is widely used in terms of managerial, worker behavioral, and individual performance variables (Aruldoss et al., 2021). In general, quality work life is achieved by humanizing work, whereas basic requirements demand more, which has persuaded employees to expand their

work quality (Malik et al., 2020). Quality work life has been explored as a job enrichment path and a motivating tool for significant variables of career achievement, job satisfaction and career balance regarding employee requirements (Davoodi et al., 2020).

This is consistent with empirical studies on the role of the quality of work life in relation to the concept of employee loyalty to the organization, which motivates employees and improves the best performance in the organization to increase their involvement (Park et al., 2019). Along with the request for additional research on quality work life to identify the significant aspect of employment, this study checks the closest aspect, namely the work engagement scope (Sahni, 2019).

Many studies confirm that the quality of work-life influences employees in terms of identification with the organization, job satisfaction, teamwork, effort at work, job achievement, intention to quit, resignation rate, and alienation from the organization (Aruldoss et al., 2021). Consequently, this paper acknowledges that embracing the idea of employee engagement is critical to organizational accomplishment, and organizations need to develop better strategies to foster highly engaged employees (Setyaningrum & Pawar, 2020).

Silarova et al., (2022) demonstrated that the quality of work life among nursing staff was studied a decade ago to determine whether employees were fulfilling their individual needs through experience while achieving organizational goals. Work-life balance is closely related to the emotional, physical, and mental health of employees and in turn affects organizational outcomes, work quality, and attrition rates. The main characteristics of work life include work-related factors, organizational characteristics, balance between personal and professional spheres, and professional personality (Silarova et al., 2022; Hsu, 2016).

A low quality of work life can also result in increased medication use, sleep difficulties, migraines, frustrated outbursts, depression, anxiety, nightmares, poor appetite, and job or career changes (Cha & Lee, 2022). According to studies, poor work-life balance affects social aspects and, subsequently, the quality of medical care (Souza Calliari et al., 2021). Empathy, fatigue, and traumatic stress are often linked with job satisfaction, which affects the quality of life at work. Job stress and satisfaction can also impact on a person's quality of life at work (Inocian et al., 2021).

The link between Quality of Work Life and Employee Engagement

A call center in the telecommunications industry is facing challenges in considering work and personal life, dealing with unclear work roles, and affecting individual well-being. Studies have revealed that call centers encounter significant pressure or stress due to rushed task completion and limited time constraints. Call centers also experienced work for extended periods, encountering interruptions during task completion and often lacking sufficient rest periods. High work pressure can lead to stress and emotional health issues (Curzy et al., 2020; Felstead and Henseke, 2017)

Hermawati and Mas (2017) found that the quality of work life has a positive relationship with employee engagement, and these two variables play a crucial role in influencing the relationship between global leadership and employee performance. In addition, the results of the study by Smeltzer et al. (2017) showed the influence of employee engagement on quality of life in the United States. Overall, quality of work life and employee engagement are closely related, and both characteristics influence employee performance outcomes.

Furthermore, extensive research over the years has shown the importance of quality of work life (QWL) in expecting employee engagement. Toscanodel Cairo et al. (2020), presenting insights from South America, found that organizational initiatives to improve the quality of work life had a positive effect on the level of employee engagement in a higher education institution in Colombia. Quality of work life (QWOL) is an important factor influencing employee engagement, in addition to job satisfaction, workplace interactions, freedom of choice, and continuing education (Geldenhuy et al., 2015). Therefore, it is expected that employees who receive sufficient advantages from their employer are more committed to their work. In addition, when employees have been treated equitably, with dignity, and with respect, these employees are connected at work. The character of working life raises employee engagement. From the existing literature mentioned, this is a new field to investigate, particularly from the perspective of call center employees.

H1: There is a relationship between Quality of Work Life and Employee Engagement

3. Theoretical Framework: Underpinning Theory

Self-determination theory related to employee engagement

Gagné et al. (2017) mentioned that self-determination theory encompasses a broad concept of motivation, personal objectives, and well-being in relation to engagement and motivation at work. This theory becomes the theoretical basis for studies that observe the relationship between the quality of work life and employee engagement. In self-determination theory, individuals thrive in work environments that meet their basic psychological needs. This concept is important because it shows that employees are more engaged and motivated when needs such as autonomy, competence, and social connection are met in their workplace (Olafsen et al, 2015; Ryan & Deci, 2017). In accordance with self-determination theory, a person's primary psychological requirements are autonomy, competence, and relatedness (Ryan & Deci, 2017). Self-determination theory applies to numerous fields, including business, sports, education, religion, healthcare, and interpersonal relationships (Güntert, 2015). The individual is a central reference in Self-Determination Theory (SDT), and variables such as management style and work context can either support or hinder motivation and well-being. SDT provides an evidence-based approach to motivation and involvement, so it is able to challenge conventional wisdom about motivation in the workplace and fit societal transformation by stressing individual strengths. This approach emphasizes that intrinsic motivation, such as the desire to grow and connect with others, is more effective in the long term than extrinsic motivation based solely on reward.

According to self-determination theory, all people have an essential desire to develop, grow, improve their environment, and live life with passion. People who are energetic, dynamic, passionate, curious, and creative, who take the initiative and are excited about life and its chances, function optimally. Moreover, people at the other end of the spectrum are uninterested, bored, lonely, and disengaged effects of their energy and enthusiasm for life have disappeared. Self-determination theory presents that these people have unfulfilled needs for competence, autonomy, and connectedness (Deci & Ryan, 2000).

Deci and Ryan sought to understand the results of studies in intrinsic motivation and internalization when they realized the three needs of competence, autonomy, and relatedness through inductive empirical methods. SDT illustrates the needs as necessary nutrients for healthy human functioning, which, if unmet, can negatively impact personal well-being. Therefore, SDT emerged to elucidate the three crucial elements necessary for intrinsic motivation, psychological development, and overall well-being (Deci & Ryan, 2000).

Spillover Theory Related to Quality of Work Life.

Spillover refers to the phenomenon where employees' activities, attitudes, and behaviors at work carry over into their personal lives. Sirgy et al. (2001) used spillover theory as a conceptual framework to develop a quality of work life (QWOL) measurement tool. Spillover theory suggests that employees' experiences are not only confined to the workplace but also spill over into their personal or family lives, existing in an unbounded environment. In theory, this spillover can be positive or negative (Khateeb, 2021). Positive spillover refers to the belief that positive experiences at work lead to feelings of satisfaction and achievement in one's personal or family life, and vice versa. Negative spillover occurs when a negative experience in one domain causes a negative experience in another domain, which reflects the reverse relationship between the domains. Positive spillover describes the idea that positive experiences in one aspect of life can lead to positive experiences in other aspects of life (Vijayakumar & Janakiram, 2017).

Life satisfaction can be influenced when the presence or absence of happiness in one important area of life has the potential to have a vertical or horizontal impact on other areas of life. An example of a spillover could be after experiencing a similar reaction from a superior at work, an employee becoming suddenly angry and acting hostile towards a family member. According to spillover scholars, there is a relationship or a strong correlation between the domains of work and home life, as well as between home life and work (Mauno et al., 2017).

Patel (2018) asserts that the spillover theory holds the distinction of being the most frequently utilized and cited among the several theories about work-life balance. Patel found the work and family structures as two distinct approaches that compete within the framework of spillover theory. This theory suggests that there is potential for a positive or negative association between these two systems. The nature of the relationships is

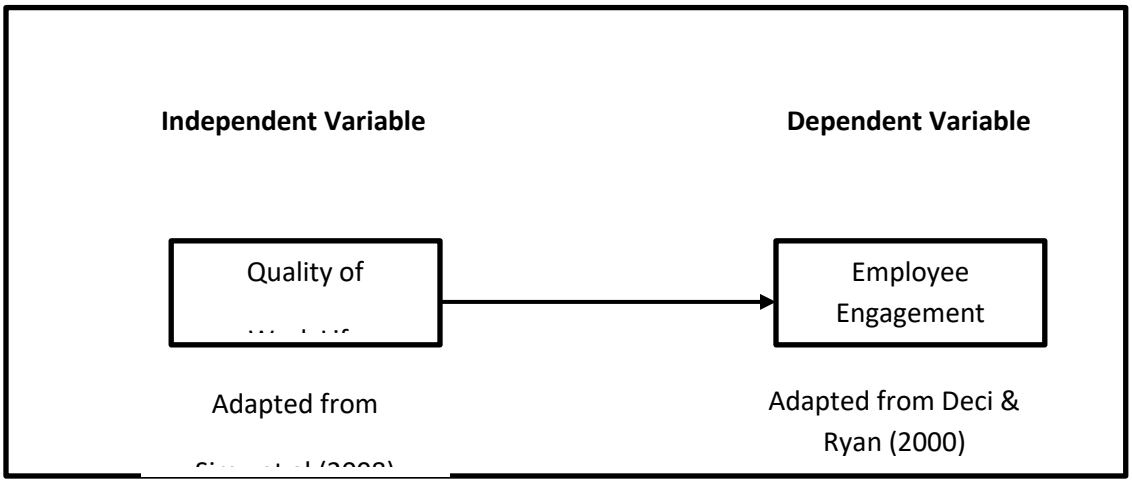
affected by moderator effects, including factors such as place, time, flexibility and energy (Patel, 2018).

To discover the spillover idea, scholars have conducted studies to examine the influence of different variables on the connection between work and home behaviors. In their study, Barber et al., (2017) employed a quantitative research approach to explore the potential mediating influences of sleep and exercise on family treatment following cases of supervisor-lowering treatment, which encompasses various negative behaviors such as employee disapproval, critical feedback, anger, and work conditions that prevent the achievement of goals. The study conducted by researchers showed a significant correlation linking supervisor undermining and home undermining.

Furthermore, it was observed that this correlation played a mediating role in subjective sleep quality. These findings suggested comparable outcomes regarding the exercise's mediation impact. The authors proposed that the adverse effects of spillovers might be effectively mitigated through the implementation of suitable interventions, such as maintaining a regular sleep schedule and engaging in a well-balanced exercise routine (Barber et al., 2017).

From the literature reviewed, the conceptual framework for The Relationship between Quality of Work Life and Employee Engagement among telecommunication Call Center Employees in Malaysia is shown in Figure 1.

Figure 1: The Relationship between Quality of Work Life and Employee Engagement



4. Conclusion

This study shows the significance of quality of work life and employee engagement. The conceptual framework reveals the direct relationship between quality of work life and employee engagement. This study wants to measure the effectiveness of quality of work life that will enhance the level of engagement among call centers in the telecommunication industry. Indeed, this conceptual paper suggested that the survey results will address issues involving between quality of work life and employee engagement in the telecommunication call centers industry. Hence, some suggestions for future research are to study other variables involved in testing the model for current issues linked to quality of work life and employee engagement.

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The Role of Leadership Styles, Work-Life Balance and The Physical Environment in Promoting Psychological Well-Being: A Job Demands-Resources Perspective

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Abstract: This conceptual paper explores the impact of leadership styles, work-life balance, and the physical environment on psychological well-being using the Job Demands-Resources (JD-R) model as the theoretical framework. In the contemporary workplace, evolving job demands, rising expectations for mental health support, and persistent stressors like job insecurity have increased the need for organizations to prioritize employee well-being. Leadership is identified as a critical mediating variable that enhances or mitigates the effectiveness of job resources, such as work-life balance and physical environment, in promoting psychological well-being. Transformational and servant leadership styles are emphasized for their role in fostering supportive work environments that buffer the negative effects of high job demands. Additionally, the paper underscores how well-designed workspaces and balanced work-life integration can significantly enhance employee well-being, contributing to higher engagement and performance. The JD-R model provides a robust lens through which the interactions between job demands, resources, and leadership can be examined. This framework offers organizations practical strategies to safeguard employee psychological well-being by fostering leadership that advocates for flexible work arrangements and supportive physical environments. Future research should empirically validate the proposed relationships to further refine the role of leadership in promoting employee well-being.

Keywords: *Psychological Well-Being; Job Demands-Resources Model (JD-R); Leadership Styles; Work-Life Balance; Physical Environment*

1. Introduction and Background

The current situation of employee psychological well-being is a mix of evolving work models, rising expectations for mental health support, and the ongoing impact of work-related stress and burnout (Salanova et al., 2021). While many organizations are making strides in addressing these issues through mental health programs, flexible work policies, and empathetic leadership, challenges such as job insecurity, poor workplace culture, and leadership failures continue to hinder employee well-being (Prasad et al., 2020). Addressing these concerns holistically and proactively is critical for maintaining a healthy and productive workforce in today's rapidly changing work environment (Tanjung et al., 2021; Rahi, 2023). The well-being of employees is increasingly recognized as a critical factor influencing organizational productivity, engagement, and long-term success. Psychological well-being encompasses various dimensions of an employee's experience, including emotional, mental, and social health, which are essential for fostering a motivated and satisfied workforce. Research indicates that psychological well-being is not merely a byproduct of job satisfaction but a foundational element that enhances employee engagement and performance across various sectors (Ausat, 2024; Kundi et al., 2020; Hanif et al., 2021).

Several factors contribute to the psychological well-being of employees, including job demands, work-life balance, and the design of physical workspaces. Occupational stress has been shown to negatively impact work-life balance and psychological well-being, particularly in high-demand industries such as e-commerce (Prasad, 2022). The blurring of boundaries between work and personal life, exacerbated by remote working conditions, has further intensified these challenges, leading to increased stress and diminished well-being (Prasad et al., 2020). Effective management of these stressors is crucial, as prolonged exposure to negative work conditions can result in withdrawal from social interactions and reduced productivity (Tsalasah et al., 2019; Presantoro, 2024).

Moreover, leadership styles play a significant role in shaping employee psychological well-being. Transformational leadership, for instance, has been linked to improved employee well-being by fostering a positive organizational climate and encouraging employee engagement (Ausat, 2024; Lindert et al., 2022). Ethical leadership and supportive workplace practices are also associated with enhanced psychological well-being, as they promote a culture of trust and open communication (Yousaf et al., 2019; Salanova et al., 2021). The presence of supportive leadership can mitigate the adverse effects of workplace stressors, thereby enhancing employee resilience and overall well-being (Ding & Yu, 2021; Rahi, 2023).

The design of physical workspaces has also been identified as a critical factor influencing employee well-being. Work environments that promote flexibility and support work-life balance contribute positively to psychological well-being (Stankevičienė et al., 2021; Alsheweir, 2023). Organizations that implement flexible working arrangements can reduce work-nonwork conflict, leading to improved employee satisfaction and commitment (Rahim et al., 2020). Furthermore, fostering a culture of organizational support and citizenship behavior can enhance job satisfaction and, consequently, employee well-being (Adnan et al., 2021).

This conceptual paper explores the influence of leadership styles, work-life balance, and the physical environment on psychological well-being, using the Job Demands-Resources (JD-R) model as the guiding theoretical framework. The JD-R model offers a comprehensive lens for examining how job demands negatively impact employee well-being and how job resources can buffer these demands. By integrating leadership, work-life balance, and the physical environment as key resources within this model, this paper aims to present a holistic approach to promoting psychological well-being in the workplace.

2. Literature Review

Theoretical Framework: Job Demands-Resources Model

The Job Demands-Resources (JDR) model is a significant theoretical paradigm in occupational health psychology that clarifies the relationship between job demands, job resources, and their impact on employee well-being and performance. Originally formulated by Demerouti et al. (2001), the model asserts that job demands are elements of employment necessitating continuous physical or mental exertion, linked to specific physiological and psychological repercussions, including stress and burnout. In contrast, job resources refer to the physical, social, or organizational elements that facilitate the attainment of work objectives, alleviate workplace pressures, and promote human growth and development (Schaufeli & Taris, 2013; Orgambídez-Ramos et al., 2014; Tooren & Jong, 2014).

The JDR model functions through two fundamental processes: the health impairment process and the motivational process. The health impairment process posits that elevated job demands may result in strain and health complications, whereas the motivational process asserts that job resources may boost motivation and engagement, ultimately fostering improved performance and job satisfaction (Schaufeli & Taris, 2013; Crawford et al., 2010). This dual-process approach facilitates an in-depth understanding of how various workplace characteristics might affect employee outcomes, including engagement, burnout, and overall well-being (Orgambídez-Ramos et al., 2014; Boyd et al., 2010; Consiglio et al., 2013).

Numerous studies have repeatedly validated the JDR model in diverse occupational settings, illustrating its relevance in forecasting employee engagement and burnout (Korunka et al., 2009; Boyd et al., 2010; Consiglio et al., 2013). Research indicates that job resources might alleviate the adverse impacts of job demands on employee health, serving as a protective factor against burnout (Crawford et al., 2010; Korunka et al., 2009; Consiglio et al., 2013). The model has been augmented to incorporate personal resources, defined as human traits that can improve an employee's capacity to manage job demands, hence deepening the comprehension of workplace dynamics (Buonomo et al., 2021; Hassard, 2024; Tooren & Jong,2014).

Additionally, the JDR model has been employed to investigate the influence of organizational characteristics, including culture and management practices, on employee well-being. A supportive organizational culture can augment job resources, thereby fostering employee engagement and mitigating stress (López-Martín & Topa, 2019; Buonomo et al., 2021). This facet of the paradigm emphasizes the significance of organizational context in influencing employee experiences and outcomes (López-Martín & Topa, 2019; Hassard, 2024). This research

examines leadership, work-life balance, and the physical environment as essential employment resources that enhance psychological well-being by mitigating the impact of working demands.

Leadership Styles and Psychological Well-Being

Leadership is essential in promoting psychological well-being among employees, primarily by creating psychological safety in the workplace. Psychological safety denotes an environment in which individuals feel secure to articulate their thoughts, undertake risks, and exchange ideas without apprehension of adverse repercussions. This notion has been thoroughly examined about diverse leadership styles, such as authentic, inclusive, and servant leadership.

True leadership significantly enhances the promotion of psychological safety. Studies demonstrate that leaders displaying authentic actions foster an atmosphere of trust and safety among their subordinates, therefore improving employee engagement and well-being (Maximo et al., 2019; Frazier et al., 2016). Maximo et al. discovered that authentic leadership actions enhance psychological safety, which is crucial for cultivating a supportive work environment (Maximo et al., 2019). The meta-analytic analysis by Frazier et al. underscores the significance of leadership in fostering an environment that promotes psychological safety, indicating that comprehending the intricacies of leadership's influence is essential for improving employee well-being (Frazier et al., 2016).

Inclusive leadership significantly contributes to the cultivation of psychological safety. Research indicates that inclusive leaders foster workplaces in which employees feel appreciated and respected, promoting open communication and risk-taking (Ye et al., 2018; Wang & Shi, 2020). Ye et al. established that inclusive leadership correlates favorably with psychological safety, hence promoting employee learning from mistakes and improving overall well-being (Ye et al., 2018). Wang and Shi emphasized that inclusive leadership cultivates a supportive environment that promotes pro-social behaviors essential for psychological safety (Wang & Shi, 2020). Selander et al. observed that engaged leadership styles, such as servant leadership, markedly improve employees' psychological safety and well-being (Selander et al., 2023).

The connection between leadership and psychological safety is corroborated by data associating both variables with other beneficial outcomes, including less turnover intention and heightened job satisfaction. Ahmed et al. have shown that inclusive leadership substantially alleviates psychological discomfort in crises, hence enhancing employees' psychological well-being (Ahmed et al., 2020; Ahmed et al., 2020). The research conducted by Sobaih et al. identified psychological safety as a mediating factor between transformational leadership and turnover intention, indicating that leaders who cultivate a secure workplace can significantly mitigate adverse effects for employees (Sobaih et al., 2022).

Work-Life Balance and Psychological Well-Being

Work-life balance (WLB) has become increasingly recognized as a vital determinant of psychological well-being among employees in diverse sectors. A substantial amount of research demonstrates that attaining a healthy equilibrium between professional and personal life markedly improves psychological well-being, job satisfaction, and overall life contentment. This synthesis analyzes the correlation between work-life balance and psychological well-being, referencing several studies that elucidate the mechanisms and effects linked to this correlation.

Work-life balance directly influences psychological well-being. Prasad's research on occupational stress in the E-Commerce sector revealed that elevated levels of occupational stress adversely affected employees' work-life balance and psychological well-being, particularly regarding autonomy and life purpose (Prasad, 2022). Yayla and İlgin indicated that work-life harmony significantly predicts psychological well-being among nurses during the COVID-19 pandemic, highlighting that individuals with superior work-life balance generally derive greater enjoyment from their work and report higher life satisfaction (Yayla & İlgin, 2021). Studies show that work-life balance enhances a sense of worth and general pleasure, which are essential elements of psychological well-being (Singh, 2016).

Furthermore, numerous research has emphasized the mediation function of good emotions in the correlation between work-life balance and job performance. Faisal et al. contend that an improved work-life balance

cultivates psychological capital and good emotions, thus augmenting job performance (Faisal et al., 2022). This concept corresponds with the observations of Yang et al., who indicated that insufficient workplace assistance may result in familial complications, hence deteriorating work-life balance and undermining psychosocial well-being (Yang et al., 2018). The relationship between work-life balance and psychological well-being is not solely a straight link; it is also shaped by emotional and social dynamics within the workplace.

The influence of work-life balance on psychological well-being is apparent in several cultural situations. Nwanzu and Babalola's research underscores the necessity for investigations in developing nations to comprehend the impact of work-life balance on psychological well-being across varied cultural contexts (Nwanzu & Babalola, 2023). This is especially pertinent as the dynamics of work-life balance can differ markedly due to cultural expectations and corporate practices. The research by Zheng et al. indicates that an imbalance between work and family life presents a more significant risk for mental health problems than work-related stress alone, highlighting the necessity for organizational initiatives to foster work-life balance (Zheng et al., 2015).

Physical Environment and Psychological Well-Being

A recent study has significantly focused on the correlation between the physical environment and psychological well-being. Urban green areas are recognized as vital components that enhance mental health outcomes. Research indicates that access to urban green parks may reduce feelings of social isolation and diminish mental health problems by facilitating social engagement and physical activity year-round (Jabbar et al., 2021; Larson et al., 2016). Larson et al. performed an extensive study in multiple cities in the southern United States, emphasizing the significance of the quality, quantity, and accessibility of urban green spaces in improving physical, psychological, and social well-being (Jabbar et al., 2021; Larson et al., 2016).

Furthermore, interaction with natural areas has been associated with enhanced emotional well-being. Marselle et al. (2013) discovered that group walks in natural areas provide superior psychological benefits relative to urban settings, indicating that nature's restorative properties significantly contribute to mental health enhancement (Marselle et al., 2013). Keniger et al. further corroborated this, observing that exercise in natural environments can enhance psychological outcomes; however, they recognized the necessity for additional controlled studies to differentiate the effects of the environment from those of physical activity itself (Keniger et al., 2013).

The design and attributes of urban green spaces are significant, as demonstrated by Braçe et al., who highlighted the necessity of planning these areas to accommodate varied user requirements, thereby optimizing their psychological advantages (Braçe et al., 2021). Furthermore, studies demonstrate that the biodiversity of green spaces can amplify their restorative effects, indicating that not all green environments have comparable benefits for psychological healing (Wood et al., 2018).

The consequences of these findings relate to urban development and public health programs. The Natural Environment Initiative, established by Harvard University, seeks to investigate the impact of natural settings on human health and well-being, highlighting the essential interdisciplinary teamwork required for effective urban design (Lee, 2017). Moreover, research indicates that children with enhanced access to green spaces exhibit a reduced likelihood of developing psychiatric illnesses in adulthood, underscoring the enduring mental health advantages of early exposure to nature (Engemann et al., 2019; Alcock et al., 2014).

3. Research Methodology

This paper is conceptual and depends on a synthesis of previous material to establish a conceptual framework. The methodology encompasses the synthesis of findings from research on leadership, work-life balance, physical environment, and psychological well-being, all contextualized within the JD-R model. The suggested paradigm discusses the interaction of these variables in affecting employee well-being, establishing a basis for further empirical investigation.

Framework Development

This conceptual framework is grounded in the Job Demands-Resources (JD-R) model, which provides a robust theoretical foundation for understanding the interplay between job demands, job resources, and their impact on employee well-being. The JD-R model suggests that job demands (e.g., workload, time pressure) deplete energy and negatively affect employee well-being, while job resources (e.g., work-life balance, leadership support, physical environment) enhance well-being and buffer the negative effect of job demands. In this study:

- Work-life balance and Physical Environment are identified as key independent variables that function as job resources. These resources directly impact Psychological Well-Being by mitigating the stress caused by job demands.
- Leadership acts as a mediator that influences the strength and direction of the relationships between these resources (Work-Life Balance and Physical Environment) and Psychological Well-Being. Effective leadership can enhance the positive effects of job resources on well-being and further buffer the adverse effects of job demands.

The JD-R model posits that employees face two types of pressures at work: job demands (which negatively impact well-being) and job resources (which help alleviate job demands and promote well-being). In this framework:

- Job Demands: High job demands (e.g., workload, emotional demands) are the main stressors that negatively affect psychological well-being.
- Job Resources: Work-life balance and Physical Environment serve as job resources that buffer the negative effects of job demands.
- Leadership mediates the relationships between these job resources and psychological well-being, ensuring that supportive leadership can strengthen the positive effects of job resources and help further reduce the negative impact of job demands.

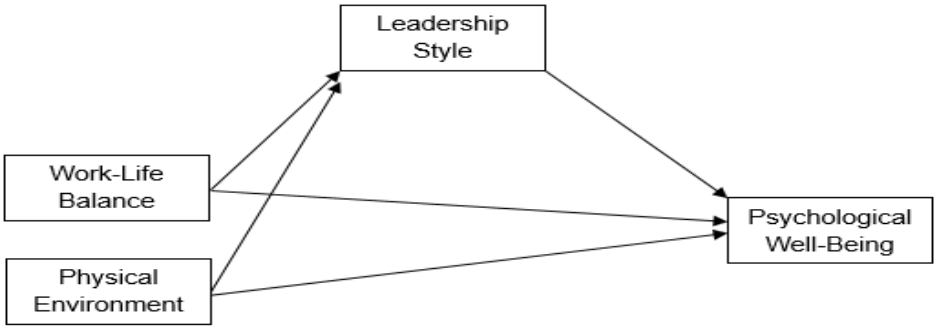
Therefore, this study proposed that:

- Leadership styles (transformational and servant) that provide job resources, such as emotional support and flexibility, will mediate the relationship between work-life balance and psychological well-being, enhancing well-being by buffering the negative effects of high job demands.
- Leadership styles (transformational and servant) will mediate the relationship between the physical environment and psychological well-being, ensuring that a well-designed physical workspace strengthens the positive impact on employee well-being, especially in high job demand contexts.
- Work-life balance will have a direct positive relationship with psychological well-being, as employees experience reduced work-related stress through policies that encourage balance between personal and professional life.
- A well-designed physical environment will have a direct positive relationship with psychological well-being by improving comfort and reducing workplace stressors, independent of the level of job demands.

This study's conceptual framework emphasizes the interrelated dynamics of work-life balance, physical environment, and leadership in shaping psychological well-being within the JD-R model setting. Leadership serves as a crucial intermediary, shaping the influence of job resources on psychological well-being by mitigating the adverse impacts of job demands. This integrative paradigm offers a thorough comprehension of how organizations can improve employee well-being via supportive leadership, work-life balance policies, and an optimally planned physical environment.

Conceptual Framework

Figure 1: Proposed Conceptual Framework



The conceptual framework discusses the interconnections between Work-Life Balance, Physical Environment, Leadership, and Psychological Well-Being. In this model, Work-Life Balance and Physical Environment function as the principal independent variables (IVs), directly influencing Psychological Well-Being, the dependent variable (DV). Leadership serves as an intermediary in these interactions, influencing the degree to which Work-Life Balance and Physical Environment affect Psychological Well-Being. The impact of these independent variables on psychological well-being may be either boosted or reduced, based on the leadership style and its effectiveness.

These are the key elements of the conceptual framework:

Work-Life Balance (IV): Defined as the extent to which employees can balance their work responsibilities with their personal lives, work-life balance serves as a resource that reduces stress and improves psychological well-being.

Physical Environment (IV): Refers to the physical workspace, including ergonomics, noise levels, lighting, and overall comfort. A well-designed physical environment promotes comfort and reduces mental and physical strain, which in turn enhances psychological well-being.

Leadership (Mediating): Leadership is positioned as a mediating variable that influences how Work-Life Balance and Physical Environment affect Psychological Well-Being. Leadership styles such as transformational and servant leadership play a critical role by providing emotional and practical support, advocating for work-life balance policies, and promoting a positive physical environment. This mediating role strengthens the effects of these job resources on well-being and reduces the negative impact of job demands.

Psychological Well-Being (DV): The outcome of the model is psychological well-being, which refers to employees' mental health, emotional balance, and overall sense of satisfaction in the workplace.

This framework aligns with modern organizational studies, suggesting that leadership is not an isolated factor but one that enhances or mitigates the effectiveness of workplace conditions like work-life balance and physical environment in promoting psychological well-being.

4. Discussion

Implications of the Proposed Model

The proposed conceptual framework provides significant insights for organizations seeking to improve employee well-being by targeting essential workplace resources. Comprehending the interrelated functions of Work-Life Balance, Physical Environment, and Leadership offers organizations a comprehensive strategy for enhancing Psychological Well-Being.

Leadership significantly mediates the impact of Work-Life Balance and Physical Environment on employee well-being. Leadership development programs must be structured to equip leaders with essential skills to cultivate supportive and empathetic workplace environments, advocate for flexible work-life balance policies that address diverse employee needs and promote the maintenance of optimal physical workspaces that enhance comfort, productivity, and mental health.

By prioritizing leadership development in these areas, organizations can enhance the impact of work-life balance policies and thoughtfully planned work environments on employee well-being. This comprehensive strategy not only improves psychological well-being but also elevates employee happiness, retention, and overall performance.

Relevance of the JD-R Framework

The Job Demands-Resources (JD-R) model offers an outstanding theoretical basis for this concept, elucidating the interaction between job resources (such as work-life balance, physical environment, and leadership) and job demands regarding employee well-being. The JD-R paradigm asserts that although job demands may adversely impact well-being, the availability of job resources can mitigate these impacts, hence enhancing well-being and engagement.

This paper enhances the JD-R framework by highlighting the significance of Leadership as a mediating variable. Leadership serves as a job resource and simultaneously improves the effectiveness of other resources, including work-life balance and the physical environment, in alleviating the adverse impacts of elevated workplace demands. Integrating leadership into the JD-R model enhances the framework's capacity to elucidate how organizations may navigate the intricate interplay between demands and resources to cultivate a psychologically healthy work environment.

This conceptual framework posits that, when bolstered by strong leadership, work-life balance regulations and physical surroundings can significantly mitigate the negative impacts of workplace demands. Therefore, organizations must prioritize the establishment of work cultures in which leadership actively endorses these job resources, so safeguarding employee psychological well-being, even under high-pressure circumstances.

5. Managerial Implications and Recommendations

Managerial Implications

Leaders significantly influence the workplace atmosphere and enhance employee welfare. Their influence transcends task management, cultivating a culture in which people feel supported, respected, and motivated. Transformational and servant leadership styles are especially helpful in fostering a corporate culture focused on well-being. Leaders may improve the efficacy of work-life balance policies by offering emotional and practical support, thereby ensuring that the physical environment promotes health and comfort. This strategy enhances employee engagement while alleviating the adverse impacts of job expectations, enabling employees to sustain elevated levels of psychological well-being even under challenging circumstances.

Work-life balance is a crucial element in employee well-being. Organizations that adopt flexible work arrangements, including remote work choices and adjustable hours, equip employees with the means to efficiently balance professional and personal responsibilities. This thus diminishes stress, enhances job satisfaction, and fosters overall psychological well-being. Moreover, providing mental health and well-being programs can alleviate the pressure exerted by elevated job demands on employees, fostering a more supportive and balanced workplace atmosphere.

The physical environment significantly impacts employee well-being. An ergonomically designed workstation with appropriate furniture, adequate lighting, and noise management boosts productivity and promotes improved mental and physical well-being. An effectively planned physical environment indicates that the organization values employee comfort and well-being. For remote employees, supplying resources to enhance home office configurations is crucial, as it directly influences their comfort, productivity, and general well-being.

Recommendations

Organizations should engage in leadership development programs that train leaders to prioritize employee well-being to cultivate leadership that enhances well-being. Transformational and servant leadership styles ought to be promoted, as they foster a helpful and empowering workplace atmosphere. Furthermore, leaders must be authorized to promote work-life balance programs and endorse attempts to establish a physical work environment conducive to both psychological and physical well-being.

To achieve work-life balance, organizations must establish flexible work practices that allow people to effectively manage their personal and professional obligations. Providing remote work alternatives, flexible scheduling, and wellness support initiatives, including mental health resources and stress management courses, will alleviate stress and enhance overall job satisfaction. These activities will foster a more supportive environment that enhances long-term psychological well-being.

Organizations should design workspaces that emphasize ergonomics, adequate lighting, and noise management to improve comfort and productivity. Equipping employees with thoughtfully planned, supportive physical work environments will alleviate workplace stress and enhance their well-being. Organizations might provide stipends or resources to remote employees to enhance their home office arrangements, so guaranteeing a favorable environment for productivity and well-being.

Conclusion

This conceptual paper has proposed a framework that integrates leadership, work-life balance, and the physical environment within the JD-R model to explain their collective impact on psychological well-being. While the propositions outlined in this paper are grounded in existing research, future empirical studies are needed to validate the framework and test the relationships between these variables. By taking a holistic approach that addresses these three factors, organizations can foster environments that promote psychological well-being, leading to higher employee engagement, productivity, and satisfaction.

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Assessing Environmental Concerns, Knowledge and Health Consciousness in Young Adults' Organic Food Choices

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Abstract: The trend towards buying organic food is declining among young adults, which raises concerns about factors influencing their purchasing behavior. This study investigates factors affecting young adults' buying behavior of organic food products, including environmental concerns, knowledge, and health consciousness. Survey data was collected from 100 young adults in Selangor, Malaysia. Multiple regression analysis was conducted to analyze the data. The results showed that knowledge about organic food was the strongest predictor of young adults' organic food purchasing behavior. In addition, concern for the environment had a significant positive influence on young adults' organic food purchasing behavior, while health consciousness showed no significant influence. These findings offer practical implications for manufacturers: to provide clear product details that can enhance consumers' knowledge and highlight environmental advantages in marketing strategies to encourage consumption. This study contributes to the literature by highlighting the value of environmental awareness and knowledge of organic food and shedding light on the minor influence of health awareness-a topic that has received less attention in other studies.

Keywords: *Organic Food, Green, Buying Behavior, Environmental Concern, Health Consciousness, Knowledge.*

1. Introduction

Organic food, i.e. agricultural products that are grown, treated and processed using natural resources and without conventional pesticides, is gaining importance worldwide. These products are free of antibiotics and contain higher levels of vitamins and proteins so fewer additional food supplements are required (Paul & Rana, 2012; Armin, Chin, & Neda, 2013). The demand for organic food in Asia has seen a remarkable growth of 20% per year (Somasundram et al., 2016; Radman, 2005), reflecting a societal shift towards healthier and more sustainable consumption patterns. Key societal drivers of this trend include increasing environmental awareness, rising health consciousness and changing lifestyles where individuals prioritize wellness and sustainability in their food choices (Marozzo et al., 2023). Consumers in Asia are paying higher prices for organic products, despite their higher costs, as they are increasingly concerned about long-term health and environmental sustainability.

In Malaysia, the consumption of organic food is increasing, driven by changing consumer behavior toward healthier food (Abdullah et al., 2022; Siti Hasnah et al., 2015; Armin et al., 2013). Malaysia's growing middle class, higher disposable income and increased environmental awareness have contributed to this change. However, according to Chen (2009), the consumption of organic food among young adults is still underdeveloped. This attitude is relatively due to the lack of awareness of organic products and insufficient environmental awareness in this population group. Furthermore, Yi et al. (2024) point out that young adults' limited knowledge of the benefits of organic food, combined with misconceptions about what constitutes an organic product, is a significant barrier for them in purchasing organic products. This is particularly important in Malaysia, where cultural factors such as traditional food preferences and the convenience of non-organic options can also influence purchasing behavior.

Young adults are an important demographic in the organic food market as their preferences can signal future trends in food consumption. As this group increasingly influences market dynamics, it is important to understand their purchasing behavior. Young adults are also more likely to be influenced by digital marketing and social media, which can reinforce or inhibit their interest in organic food depending on the available information. Therefore, investigating the factors influencing their buying decisions is key to identifying potential strategies to promote organic consumption among this group.

Despite the growing interest in organic food consumption, few studies specifically address the factors that influence the purchasing behavior of young adults in Malaysia. This study tries to fill this gap by examining how knowledge of organic food, concern for the environment, and health awareness influence the purchasing decisions of young adults, thus contributing to the understanding of this under-researched segment of the organic food market.

2. Literature Review

Environmental Concerns

Environmental concerns are linked to an individual's self-perceived responsibility for the environment. Organic food can help reduce natural pollution, protect the health of water and soil, and reduce the use of chemicals in agriculture. Alternatively, organic food products are also known as green products. Paul and Rana (2012) asserted that preserving natural resources for future generations is vital to ensure they obtain a chance to experience and use the natural resources for their use. It will also prevent diseases that might harm future generations since the more technology is enhancing and growing day to day, the more problems and diseases might increase and make the situation worse. Moreover, normal farming is not better than natural farming (Armin et al., 2013). Avoiding chemicals in food results in a higher cultivation rate, which can be achieved. Previous research has found that young adults with a high level of environmental awareness tend to buy organic food (Bagher et al., 2018; Curl, Fenske, & Elgethun, 2003). Prakash et al. (2023) emphasized that young adults' intention to purchase organic food is positively influenced by their environmental concerns. According to previous research (Yi et al., 2024; Prakash et al., 2023; Shamsudin et al., 2018; Ayub et al., 2018), young consumers' preferences for organic products are greatly influenced by their awareness of environmental issues, as they are more likely to choose environmentally friendly options when making purchases.

Asia's growing environmental consciousness, especially in reaction to pollution and industrial expansion, has made consumers more conscious of how their decisions affect the environment (Prakash et al., 2023). This shift towards sustainability is particularly evident among young adults, who are increasingly concerned about reducing their carbon footprint. The growing demand for organic products reflects the larger Asian environmental movement, which includes government programs to support sustainable agriculture. These trends are in line with changing lifestyles, where consumers are trying to balance their environmental responsibility with their consumption habits and support organic products due to their eco-friendly characteristics (Yi et al., 2024). Consistent with the literature, this study thus posits that:
H1: Environmental concern has a significant effect on young adults' buying behavior of organic food products.

Organic Food Knowledge

Organic food knowledge is associated with a person's factual knowledge of organic food and awareness as a prerequisite for developing organic food purchasing behavior. People with knowledge about organic food recognize the importance of their actions for the environment. Consumers with a low level of knowledge about organic food and a low level of education are less likely to purchase organic food because they are not aware of the benefits (Quah & Tan, 2010). Educated consumers, especially college degree holders, have the highest number of users compared with those consumers who are not educated. This suggests that greater knowledge and awareness of organic food leads to a more positive attitude and higher purchase intention. As mentioned by Paul and Rana (2012), consumers with higher education tend to have a more positive attitude. They know the health benefits of organic food and how it can change a person's lifestyle by consuming it daily and preventing diseases. Thus, the connection between organic food knowledge and education level and buying behavior toward natural food cannot be left out. In conclusion, the research that is currently available indicates

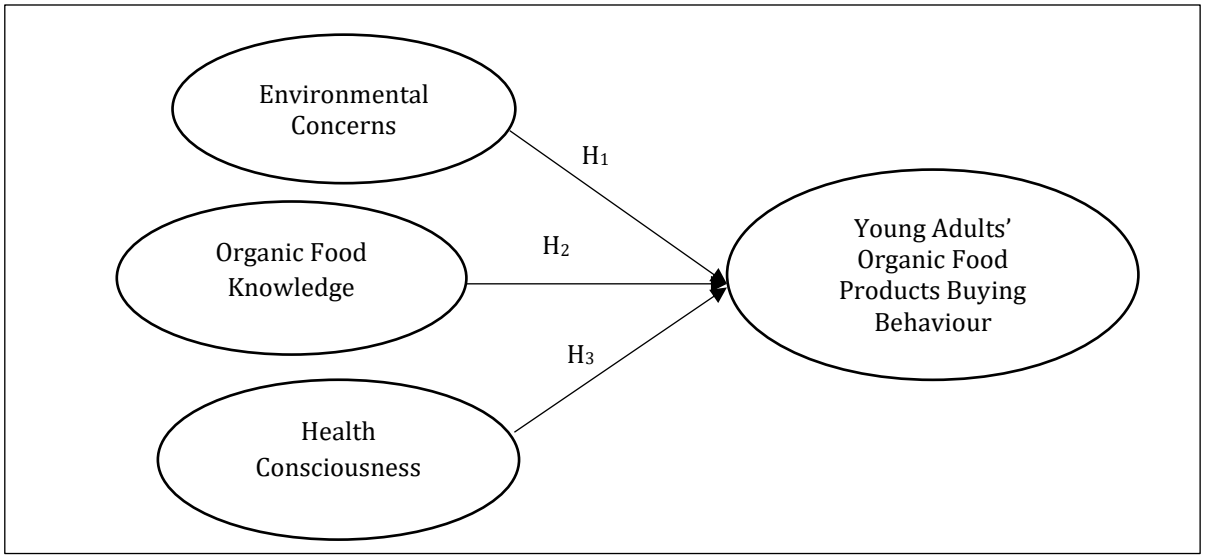
that increasing consumer awareness and understanding through education may result in more favorable attitudes and increased focus on buying organic food (Yi et al., 2024).

Similarly, growing awareness and education about organic products in Asia has had a significant impact on consumer purchasing decisions. Consumers, particularly young adults, are becoming more conscious of the sustainability and health advantages of eating organic food as more information about the advantages of organic farming and its role in environmental preservation is shared, especially through social media and government initiatives. This growing trend is in line with a broader lifestyle shift, where a health-conscious and environmentally friendly lifestyle is increasingly at the forefront. Asian consumers are becoming more discerning in their food choices and are looking for transparency in production methods and ingredients, fueling the growing demand for organic products. The hypothesis is proposed. Hence, this study put forward that:
H2: Organic food knowledge has a significant effect on young adults' buying behavior of organic food products.

Health Consciousness
Health consciousness can determine consumers who are concerned about their health and they will find ways to improve their quality of life and end their poor fitness (Parashar et al., 2019; Michaelidou, Nina & Louise, 2008). Organic food helps prevent cancer. Lockie et al. (2002) also found that consumers perceive organic products as a healthier alternative to conventional foods because they contain more nutrients that enhance personal well-being. Organic foods are also perceived as safer, better tasting and more enjoyable than conventional products (Rahman et al., 2021; Nadricka et al., 2020; Mohd Rizaimy et al., 2010; Magnusson, 2003). Moreover, the strongest motivator for people to purchase organic food is health consciousness (Huang et al., 2022; Parashar et al., 2019; Song, 2017; Nasir & Karakaya, 2014; Derk, Gerda, & Inge, 2012). They showed that health consciousness is the most important motivator influencing consumer behavior when buying organic food. Michaelidou and Hassan (2008) show that health consciousness is known to be a motivator for some consumers. Based on the positive relationship between consumers' purchasing behavior towards organic foods that are important for health, the following hypothesis is put forward.

In Asia, rising healthcare costs and concerns about lifestyle diseases have driven consumers, particularly young adults, to seek healthier alternatives to conventional foods (Huang et al., 2022). This fits into a broader trend towards preventative health care and holistic well-being, where eating organic food is thought to be safer and better. The findings of this study, however, indicate that young individuals' purchasing decisions for organic food are not substantially influenced by health awareness, despite the growing understanding of the advantages. This disparity could result from things like cost, accessibility, or mistrust of organic food claims. Consequently, the following hypothesis is proposed:
H3: Health consciousness has a significant effect on young adults' buying behavior of organic food products.

Figure 1: Proposed Theoretical Framework (Developed by authors)



3. Methodology

Sampling and Population

This study used a quantitative research design to assess young adults' environmental concerns, organic food knowledge, and health consciousness when choosing organic food. A structured self-administered questionnaire was distributed to a sample of 100 young adults aged 18 to 25 years in Selangor, Malaysia. This sample size is considered reasonable for statistical analysis, which is also confirmed by Hair et al. (2010). The structured questionnaire ensured consistency in data collection providing a reliable basis for the quantitative analysis of the variables studied.

The purposive sampling method was chosen to select participants who have an eco-friendly lifestyle and have experience purchasing green products. This purposive approach ensures that the sample accurately represents the population of interest, namely young adults who engage in environmentally conscious behavior. The study intends to offer significant insights into the elements that impact their choice to purchase organic food by concentrating on individuals having pertinent experience. This sampling technique improves the study's relevance and accuracy in determining how young adults' purchase decisions are influenced by their knowledge of organic foods, environmental awareness, and health consciousness.

Questionnaire development

There were two primary sections of the questionnaire. The demographic details of the respondents, such as age, gender, income, and educational attainment, were the main focus of Section A. These details are crucial for assessing the study's findings. Section B contained questions specifically designed to measure respondents' environmental concerns, organic food knowledge, health consciousness, and buying behavior, ensuring that all relevant aspects of the study objectives were considered.

A 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), was used to rate the questionnaire items in Section B to precisely quantify the responses received. Because it most accurately captures the intensity of the respondents' attitudes and beliefs, this scale was selected. To make sure the things were trustworthy and pertinent to the study's setting, they were modified from Chakrabarti's (2010) well-known work. The structured format and validated items contribute to the robustness of the questionnaire and enable accurate and meaningful analysis of the factors influencing young adults' organic food choices. The detailed design and rigorous customization process underline the questionnaire's ability to provide high-quality data for this research.

4. Data Analysis

The completed questionnaires were carefully examined for accuracy and completeness after being collected. After that, the data was coded and added to statistical tools for a thorough examination. The demographic information of the respondents was compiled using descriptive statistics, which provide an accurate picture of the composition of the sample. The demographic profile of the respondents is shown in Table 1. Of the total number of respondents, 82% were female and 18% were male. The majority of respondents were under the age of 22.

Table 1: Demographic Characteristics of Respondents

Variable	Frequency	Percentage				
Gender						
Male	18	18.0				
Female	82	82.0				
			Minimum	**Maximum**	**Mean**	**Standard Deviation**
Age (years old)			18	25	22.2	1.71
Personal Monthly Income (RM)			280	3600	836.67	704.59

Experience with Organic Food Products Purchases

Table 2 lists the respondents' experiences of buying organic products. Of the three types of organic food purchases listed in the questionnaire, most respondents (40 percent) stated that they preferred to buy organic vegetables, while 35 percent preferred to buy organic eggs. Respondents also bought organic chicken (25 percent). Half of the respondents have bought less than 5 times in the last six months, while 34 percent have bought between 6 and 10 times. A small proportion of respondents (15 percent) have made 11-15 purchases in the last six months. In terms of spending on organic produce purchases, 61 percent spent less than RM100 on organic produce in the last six months, 25 percent spent RM101 to RM150, while a small percentage (14 percent) spent more than RM151.

Table 2: Experiences with Organic Food Product Purchases

Variable	Frequency	Percentage
Frequency of organic food products purchased		
1-5 times	51	51.0
6-10 times	34	34.0
11-15 times	15	15.0
Types of organic food products purchased		
Organic egg	35	35
Organic vegetable	40	40
Organic Chicken	25	25
Money spent on organic food products purchased		
<RM100	61	61
RM101-RM150	25	25
RM151-RM200	9	9
>RM201	5	5

Reliability and Validity

The reliability of the constructs was tested using Cronbach's alpha. Hair et al. (2010) found that Cronbach's alpha values above 0.70 are acceptable, while values below 0.70 indicate a deficit in internal consistency. Table 3 shows that Cronbach's alpha values for all constructs are between 0.792 and 0.901 and thus exceed the cut-off value of 0.70. The results indicate a high reliability of the constructs.

Table 3: Descriptive Analysis and Inter-construct Correlations

Variables	Mean	SD	1	2	3	4
Environmental Concern	4.027	0.585	**1.000**			
Organic Food Knowledge	3.928	0.510	0.633**	**1.000**		
Health Consciousness	4.340	0.644	0.526**	0.626**	**1.000**	
Buying Behaviour	3.727	0.606	0.538**	0.597**	0.510**	**1.000**
Cronbach's Alpha			0.820	0.792	0.901	0.823

Notes: **. Correlation is significant at the 0.01 level (2-tailed); Diagonal elements (in bold) show the square root of the average variance extracted; SD = Standard deviation.

Table 3 shows that all correlations between the four factors were less than 0.700, indicating a reasonable level of discriminant validity. Knowledge of organic food was found to correlate most strongly with young adults' organic food purchasing behavior ($r=0.597$, $p<0.01$), followed by concern for the environment ($r=0.548$, $p<0.01$). The purchasing behavior of young adults for organic food is also significantly associated with health consciousness ($r=0.510$, $p<0.01$). Thus, each factor was statistically independent of the others. In addition, health consciousness had the highest mean score of 4.340 with a standard deviation of 0.644, followed by environmental concern (mean=4.027, standard deviation=0.585).

Relationships on Organic Food Buying Behavior

A multiple regression analysis was conducted to examine the factors influencing young adults' organic food purchasing behavior. Table 4 shows the results of the R2, standardized beta coefficients and t-values for the

hypothesized relationships proposed in this study. The R2 value for the dependent variable was 0.430, above the minimum value of 10% recommended by Falk and Miller (1992), indicating strong explanatory power of the model (i.e., all independent variables explained 43% of the total variance in young adults' organic food purchasing behavior). This was significantly different from zero where *F*-value= 24.125, $p<0.001$. Precisely, H1 examines whether environmental concern has a significant influence on young adults' organic food purchasing behavior. The standardized beta coefficient proves that environmental concern does indeed have a significant and positive relationship with young adults' organic food purchasing behavior ($\beta1=0.275$, $p<0.05$). This supports H1.

The following hypothesis H2 states that knowledge about organic food has a significant influence on young adults' organic food purchasing behavior. A further examination of the standardized beta coefficient shows that knowledge about organic food has a significant influence on young adults' organic food purchasing behavior ($\beta2=0.398$, $p<0.05$). Accordingly, H2 is upheld as predicted. The final hypothesis, H3, states whether health consciousness has a significant influence on young adults' organic food purchasing behavior. As shown in Table 4, the hypothesized relationship between health consciousness and young adults' organic food purchasing behavior was found to be insignificant ($\beta3=0.086$, $p<0.05$), which means that H3 is rejected.

Table 4: Relationships on Organic Food Buying Behavior

Hypothesized paths		Standardized Beta Coefficients	Results
H1	Environmental Concern → Organic Food Buying Behavior	0.275*	H1 supported
H2	Organic Food Knowledge → Organic Food Buying Behavior	0.398*	H2 supported
H3	Health Consciousness → Organic Food Buying Behavior	0.086	H3 not supported

* Statistically significant at $p<0.05$ (for *t*-value > 1.960); $R^2=0.430$; *F*-value=24.125

Discussion

This study investigated factors affecting young adults' buying behavior of organic food products. Three hypotheses were put forward in the research model. H1 states that concern for the environment has a significant influence on young adults' organic food purchasing behavior. Based on the standardized beta coefficients, the multiple regression analysis resulted in the acceptance of H1. It was found that environmental awareness has a significant influence on young adults' organic food purchasing behavior. This is consistent with previous studies (Yi et al, 2024; Prakash et al, 2023; Wang et al, 2020; Curl et al, 2003; Harper & Makatouni, 2002; Paul & Rana, 2012). Younger adults are concerned about environmental issues, they tend to opt for buying organic food products. They emphasize that the environment should be well protected by organic food production practices that use no/fewer chemicals and no/fewer growth hormones.

In addition, the correlations between knowledge about organic food and the purchasing behavior of young adults with regard to organic food were examined in H2. A closer examination of the empirical results shows that H2 is also supported as expected. The results indicate that knowledge about organic food has a significant influence on young adults' organic food purchasing behavior. This factor was found to be the strongest significant predictor of young adults' organic food purchasing behavior. The results reflect the findings of previous studies (Zhuravleva et al, 2023; Migliorini et al, 2020; Sing & Verma, 2017; Smith & Paladino, 2010). Young adults are inclined to buy organic food because they have good knowledge and information about organic food, e.g. about how much chemicals they consume. Developing knowledge about organic food helps them to develop a better understanding of the benefits of organic food for the environment. They can also learn about how organic farmers take extra care in their farming practices.

The following hypothesis H3 was used to test whether health consciousness has a significant influence on the purchasing behavior of young adults with regard to organic food. The results of this quantitative study show that health consciousness has an insignificant influence on the purchasing behavior of young adults for organic food. Therefore, H3 is not confirmed. Health awareness had no significant influence on young adults' organic food purchasing behavior, even though they know that organic food is natural and healthier than regular food because it contains no/less growth hormones, additives, antibiotics and chemical residues.

By investigating the different factors that influence the purchasing behaviors of young adults in Malaysia, a demographic that has received little attention, this study closes a gap in the body of previous research. The results challenge the commonly accepted notion that health consciousness is a significant determinant in this demographic while highlighting the significance of environmental awareness and familiarity with organic foods.

5. Conclusion

Organic food knowledge and environmental concerns were vital to impact young adults' buying behavior of organic food products. To encourage more consumption of organic food products, manufacturers should furnish clear product information that can evoke their organic food knowledge. In addition, it is time for producers to promote young adults' understanding of the benefits of organic food and the important environmental aspects that are worth emphasizing in their marketing strategies during the production phase. The knowledge and understanding of organic food, especially among young adults, needs to be expanded by utilizing all technologies and artificial intelligence to promote awareness and knowledge of organic food. This is a hope to strengthen the steps taken by the government to increase the awareness of Malaysians to buy organic food.

The findings of this study provide new insights into the organic food purchasing behavior of young adults in the Malaysian context. Further research with longitudinal studies across a larger population and geographical area can contribute to a better understanding of organic food purchasing behavior in Malaysia. Further. It is recommended to conduct research by focusing on the comparison of consuming preferences for specific organic food products among Malaysian populations. Additional research can be implemented to decide which segments are excellent in imitation of market or accordance with organic food as much as an access regarding building sustainable ruin pattern because of the future. It is also strongly recommended that focusing on environmental sustainability and product knowledge is similarly important rather than just health benefits.

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Appendix 1: Measurement of Instruments

Statements
Buying Behaviour
My intention to buy organic food can increase with my knowledge about organic food.
Government policy can help me increase my intention to buy organic food
Environment improves my intention to buy organic food
My intention to buy organic food can develop with the level of my perceived value
My attitudes are related to my intention to buy organic food
My intention to buy organic food comes from health reasons
Environmental Concern
The environment should be protected
The production of conventional food does not harm the environment
Organic food production is better for the environment because it uses no/fewer chemical instruments
Organic food production is better for the environment because it uses no/less growth hormones
Organic food production practices are better for the environment
The environment is adequately protected
Organic Food Knowledge
Study about organic food provides me with information about how much chemicals I consume every day.
Organic farmers put more care into farming methods and trends
Self-knowledge is important in organic food taste perception
I do purchase organic food because of good knowledge about it
The benefits of organic food for my health increase my intention to buy organic food
Development in knowledge and education helps me to understand the benefits of organic food for the environment
Health Consciousness
My health is very important for me
Organic foods are healthier than normal foods
Organic foods are natural and therefore better for my health
Organic foods are healthier because they have no/less growth hormone additives and antibiotics
Organic foods are healthier because have no/fewer chemical residues
Organic foods are healthy

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Artificial Intelligence-Powered Risk Assessment in Supply Chain Safety

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Abstract: The increasing complexity and globalization of supply chains necessitate robust risk management strategies to ensure safety and resilience. Traditional risk assessment methods often fall short in dynamically adapting to the rapidly changing conditions and voluminous data inherent in modern supply chains. This study explores the potential of Artificial Intelligence (AI)-powered risk assessment to address these limitations in the context of Malaysia's supply chain industry. By employing AI technologies such as machine learning, IoT, and predictive analytics, organizations can significantly enhance their risk management capabilities, improving predictive accuracy, real-time monitoring, and overall operational efficiency. Through a qualitative analysis involving in-depth interviews with supply chain managers, AI experts, and technology vendors, the study identifies the strategies employed for AI integration, the perceived effectiveness of these technologies, and the challenges faced in implementation. The findings highlight the importance of robust data governance, the development of explainable AI models, and continuous skill development to overcome barriers related to data quality, model interpretability, and high implementation costs. The study concludes with recommendations for fostering a safer and more resilient logistics environment in Malaysia, emphasizing the need for comprehensive AI adoption frameworks and scalable solutions for small and medium-sized enterprises.

Keywords: *Artificial Intelligence, Supply Chain Risk Management, Logistics Safety*

1. Introduction

The increasing complexity and globalization of supply chains have made risk management a critical component of logistics and supply chain operations (Narayanan et al., 2024a). Traditional risk assessment methods, while valuable, often fall short in dynamically adapting to the rapidly changing conditions and voluminous data typical of modern supply chains (Mkumbo et al., 2019; Sundram et al., 2018; Selvaraju et al., 2017). This limitation has led to a growing interest in leveraging artificial intelligence (AI) to enhance risk assessment capabilities (Ivanov et al., 2019).

AI technologies, including machine learning (ML) and advanced analytics, offer the potential to transform supply chain risk management by providing more accurate predictions, real-time insights, and automated decision-making processes. These technologies can analyze vast amounts of data from various sources, identify patterns and correlations, and predict potential disruptions and safety issues before they occur. The application of AI in supply chain risk assessment is expected to significantly improve the resilience and safety of logistics operations (Vatumalae et al., 2020; Wamba & Akter, 2019).

Despite the promising capabilities of AI, its integration into supply chain risk management is not without challenges. Issues such as data quality, model interpretability, and the need for substantial computational resources pose significant hurdles. Furthermore, the complexity of supply chains requires AI systems to be highly adaptable and context-aware to provide reliable risk assessments (Riahi et al., 2021).

The primary problem addressed in this study is the inadequacy of current risk assessment methodologies to effectively predict and mitigate safety issues in complex supply chain environments. Traditional approaches

often rely on historical data and static models that do not account for the dynamic nature of supply chains or the vast amounts of real-time data generated by modern logistics operations (Sivan, Anuar, Krishnasamy, Bahrin, Narayanan, & Sundram, 2024a). As a result, there is a pressing need for innovative solutions that can enhance the accuracy and responsiveness of risk assessments (Vatumalae et al., 2022).

AI-powered risk assessment has the potential to address these limitations by offering more sophisticated analytical capabilities and real-time processing of diverse data streams. However, the practical implementation of AI in supply chain safety management remains underexplored, with limited empirical evidence on its effectiveness and best practices for deployment. This study aims to bridge this gap by investigating how AI algorithms can be used to assess and manage risks in supply chains, with a focus on predicting potential safety issues and optimizing safety protocols.

2. Literature Review

Supply chain risk management (SCRM) has evolved significantly over the past few decades, driven by the increasing complexity and globalization of supply chains. Traditional risk management approaches, which often rely on historical data and static models, have been criticized for their inability to adapt to the dynamic nature of modern supply chains (Tang, 2006). These methods typically involve identifying potential risks, assessing their likelihood and impact, and implementing mitigation strategies (Christopher & Peck, 2004). However, the rapidly changing business environment, characterized by unpredictable disruptions such as natural disasters, geopolitical tensions, and pandemics, demands more agile and responsive risk management solutions (Ivanov et al., 2019).

The Role of Artificial Intelligence in Supply Chain Management

Artificial Intelligence (AI) has emerged as a transformative technology across various industries, including supply chain management. AI encompasses a range of technologies, such as machine learning (ML), natural language processing (NLP), and computer vision, that enable machines to learn from data and perform tasks that typically require human intelligence (Russell & Norvig, 2020). In the context of supply chains, AI applications include demand forecasting, inventory optimization, route planning, and predictive maintenance (Choi et al., 2018).

AI's potential in enhancing supply chain risk management lies in its ability to process large volumes of data from diverse sources, identify patterns and correlations, and provide real-time insights. For instance, ML algorithms can analyze historical and real-time data to predict potential disruptions, while NLP can process unstructured data, such as news articles and social media posts, to identify emerging risks (Wamba & Akter, 2019).

AI-Powered Risk Assessment in Supply Chains: AI-powered risk assessment involves using AI algorithms to identify, evaluate, and mitigate risks in supply chains. This approach offers several advantages over traditional methods, including improved accuracy, real-time analysis, and the ability to handle complex and high-dimensional data (Wang et al., 2020).

Predictive Analytics and Machine Learning: Predictive analytics, powered by ML, is a key area where AI contributes to risk assessment. By training models on historical data, ML can predict the likelihood of future disruptions and their potential impact. For example, ML algorithms have been used to forecast supply chain disruptions caused by weather events, geopolitical tensions, and supplier failures (Papadopoulos et al., 2017).

Natural Language Processing (NLP): NLP enables the processing and analysis of unstructured data, such as text from news articles, social media, and industry reports. This capability allows supply chain managers to identify emerging risks that may not be evident from structured data alone. For instance, NLP can detect early warning signals of geopolitical instability or changes in trade regulations that could impact supply chains (Kamble et al., 2020).

Real-Time Monitoring and IoT Integration: The integration of AI with Internet of Things (IoT) devices enhances real-time monitoring and risk assessment capabilities. IoT devices generate vast amounts of data on

various aspects of supply chain operations, such as location, temperature, and humidity. AI algorithms can analyze this data to detect anomalies and predict potential risks, such as equipment failures or deviations from optimal conditions (Wang et al., 2020).

Despite the promising potential of AI in supply chain risk management, several challenges and limitations need to be addressed. One major challenge is data quality and availability. AI algorithms require large amounts of high-quality data to perform effectively, but obtaining such data can be difficult due to issues such as data silos, inconsistencies, and privacy concerns (Riahi et al., 2021).

Another challenge is model interpretability. While AI algorithms, particularly deep learning models, can achieve high accuracy, their decision-making processes are often opaque, making it difficult for supply chain managers to understand and trust their recommendations. This lack of transparency can hinder the adoption of AI in risk management (Guidotti et al., 2019).

Additionally, the implementation of AI in supply chains requires substantial computational resources and technical expertise. Small and medium-sized enterprises (SMEs) may find it challenging to invest in the necessary infrastructure and talent to leverage AI effectively (Kamble et al., 2020).

AI-powered risk assessment represents a promising frontier in supply chain risk management, offering the potential to enhance predictive accuracy, real-time monitoring, and overall resilience (Sundram, Ghapar, Chew, & Muhammad, 2023). However, addressing the challenges of data quality, model interpretability, and accessibility is essential for realizing this potential. Future research should focus on developing innovative solutions that overcome these barriers, paving the way for more effective and widespread adoption of AI in supply chain safety management (Sundram, Ghapar, Osman, Chew, & Muhammad, 2023).

3. Research Methodology

Conceptual Framework

The conceptual framework for this study is grounded in the integration of AI technologies in supply chain risk management. The framework posits that AI can enhance supply chain safety by improving predictive capabilities, enabling real-time monitoring, and providing actionable insights for risk mitigation. This framework draws on existing literature that highlights the potential of AI in transforming traditional supply chain practices (Choi et al., 2018; Wamba & Akter, 2019). The framework also considers the challenges associated with AI implementation, such as data quality and model interpretability, as critical factors influencing the effectiveness of AI in supply chain risk management.

Sampling

The qualitative part of this study employs a purposive sampling strategy to select participants who are knowledgeable and experienced in supply chain management and AI implementation. The sample includes:

Supply Chain Managers: Individuals responsible for overseeing supply chain operations and risk management in their organizations.
AI Experts: Professionals with expertise in developing and implementing AI solutions in supply chains.
Technology Vendors: Representatives from companies that provide AI and IoT solutions for supply chain management. A total of 6 participants were selected, ensuring a diverse representation of industries, including manufacturing, retail, logistics service providers, and healthcare.

Data Collection

Data was collected through in-depth semi-structured interviews. This method allows for a detailed exploration of participants' experiences, perspectives, and insights regarding AI-powered risk assessment in supply chains (Zetty et al., 2020). The interviews were conducted either in person or via video conferencing, depending on the participants' availability and preferences.

Interview Duration: Each interview will last approximately 60 minutes, allowing for a thorough discussion of the topics.

Recording and Transcription: With participants' consent, all interviews will be audio-recorded and transcribed verbatim to ensure accuracy in data analysis.
Confidentiality: Participants will be assured of the confidentiality and anonymity of their responses. Personal identifiers will be removed from the transcripts, and data will be stored securely.
Interview Questions: The interview questions are designed to elicit detailed and comprehensive responses related to the study's objectives. The questions are open-ended to encourage participants to share their experiences and insights freely.

AI Adoption and Implementation:
How has your organization integrated AI into its supply chain risk management processes?
What specific AI technologies (e.g., machine learning, IoT, predictive analytics) are being used?

Challenges and Barriers:
What challenges have you encountered in implementing AI for risk management in your supply chain?
Can you provide examples of situations where AI has significantly enhanced supply chain safety?

By employing this qualitative methodology, the study aims to gain rich (Sivan, Anuar, Krishnasamy, Bahrin, Narayanan, & Sundram, 2024b), in-depth insights into the role of AI in supply chain risk management, the challenges faced by practitioners, and potential solutions for overcoming these challenges.

4. Data Analysis

Table 1: Respondent Demographics

Respondents ID	Role	Industry	Years of Experience in Supply Chain	Years of Experience in AI Implementation
1	Supply Chain Manager	Manufacturing	15	5
2	AI Expert	Retail	10	8
3	Technology Vendor	Logistics	20	10
4	Supply Chain Manager	Healthcare	12	4
5	AI Expert	Manufacturing	8	6
6	Technology Vendor	Retail	18	7

The demographic table presents a diverse group of six respondents, including two supply chain managers, two AI experts, and two technology vendors, all operating within various industries in Malaysia, such as manufacturing, retail, logistics, and healthcare. The respondents' extensive experience in supply chain management (ranging from 8 to 20 years) and AI implementation (ranging from 4 to 10 years) underscores their deep expertise in the field. However, the relatively small sample size and concentration of respondents from large and medium-sized companies (with only one from a small company) may limit the generalizability of the findings. Additionally, while the table reflects a broad representation of industries within Malaysia, the absence of respondents from other sectors could result in a narrow perspective. This diverse yet limited demographic snapshot provides valuable insights into AI-powered risk assessment in Malaysian supply chains but also highlights the need for broader inclusion to fully capture the impact across all industry sectors in the country.

Table 2: Data Analysis -Thematic Analysis

Interview Question	Codes	Themes
	AI Adoption and Implementation	
How has your organization integrated AI into its supply chain risk management processes?	Step By Sep Integration	AI Integration Methods
	Pilot Testing	Implementation Process
	Gradual Rollout	Strategies for AI Adoption
What specific AI technologies (e.g., machine learning, IoT, predictive analytics) are being used?	Use of Machine Learning Algorithms	AI Technologies Used
	IoT Sensors for Real-Time Monitoring	
	Predictive Analytics Software	Types of Technologies
	Implementation of Specific AI Tools	
	Challenges and Barriers	
Can you provide examples of situations where AI has significantly enhanced supply chain safety?	Case of Improved Hazard Detection	Practical Examples
	Success in Predicting Disruptions	Real-World Impact
	Example of Improved Safety Compliance	
What challenges have you encountered in implementing AI for risk management in your supply chain?	Issues with Data Quality	Implementation Challenges
	Difficulty in Interpreting AI Models	
	High Implementation Costs	Barriers to AI Adoption
	Lack of Skilled Personnel	

The study reveals that AI adoption in supply chain risk management reveals that organizations employ a structured, methodical approach to integrate AI technologies such as machine learning, IoT, and predictive analytics. Strategies like step-by-step integration, pilot testing, and gradual rollout are essential to manage complexity and mitigate risks associated with AI deployment. These methods ensure that AI tools enhance supply chain safety by providing advanced analytical capabilities, real-time data insights, and predictive modelling. The perceived effectiveness of AI is notably positive, with improvements in predictive accuracy, faster risk mitigation responses, increased operational efficiency, and real-time data analysis, all contributing to a more resilient and reliable supply chain.

However, significant challenges persist, including issues with data quality, model interpretability, high implementation costs, and a shortage of skilled personnel (Sundram, Rajagopal, Atikah & Subramaniam, 2018). These barriers can impede the full realization of AI's potential in enhancing supply chain safety. Organizations address these challenges through robust data governance, developing explainable AI models, regular training, and adopting advanced technical solutions. By overcoming these obstacles, AI can play a pivotal role in optimizing supply chain processes, reducing manual errors, and improving overall productivity, thereby significantly enhancing supply chain safety and resilience.

Discussion

The integration of Artificial Intelligence (AI) into supply chain risk management processes represents a transformative approach that holds significant potential for enhancing supply chain safety, particularly within the context of Malaysia. This study's findings highlight the structured and methodical strategies that organizations in Malaysia adopt to integrate AI technologies. These strategies include step-by-step integration, pilot testing, and gradual rollout, ensuring that AI tools are deployed effectively to enhance supply chain safety

through advanced analytical capabilities, real-time data insights, and predictive modeling (Ivanov et al., 2019; Wamba & Akter, 2019).

The use of specific AI technologies such as machine learning algorithms, IoT sensors for real-time monitoring, and predictive analytics software illustrates the diverse technological landscape in Malaysia's supply chain sector. These technologies facilitate improved predictive accuracy, faster risk mitigation responses, increased operational efficiency, and real-time data analysis, all of which contribute to a more resilient and reliable supply chain (Narayanan et al., 2024a). The positive reception and perceived effectiveness of these technologies indicate their critical role in modernizing supply chain risk management practices (Kamble et al., 2020; Wang et al., 2020).

However, the study also uncovers significant challenges that impede the full realization of AI's potential in enhancing supply chain safety. Issues related to data quality, model interpretability, high implementation costs, and a shortage of skilled personnel are major barriers that organizations must address. Data quality issues, for instance, can significantly undermine the effectiveness of AI models, leading to inaccurate predictions and unreliable risk assessments (Riahi et al., 2021). Similarly, the complexity and opacity of some AI models make it difficult for supply chain managers to interpret and trust AI-generated insights, which can hinder adoption and effective utilization (Guidotti et al., 2019).

Addressing these challenges requires robust data governance frameworks that ensure the integrity and quality of data across the supply chain (Sundram, Rajagopal, Nur Atiqah, Atikah & Appasamy, Zarina, 2018). Developing explainable AI models is also crucial to enhance transparency and build trust among users (Jobin et al., 2019). Regular training programs can help bridge the skills gap, equipping supply chain professionals with the necessary expertise to implement and manage AI technologies effectively. Additionally, providing scalable and cost-effective AI solutions can facilitate broader adoption, especially among small and medium-sized enterprises (SMEs) that may find the financial barriers prohibitive (Al Doghan & Sundram, 2023).

The findings of this study underscore the need for a comprehensive approach to integrating AI into supply chain risk management in Malaysia. By overcoming the identified challenges and leveraging AI's potential, organizations can optimize their supply chain processes, reduce manual errors, and significantly enhance overall productivity and safety. This approach not only aligns with global best practices but also positions Malaysia's supply chain sector to be more resilient and competitive in the face of evolving risks and uncertainties (Sivan et al., 2022).

The adoption of AI-powered risk assessment in Malaysia's supply chain industry demonstrates promising potential to enhance safety and resilience. However, the successful realization of these benefits hinges on addressing critical challenges related to data quality, model interpretability, costs, and skill development. By implementing comprehensive data governance, developing explainable AI models, investing in continuous training, and providing accessible AI solutions, Malaysia can foster a safer and more efficient supply chain ecosystem. These efforts will contribute to sustainable growth in the logistics sector, ensuring the well-being of workers and the public involved in supply chain operations while aligning with global standards for safety and security (Othman et al., 2023).

5. Conclusion and Recommendations

This study highlights the significant potential of AI-powered risk assessment in enhancing the predictive accuracy, operational efficiency, and real-time monitoring of Malaysia's supply chains. While AI technologies offer transformative benefits, challenges such as data quality, model interpretability, and the high cost of implementation still pose barriers to their widespread adoption. Addressing these issues is essential for fully realizing AI's potential to improve supply chain safety and resilience.

To overcome these challenges, it is crucial to implement robust data governance frameworks that ensure data integrity and security and develop explainable AI models that foster transparency and trust. Additionally, regular training programs should be established to equip supply chain professionals with the necessary skills to manage AI technologies effectively. Providing scalable, cost-effective AI solutions tailored to the needs of

small and medium-sized enterprises (SMEs) will also be key to democratizing access to these advanced tools.

Continuous monitoring and periodic reassessment of AI implementations are recommended to maintain their effectiveness in an evolving risk landscape. Encouraging collaboration between industry players, academia, and government bodies can further support the adoption and optimization of AI in supply chain risk management. By addressing these challenges and fostering a collaborative environment, Malaysia's supply chain sector can enhance its resilience, safety, and global competitiveness.

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Integrating Resource-Based Theory and Contingency Theory for Enhancing Supply Chain Resilience in Malaysia: A Post-Pandemic Analysis

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Abstract: The COVID-19 pandemic has significantly disrupted global supply chains, exposed their vulnerabilities and underscored the urgent need for enhanced resilience. In Malaysia, the pandemic's impact on supply chains has been profound, prompting a re-evaluation of existing strategies and frameworks. This study explores the integration of Resource-Based Theory (RBT) and Contingency Theory (CT) to enhance supply chain resilience in Malaysia. Through in-depth case studies and semi-structured interviews with senior managers and supply chain professionals, this research identifies key factors contributing to the successful implementation of an integrated resilience framework. The findings reveal that firms leveraging advanced technology, skilled workforce, and strategic partnerships can maintain operational efficiency and adaptability. Context-specific strategies such as diversifying suppliers, local sourcing, strategic stockpiling, and flexible logistics solutions are essential in responding to disruptions. Common challenges include high initial costs, coordination issues, regulatory hurdles, and cultural resistance to change. The integration of RBT and CT results in improved supply chain visibility, flexibility, robustness, and stakeholder collaboration. This study contributes to the academic discourse by offering practical insights for firms seeking to enhance supply chain resilience. It underscores the importance of combining internal strengths with adaptive strategies tailored to the external environment. The findings provide valuable guidance for both academia and industry in developing more robust and adaptive supply chain strategies in the post-pandemic landscape. Future research should explore the integration of RBT and CT across different contexts and industries and investigate the role of emerging technologies in enhancing supply chain resilience.

Keywords: *Resource Based Theory, Contingency Theory, Supply Chain Resilience, Post-Pandemic*

1. Introduction

The COVID-19 pandemic has fundamentally disrupted global supply chains, exposed their vulnerabilities and highlighted the urgent need for greater resilience. In Malaysia, the pandemic's impact on the supply chain has been profound, affecting various industries and prompting a re-evaluation of existing strategies and frameworks (Chowdhury et al., 2021; Sundram et al., 2018; Selvaraju et al., 2017). Supply chain resilience-the ability to anticipate, prepare for, respond to, and recover from disruptive events—has become a critical focus for both practitioners and scholars (Narayanan, Ghapar, Chew, Sundram, Jayamani & Muhammad, 2024a).

Resource-Based Theory (RBT) and Contingency Theory (CT) are two prominent theoretical frameworks that offer valuable insights into building resilient supply chains. RBT posits that firms can achieve sustained competitive advantage by effectively leveraging their unique resources and capabilities (Barney, 1991). In contrast, CT emphasizes the importance of aligning organizational strategies with specific environmental conditions to enhance performance (Donaldson, 2001; Mkumbo et al 2019). Integrating these two theories provides a robust approach to developing supply chain strategies that are both resource-efficient and contextually adaptive (Sundram, Ghapar, Osman, Chew, and Muhammad, 2023).

The post-pandemic landscape presents an opportunity to apply this integrated theoretical framework to enhance supply chain resilience in Malaysia. As businesses navigate the complexities of a rapidly changing

global environment, understanding how to effectively combine RBT and CT can offer critical insights for sustaining operational continuity and achieving long-term success (Sundram, Ghapar, Chew & Muhammad, 2023).

Despite the extensive research on supply chain resilience, there remains a gap in understanding how to effectively integrate RBT and CT to address the unique challenges posed by the COVID-19 pandemic, particularly within the Malaysian context. Existing studies predominantly focus on either resource-based strategies or contingency planning in isolation, without considering the potential synergies between these approaches (Kaufmann & Roesch, 2012; Pettit, Croxton, & Fiksel, 2013).

This research aims to fill this gap by exploring how the integration of RBT and CT can enhance supply chain resilience in Malaysia during the post-pandemic period. Specifically, this study seeks to answer the following questions: How can Malaysian firms strategically align their resources and contingency plans to mitigate supply chain disruptions? What are the key factors that contribute to the successful implementation of an integrated resilience framework? By addressing these questions, this research will provide valuable insights for both academia and industry, contributing to the development of more robust and adaptive supply chain strategies.

2. Literature Review

The need for enhanced supply chain resilience has gained unprecedented attention in the wake of the COVID-19 pandemic. This literature review explores the integration of Resource-Based Theory (RBT) and Contingency Theory (CT) as frameworks to develop resilient supply chains, with a specific focus on the Malaysian context. The review synthesizes existing research on supply chain resilience, RBT, and CT, and identifies gaps in the literature that this study aims to address.

Supply Chain Resilience

Supply chain resilience is defined as the capacity of a supply chain to prepare for, respond to, and recover from disruptions while maintaining its operational capabilities (Ponomarov & Holcomb, 2009; Vatumalae et al., 2020; Sundram et al., 2018). The concept has evolved over the past two decades, driven by an increasing frequency of disruptions, including natural disasters, geopolitical events, and most recently, the COVID-19 pandemic (Ivanov & Dolgui, 2020). Scholars identify several key elements that contribute to supply chain resilience, including flexibility, redundancy, visibility, collaboration, and agility (Christopher & Peck, 2004). Flexibility refers to the ability of supply chain components to adapt to changes, while redundancy involves maintaining excess capacity or inventory to cushion against disruptions. Visibility and collaboration emphasize real-time information sharing and coordination among supply chain partners, and agility focuses on the speed of response to disruptions (Vatumalae et al., 2022; Sundram et al., 2020).

Resource-Based Theory (RBT)

Resource-based theory (RBT) posits that a firm's competitive advantage is derived from its unique resources and capabilities that are valuable, rare, inimitable, and non-substitutable (Barney, 1991). In the context of supply chains, RBT suggests that firms with superior resources—such as advanced technology, skilled labor, and robust infrastructure—are better positioned to withstand and recover from disruptions (Wernerfelt, 1984). RBT has been widely applied in supply chain management to explain how firms can leverage their internal resources to achieve resilience. For instance, firms that invest in advanced information technology systems can improve supply chain visibility and coordination, thereby enhancing their ability to anticipate and respond to disruptions (Wang, Jie, & Abareshi, 2015).

Contingency Theory (CT)

Contingency Theory (CT) asserts that there is no one-size-fits-all approach to management; instead, effective management strategies depend on the specific context or environment in which an organization operates (Donaldson, 2001). In supply chain management, CT emphasizes the need for adaptive strategies that align with the external environment, such as market volatility, technological changes, and regulatory requirements. CT has been used to highlight the importance of context-specific strategies in achieving supply chain resilience. For example, firms operating in highly volatile markets may benefit from flexible and adaptive supply chain designs that can quickly respond to changes in demand or supply conditions (Sousa & Voss, 2008).

Integration of RBT and CT

The integration of RBT and CT offers a comprehensive approach to building resilient supply chains by combining the internal strengths of a firm with context-specific adaptive strategies. This integrated approach recognizes that while unique resources and capabilities are essential for resilience, their effectiveness is contingent upon the external environment (Eisenhardt & Martin, 2000). Studies have shown that firms that successfully integrate RBT and CT are better equipped to handle disruptions. For instance, a study by Brandon-Jones et al. (2014) found that firms that leveraged their unique resources (RBT) and adapted their supply chain strategies to market conditions (CT) were more resilient during the 2008 financial crisis.

Supply Chain Resilience in Malaysia

Malaysia's strategic location and diversified economy make it a critical player in global supply chains. However, the COVID-19 pandemic exposed significant vulnerabilities in Malaysia's supply chains, particularly in sectors such as electronics, automotive, and pharmaceuticals (Yong, Haron, & Li, 2021). The integration of RBT and CT can provide valuable insights into enhancing the resilience of Malaysian supply chains. Malaysian firms face several challenges, including limited access to advanced technology, dependency on global supply chains, and regulatory constraints. However, there are also opportunities to enhance resilience through strategic investments in technology, fostering collaboration among supply chain partners, and adopting adaptive strategies tailored to the local context (Narayanan, Ghapar, Chew, Sundram, Jayamani & Muhammad, 2024b; Omar et al., 2020).

Gaps in the Literature

Despite the extensive research on supply chain resilience, there is a lack of studies that explicitly integrate RBT and CT within the Malaysian context. Most existing research focuses on either RBT or CT in isolation, without exploring the potential synergies between these frameworks (Kaufmann & Roesch, 2012; Pettit, Croxton, & Fiksel, 2013). Additionally, there is limited empirical evidence on how Malaysian firms can apply these integrated strategies to enhance supply chain resilience in the post-pandemic landscape. As such, this underscores the importance of integrating Resource-Based Theory and Contingency Theory to develop resilient supply chains. By combining the internal strengths of a firm with adaptive strategies tailored to the external environment, this integrated approach provides a robust framework for addressing supply chain disruptions. The review identifies significant gaps in the existing literature, particularly within the Malaysian context, and sets the stage for the current study to explore how Malaysian firms can enhance their supply chain resilience in the post-pandemic era.

3. Research Methodology

The methodology for this study involves a qualitative approach, focusing on in-depth case study analysis to explore how Malaysian firms integrate Resource-Based Theory (RBT) and Contingency Theory (CT) to enhance supply chain resilience. The study examines three key industries: electronics, automotive, and pharmaceuticals.

Conceptual Framework

The conceptual framework integrates RBT and CT to provide a comprehensive approach to supply chain resilience. RBT focuses on leveraging a firm's unique resources and capabilities, while CT emphasizes the need for adaptive strategies that align with the external environment. The framework aims to understand how these theories can be combined to mitigate supply chain disruptions and sustain operational continuity (Barney, 1991; Donaldson, 2001; Sivan, Anuar, Krishnasamy, Bahrin, Narayanan & Sundram, 2024b).

Sampling

Purposive sampling is used to select firms from the electronics, automotive, and pharmaceutical industries in Malaysia (Zetty et al., 2020) This method ensures the inclusion of information-rich cases that provide valuable insights into supply chain resilience practices (Patton, 2015). Approximately three firms, one from each industry, will be selected for detailed case study analysis. The inclusion criteria for these firms are as follows: they must have been significantly impacted by the COVID-19 pandemic, have implemented strategies to enhance supply chain resilience, and have senior managers or supply chain professionals available and willing to participate in in-depth interviews.

Data Collection

Data will be collected through semi-structured interviews with senior managers and supply chain professionals from the selected firms, exploring the integration of RBT and CT in enhancing supply chain resilience (Creswell & Poth, 2017). Participants will first be contacted and briefed on the study's purpose, confidentiality, and consent procedures. Each interview, lasting approximately 60-90 minutes, will be audio-recorded with the participant's consent, and detailed notes will be taken to capture non-verbal cues and contextual information. After the interviews, the recordings will be transcribed verbatim, and participants will be allowed to review and verify the accuracy of their transcripts.

4. Data Analysis

The qualitative data collected from the interviews will be analyzed using thematic analysis. This method involves identifying, analyzing, and reporting patterns (themes) within the data (Braun & Clarke, 2006; Sivan, Anuar, Krishnasamy, Bahrin, Narayanan & Sundram, 2024a).

Steps in Thematic Analysis:

Data Familiarization: Immersing in the data by reading and re-reading the interview transcripts and listening to the audio recordings.

Initial Coding: Generating initial codes from the data by labelling segments of text that are relevant to the research questions.

Theme Development: Examining the codes to identify broader patterns or themes.

Reviewing Themes: Reviewing and refining the themes to ensure they accurately represent the data.

Defining and Naming Themes: Assigning clear definitions and names to each theme.

Reporting: Presenting the themes in a coherent and compelling narrative, supported by quotes from the data.

The analysis will focus on identifying how firms in the electronics, automotive, and pharmaceutical industries integrate RBT and CT to enhance supply chain resilience, the challenges they face, and the outcomes of these efforts. The findings will be presented in detailed case study analyses, highlighting the unique resources, adaptive strategies, integration challenges, and resilience outcomes for each firm.

Table 1: Respondent Demographics for Case Study Organization

Characteristic	Company A	Company B	Company C
Industry	Electronics	Automotive	Pharmaceuticals
Years of Operations	7 years	10 years	14 years
Respondent's Designation and Identification Code	Supply Chain Manager (A1) Operations Director (A2) Procurement Manager (A3	Supply Chain Manager (B1) Operations Director (B2) Logistics Coordinator (B3)	Supply Chain Manager (C1) Operations Director (C2) Procurement Manager (C3) Chief Operating Officer (C4)

Table 1 provides an overview of the demographics of respondents from three companies in different industries: electronics (Company A), automotive (Company B), and pharmaceuticals (Company C). This diversity ensures the study covers a wide range of supply chain dynamics and challenges, each with unique characteristics and requirements. The years of operation vary among the companies, with Company A having 7 years, Company B with 10 years, and Company C with 14 years. This variation indicates that the study includes organizations at different stages of maturity, providing insights into how supply chain resilience practices evolve.

The respondents hold senior and strategic positions within their organizations. Company A includes a Supply Chain Manager, Operations Director, and Procurement Manager; Company B includes a Supply Chain Manager, Operations Director, and Logistics Coordinator; and Company C includes a Supply Chain Manager, Operations Director, Procurement Manager, and Chief Operating Officer. This ensures that the insights provided are

reflective of both operational and strategic perspectives, given the seniority and roles of the participants.

Overall, the respondent demographics highlight the diverse industry representation, varied years of operation, and senior-level designations of the participants. This diversity is beneficial for the study as it provides a comprehensive view of supply chain resilience practices across different sectors and organizational stages. The inclusion of high-level executives ensures that the insights and strategies discussed are robust and applicable to a wide range of supply chain contexts.

Case Study 1: Electronics Industry

Company A is a leading electronics manufacturer in Malaysia, specializing in semiconductor production. The COVID-19 pandemic disrupted its supply chain, causing delays in raw material supplies and impacting production schedules.

Table 2: Case Study Analysis of Company A

No	Aspect	Description
1	Unique Resources (RBT)	Advanced manufacturing technology, skilled workforce, strategic partnerships ("Our cutting-edge technology and highly skilled staff were pivotal in maintaining operations during the pandemic." - Respondent A1) ("Strategic partnerships helped us secure critical supplies." - Respondent A2) ("The expertise of our workforce allowed us to quickly adapt to new processes." - Respondent A3)
2	Adaptive Strategies (CT)	Diversification of suppliers, real-time monitoring systems, flexible production processes ("We diversified our supplier base and implemented real-time monitoring to swiftly adapt to supply chain changes." - Respondent A1) ("Flexible production processes enabled us to switch between products based on the availability of materials." - Respondent A2) ("Real-time monitoring helped us anticipate and mitigate disruptions." - Respondent A3)
3	Integration Challenges	High dependency on global suppliers, and cultural resistance to change. ("One of our biggest challenges was our reliance on international suppliers and resistance to changing established practices." - Respondent A1) ("Transitioning to new suppliers was costly and time-consuming." - Respondent A2) ("There was significant resistance from some departments to adopt new strategies." - Respondent A3)
4	Resilience Outcomes	Improved supply chain visibility, enhanced flexibility in production, and faster recovery times. ("These strategies significantly improved our visibility and flexibility, allowing us to recover more quickly from disruptions." - Respondent A1) ("We are now able to respond to supply chain disruptions more effectively." - Respondent A2) ("Our recovery times have shortened due to better coordination and flexibility." - Respondent A3)

Company A leveraged its advanced manufacturing technology and skilled workforce to maintain operational efficiency. By diversifying suppliers and implementing real-time monitoring systems, the company adapted to the pandemic's disruptions. Despite facing challenges such as dependency on global suppliers and cultural resistance, the integration of RBT and CT resulted in improved visibility, flexibility, and recovery times.

Case Study 2: Automotive Industry

Company B is a major automotive parts supplier in Malaysia. The pandemic severely disrupted its supply chain, particularly in the procurement of essential components from international suppliers.

Table 3: Case Study Analysis of Company B

No	Aspect	Description
1	Unique Resources (RBT)	Extensive distribution network, strong brand reputation, skilled engineering team. ("Our extensive distribution network allowed us to quickly reroute supplies." - Respondent B1) ("Our strong brand reputation helped us maintain supplier relationships." - Respondent B2) ("The expertise of our engineering team was crucial in adapting our processes." - Respondent B3)
2	Adaptive Strategies (CT)	Local sourcing initiatives, inventory optimization, strategic alliances with local firms ("We initiated local sourcing to reduce dependency on international suppliers." - Respondent B1) ("Optimizing our inventory helped us manage supply chain disruptions more effectively." - Respondent B2) ("Forming strategic alliances with local firms strengthened our supply chain." - Respondent B3)
3	Integration Challenges	High initial costs for local sourcing and coordination issues with new suppliers. ("The shift to local sourcing incurred high initial costs." - Respondent B1) ("Coordinating with new suppliers was a significant challenge." - Respondent B2) ("We faced difficulties in aligning our processes with new suppliers." - Respondent B3)
4	Resilience Outcomes	Reduced dependency on international suppliers and increased supply chain robustness. ("Our dependency on international suppliers has significantly decreased." - Respondent B1) ("Our supply chain is now more robust and capable of handling disruptions." - Respondent B2) ("We have seen a marked improvement in supply chain stability." - Respondent B3)

Company B utilized its extensive distribution network and strong brand reputation to navigate the supply chain disruptions caused by the pandemic. By initiating local sourcing and optimizing inventory, the company reduced its dependency on international suppliers. Although the shift to local sourcing incurred high initial costs and coordination issues, the integration of RBT and CT enhanced the supply chain's robustness.

Case Study 3: Pharmaceuticals Industry

Company C is a pharmaceutical company in Malaysia that faced significant challenges during the pandemic, particularly in sourcing raw materials and ensuring timely delivery of products.

Table 3: Case Study Analysis of Company C

No	Aspect	Description
1	Unique Resources (RBT)	Advanced research and development (R&D) capabilities, and robust distribution channels. ("Our advanced R&D capabilities were crucial in developing new products quickly." - Respondent C1) ("Robust distribution channels ensured continuous supply of products." - Respondent C2) ("Our strong R&D team helped us innovate and adapt rapidly." - Respondent C3) ("Effective distribution networks were vital in maintaining supply chain continuity." - Respondent C4)

2	Adaptive Strategies (CT)	Strategic stockpiling, collaboration with government agencies, and flexible logistics solutions. ("Strategic stockpiling helped us manage supply shortages." - Respondent C1) ("Collaboration with government agencies facilitated smoother operations." - Respondent C2) ("Flexible logistics solutions allowed us to adapt to transportation challenges." - Respondent C3) ("Working with government agencies was key in overcoming regulatory hurdles." - Respondent C4)
3	Integration Challenges	Regulatory hurdles, logistical constraints in stockpiling ("Regulatory hurdles were a major challenge in our operations." - Respondent C1) ("Stockpiling posed logistical constraints that we had to manage." - Respondent C2) ("Navigating complex regulations was difficult and time-consuming." - Respondent C3) ("Logistical challenges in stockpiling were significant." - Respondent C4)
4	Resilience Outcomes	Ensured continuous supply of critical medicines, and enhanced collaboration with stakeholders. ("We ensured a continuous supply of critical medicines despite the disruptions." - Respondent C1) ("Collaboration with stakeholders improved significantly." - Respondent C2) ("Our ability to supply critical medicines remained uninterrupted." - Respondent C3) ("Stakeholder collaboration was greatly enhanced, improving overall resilience." - Respondent C4)

Company C capitalized on its advanced R&D capabilities and robust distribution channels to mitigate supply chain disruptions. By strategically stockpiling critical raw materials and collaborating with government agencies, the company ensured a continuous supply of essential medicines. Despite facing regulatory hurdles and logistical constraints, the integration of RBT and CT improved the company's ability to maintain supply chain continuity and enhanced collaboration with stakeholders.

Cross-Case Analysis

The three case studies illustrate how firms in different industries have successfully integrated RBT and CT to enhance supply chain resilience. Key findings include:

Unique Resources (RBT): Across all case studies, firms leveraged their unique resources, such as advanced technology, skilled workforce, and strong distribution networks, to maintain operational efficiency and adaptability.

Adaptive Strategies (CT): Companies adopted context-specific strategies, such as diversifying suppliers, local sourcing, strategic stockpiling, and flexible logistics solutions, to respond to the pandemic's disruptions.

Integration Challenges: Common challenges included high initial costs, coordination issues, regulatory hurdles, and cultural resistance to change. Addressing these challenges required careful planning and stakeholder engagement.

Resilience Outcomes: The integration of RBT and CT resulted in improved supply chain visibility, flexibility, robustness, and stakeholder collaboration, enabling faster recovery and continuity in operations.

These findings demonstrate the value of integrating Resource-Based Theory and Contingency Theory in developing resilient supply chains, offering practical insights for firms seeking to enhance their supply chain resilience in the post-pandemic landscape.

Discussion

The integration of Resource-Based Theory (RBT) and Contingency Theory (CT) in enhancing supply chain resilience has yielded significant insights, particularly within the context of the post-pandemic landscape in Malaysia. The case studies conducted in the electronics, automotive, and pharmaceutical industries illustrate how firms have successfully navigated the challenges posed by the COVID-19 pandemic by leveraging their

unique resources and adopting context-specific adaptive strategies.

Electronics Industry, Company A is a leading electronics manufacturer specializing in semiconductor production, utilized its advanced manufacturing technology and skilled workforce to maintain operational efficiency amidst the pandemic-induced disruptions. The company's strategic partnerships and diversification of suppliers were crucial in enhancing supply chain resilience. Real-time monitoring systems and flexible production processes enabled Company A to adapt swiftly to changes in raw material supply and production schedules. However, the high dependency on global suppliers and cultural resistance to change were significant challenges. Despite these, the integration of RBT and CT resulted in improved supply chain visibility, enhanced flexibility in production, and faster recovery times (Barney, 1991; Donaldson, 2001).

Automotive Industry, Company B, a major automotive parts supplier, faced severe disruptions in procuring essential components from international suppliers during the pandemic. By leveraging its extensive distribution network, strong brand reputation, and skilled engineering team, the company initiated local sourcing and optimized inventory to reduce dependency on international suppliers. Strategic alliances with local firms further strengthened its supply chain. While high initial costs for local sourcing and coordination issues with new suppliers were challenges, the integration of RBT and CT significantly increased supply chain robustness, demonstrating the value of a combined theoretical approach (Christopher & Peck, 2004; Ivanov & Dolgui, 2020).

Pharmaceuticals Industry, Company C, a pharmaceutical firm, faced significant challenges in sourcing raw materials and ensuring timely product delivery. The company's advanced research and development capabilities and robust distribution channels played a pivotal role in mitigating these disruptions. Strategic stockpiling, collaboration with government agencies, and flexible logistics solutions were key adaptive strategies. Regulatory hurdles and logistical constraints in stockpiling presented challenges, but the integration of RBT and CT improved the company's ability to maintain supply chain continuity and enhanced collaboration with stakeholders (Pettit, Croxton, & Fiksel, 2013).

5. Conclusion, Implication and Recommendation for future research

This study has provided valuable insights into how integrating Resource-Based Theory (RBT) and Contingency Theory (CT) can enhance supply chain resilience in Malaysia, especially in the post-pandemic context. By analyzing case studies from the electronics, automotive, and pharmaceutical industries, the research demonstrates how firms can leverage unique resources and implement adaptive strategies tailored to specific environmental conditions. The findings highlight that firms with advanced technological capabilities, strategic partnerships, and skilled workforces are better positioned to respond to disruptions. However, challenges such as high initial costs, regulatory hurdles, and cultural resistance to change remain significant barriers that need to be addressed.

The implications of this study are far-reaching for both practitioners and scholars in supply chain management. For practitioners, the research underscores the importance of aligning internal resources with external environmental conditions to build resilient supply chains. Firms are encouraged to invest in advanced technologies, foster strategic partnerships, and enhance workforce capabilities to improve their resilience against future disruptions. Additionally, the findings suggest that addressing cultural resistance and regulatory challenges is critical for the successful implementation of these strategies. For scholars, the study contributes to the academic discourse by offering a nuanced understanding of how RBT and CT can be integrated to develop more robust and adaptive supply chain strategies. It opens up new avenues for research on the synergies between these theories and their application in different contexts.

Future research should explore the integration of RBT and CT across various industries and geographical regions to validate and expand upon the findings of this study. Comparative studies between developed and developing economies could provide additional insights into how different environmental conditions influence the effectiveness of these integrated strategies. Longitudinal studies are also recommended to assess the long-term impact of RBT and CT integration on supply chain resilience, particularly as firms continue to adapt to an increasingly complex global environment. Moreover, the role of emerging technologies such as artificial

intelligence, big data analytics, and blockchain in enhancing the integration of RBT and CT warrants further investigation. These technologies could offer innovative solutions to some of the challenges identified in this study, such as improving data visibility, streamlining regulatory compliance, and fostering a more agile organizational culture. By addressing these research gaps, future studies can contribute to the development of more resilient and adaptive supply chains, better equipped to navigate the uncertainties of the post-pandemic world.

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Exploring the Drivers, Challenges, and Opportunities of Supply Chain Technology Adoption for Small and Medium Enterprises (SMEs) in Malaysia

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Abstract: Small and Medium Enterprises (SMEs) have a crucial impact on the Malaysian economy, making major contributions to the functioning of the supply chain. Integrating supply chain technology has become a crucial element in enhancing the efficiency and competitiveness of SMEs in Malaysia. During recent years many developing and developed countries have witnessed the expansion of markets and supply chain networks; in the progress of these market and supply systems SMEs find various complexities when they are implementing or improving the technology integration of their supply chain. The current body of literature often addresses the adoption of technology in a general manner or within larger organizations, resulting in a significant gap in study about the specific circumstances and requirements of small and medium-sized enterprises (SMEs). This study employs a rigorous methodology that analyzes relevant papers to examine the drivers, challenges, and opportunities for adopting supply chain technology among SMEs in Malaysia. By implementing supply chain technology, Malaysian SMEs can increase their performance in many areas of key performance indicators. This includes improving efficiency, optimizing inventory management, achieving cost savings, enhancing customer service, and increasing market competitiveness. It is believed that the findings of the study can be useful for managers of SMEs, policymakers, and interested stakeholders. This will enable SMEs to navigate the challenges of adopting technology more effectively and enhance global competitiveness.

Keywords: *Supply chain technology adoption, Small and Medium Enterprises (SMEs), drivers, challenges, opportunities, performance.*

1. Introduction and Background

Small and Medium Enterprises (SMEs) play a crucial role in Malaysia's economic structure, making substantial contributions to employment, innovation, and GDP. According to the most recent data released by the Department of Statistics, Malaysia (DOSM, 2023), there were a total of 1,101,725 small and medium enterprises (SMEs). These SMEs made up 39.1% of the country's Gross Domestic Product (GDP) in 2023, contributing a value-added amount of RM613.1 billion. When looking at the distribution of SMEs concentration of various sectors over the years it is clear that the service sector has always exceeded 80%of all SMEs in total. The most recent profile of SMEs in 2023 shows that the services sector accounted for 83.9% of the total, with a total of 924,170 enterprises. The construction sector continued to be the second greatest contributor, accounting for 9.3% (102,657 enterprises). Meanwhile, around 5.4% of small and medium-sized enterprises (SMEs), totaling 59,316 organizations were engaged in the manufacturing sector. This was followed by 1.2% (13,099 firms) in the agriculture sector, and the last 0.2% (2,483 firms) in the mining and quarrying sector. Of the total small and medium companies (SMEs) in Malaysia, the majority, comprising 69.7% or 767,421 firms, were microenterprises. Concurrently, enterprises of small size made up 28.5% of the total (314,465 firms), while medium-sized firms accounted for the remaining 1.8% (19,839 firms).

In the face of growing competition and complexity in global marketplaces, small and medium-sized enterprises (SMEs) must embrace and incorporate innovative supply chain technology to maintain and improve their competitiveness. Supply chain technology adoption involves the integration of cutting-edge technological solutions like blockchain, Internet of Things (IoT), artificial intelligence (AI), and big data analytics to optimize supply chain operations, enhance efficiency, and improve overall performance (Kaur, Awasthi & Luthra, 2021). Despite such benefits, Malaysian SMEs are faced with several challenges whenever deploying such technologies. Technological progress in SMEs is impeded by limited technology access, high costs for implementation and maintenance, and insufficient infrastructure. Furthermore, the presence of organizational inertia, which is defined as a lack of support from management and a strong reluctance to change, amplifies the challenges associated with adopting new technologies (Tay, Alipal & Lee, 2021). Otherwise, there are other

challenges that SMEs are confronted with, which do not allow them to invest in the required integrated technology since they are financially limited. Moreover, the lack of adequate governmental assistance and regulatory frameworks fails to offer the necessary incentives or direction.

Malaysian SMEs also face some challenges in implementing supply chain technology since not many understand the value and opportunities that accrue with the use of supply chain technology. SMEs frequently fail to fully capitalize on the potential benefits of supply chain innovations, such as cost reduction, lead time improvement, and increased customer service, because of a lack of knowledge in this area (Ismail, Saman & Ghani, 2021). In addition, many facilities and infrastructures are lacking, which poses challenges to the organization's functioning and acts as barriers to the optimal application of these technologies (Alkatheeri and Ahmad (2024). Since these are sinister hurdles, basic research needs to be conducted that maps the drivers, challenges, and opportunities of implementing supply chain technology into SMEs. This study seeks to address this deficiency by conducting a comprehensive analysis of the factors that impact the adoption of technology among SMEs in Malaysia. It will investigate the challenges they encounter as well as the opportunities that can be capitalized on.

It is equally important to comprehend the forces that may motivate or demotivate SMEs about technology adoption to identify actionable strategies to encourage the firms to acquire technology that could help with their development. These drivers encompass factors such as perceived complexity, usefulness, compatibility, financial resources, and top management support, among others. However, by identifying the issues, it becomes possible to create focused solutions that directly tackle specific obstacles. Furthermore, acknowledging the potential advantages offered by supply chain technology can assist SMEs and policymakers in developing policies that optimize the benefits of technological adoption. This paper provides significant information to policymakers and SMEs on ways in which such strategies can be developed or improved for enhancing technology adoption in the supply chain.

2. Drivers that influence SMEs' adoption of supply chain technology in Malaysia

The Malaysian government has been engaged in the active promotion of digitalization by launching various policies including the Industry4WRD policy which is aimed at enhancing the rate of implementation of Industry 4.0. Concerning that, more industries are initiating the adoption and implementation of technologies including the Internet of Things, artificial intelligence, and big data analysis (MITI, 2018). These policies include financial incentives, training, and support that would encourage SMEs to incorporate complex technologies into their supply chains. Additionally, the escalating competition in both domestic and international markets necessitates that small and medium-sized enterprises (SMEs) enhance and innovate their supply chain processes. SMEs can respond quickly to market demands and maintain a competitive edge by leveraging advanced technologies such as blockchain, IoT, and AI, which provide significant advantages in terms of efficiency, transparency, and agility (Tay, et al., 20201). In addition, Fabeil, Pazim, and Langgat (2020) have emphasized the necessity of resilient and adaptable supply chains that can sustain disruptions in light of the COVID-19 pandemic, which has further accelerated the digital transformation agenda.

The adoption of supply chain technology in Malaysia is influenced by a variety of drivers including both internal and external drivers, such as perceived usefulness, perceived compatibility, perceived complexity, top management support, financial resources, the size of the organization, and many others. It is essential to comprehend these drivers to develop effective strategies that encourage the adoption of technology among SMEs. Particularly in their supply chain operations, SMEs frequently encounter distinctive obstacles to competitiveness. The efficacy, efficiency, and responsiveness of supply chains can be improved through the implementation of advanced technologies. Policymakers, business leaders, and researchers must comprehend the drivers that influence the adoption of these technologies. The following are the drivers of technology adoption, as determined by the previous studies:

Driver 1: Perceived complexity

Rogers (2003) defines complexity as the level at which an invention is perceived as challenging to understand and implement. Consequently, although the majority of individuals within a social system may comprehend certain changes in the organization, certain changes are more challenging and require a longer time to adjust

to. Similarly, Alam, Ali, and Jani (2011) asserted that prior studies consistently demonstrate a negative correlation between the perceived complexity of a new technology and its adoption rate. The intricacy of supply chain technology can have a substantial impact on its adoption by small and medium-sized enterprises (SMEs). SMEs may exhibit reluctance to accept technology when they regard it as too intricate or challenging to comprehend and implement. To solve this difficulty, it is crucial to streamline the technology and offer comprehensive training and assistance (Nguyen & Ngo, 2021).

Driver 2: Perceived usefulness

SMEs evaluate the perceived usefulness of supply chain technology concerning its potential advantages and benefits. Included in this category are factors such as enhanced competitiveness, improved decision-making, cost reductions, and increased efficiency (Mohamad Faisal & Idris, 2020).

Driver 3: Perceived compatibility

One critical aspect is how well supply chain technology integrates with preexisting infrastructure, procedures, and company ethos. According to Mohamad Faisal and Idris (2020) and Lin, Alam, Ho, Al-Shaikh, and Sultan (2020), SMEs are more likely to adopt a new technology if this technology will fit into their current activity and work in parallel with it. In addition, they also mentioned that the adoption of technology is more likely to happen in SMEs if the technology can be integrated as an addition to current workflow and processes.

Driver 4: Top management support

Supply chain technology can only be adopted if top management gives its support and commitment to the change. Senior management plays a key role in influencing the level of acceptance and investment made by SMEs in technology where they are willing to accept technological change if the senior management in the organization recognizes the importance of the process and encourages it (Mohamad Faisal and Idris (2020), & Lin, Alam, Ho, Al-Shaikh, and Sultan (2020). In a similar vein, another researcher has stated that parity received from upper-level management has a positive impact on technological adoption (Alsetoohy, Ayoun, Arous, Megahed, & Nabil, 2019). Furthermore, Lin et al., (2020) asserted that the endorsement of innovative technologies by senior management exerts a significant influence on their acceptance. In small and medium-sized enterprises (SMEs), the individuals in charge, whether they be managers or owners, hold the highest level of authority and are involved in all aspects of decision-making inside the organization.

Driver 5: Financial resources

Significantly, the existence of adequate financial resources and investment capacities can affect the implementation of supply chain technology. SMEs may find it difficult to acquire and implement technologies as they may not be able to afford to invest heavily. Hence, government initiatives and subsidies can assist in reducing this obstacle (Mishra, 2013). Furthermore, Azman et al. (2020) asserted that the primary obstacle encountered by SMEs, namely micro-entrepreneurs, is the scarcity of funds or restricted availability of financial resources.

Driver 6: Technical knowledge and expertise

SMEs' technical knowledge and skill in supply chain technology can have a substantial impact on adoption. A lack of technical skills and understanding can impede the adoption process. Training programs and capacity-building activities can assist SMEs in developing the skills required to effectively embrace and use supply chain technology (Bansal, Kumar, Kumari, & Kuzmin, 2023)

Driver 7: Organizational size

The adoption of supply chain technology by an SME might be influenced by its size. Medium-sized enterprises with greater financial and operational capacities may be better equipped to allocate resources towards the implementation of technological advancements, in contrast to smaller enterprises. Nevertheless, smaller SMEs can still reap advantages from government support and programs that are expressly aimed at their size category (Lin, Alam, Ho, Al-Shaikh, & Sultan, 2020).

Driver 8: Customer and regulatory pressure

According to Fernando, (2015), external variables such as customer needs and regulatory restrictions, might impact SMEs' use of supply chain technology. If clients expect or want technology-enabled supply chain

procedures, SMEs may be more driven to implement the technology to meet those expectations. Similarly, regulatory pressure or incentives can encourage small and medium-sized enterprises to adopt new technology.

These drivers influence how Malaysian SMEs use supply chain technology. By addressing all of these drivers and offering assistance with training, funding, and technology simplification, SMEs can overcome the challenges and successfully integrate supply chain technology into their operations.

3. Key challenges faced by SMEs in Supply Chain Technology Adoption

Supply chain technology is critical for improving a business's efficiency, reducing costs and increasing customer satisfaction, enhancing efficiency, improving cooperation among stakeholders, and also outcompeting competitors. While there are apparent benefits, the literature also reveals many challenges faced by SMEs restricting the use of supply chain technology. These challenges include:

Restricted technology accessibility

Challenges that may point SMEs to difficulties in getting and implementing supply chain technologies include high costs, constraints in infrastructure, and poor technical know-how. It rests on the governmental and industrial associations to solve this problem by funding, training, and offering infrastructural facilities to enhance technology access for SMEs (Mohamad Faisal & Idris, 2020).

The expense of technology and infrastructure

According to Mohamad Faisal and Idris, (2020), supply chain technology can be somewhat expensive, covering hardware and software needs as well as deployment and training costs. Small and Medium enterprises are mostly affected by inadequate resources, particularly the SMEs operating with low capital, the cost associated with procurement, installation, and training of technology may be substantial (Bhardwaj, Garg, & Gajral, 2021). Although there has been an inclination towards the adoption of supply chain technologies by SMEs there are several impediments that hinder the widespread adoption of the technologies. The main issue with high implementation costs remains a problem, especially for organizations with limited budgets. Many small and medium-sized businesses (SMEs) are discouraged from implementing creative technologies by their great cost of acquisition and implementation.

Insufficient organizational support

Effective application of supply chain technologies depends on the support of top-level executives. Still, small and medium-sized businesses (SMEs) can lack the support of top-level executives, which would cause possible losses or even stop the implementation process. The major concern surrounding the utilization of Industry 4.0 of the manufacturing climate is its applicability to the SMEs. One of the challenges that are evident in 4.0 technologies is an absence of passion and positive attitude from their customers as well as the business associates. Moreover, the collective performance of the group is much influenced by the anxiety of failing regarding Industry 4.0 technology (Kumar & Ayedee, 2021).

Insufficient government support

Governments can facilitate the use of supply chain technology by small and medium-sized firms (SMEs). This includes the provision of financial assistance, education, and advice. However, many countries lack sufficient government support for small and medium-sized enterprises (SMEs) in this specific area (Mishra, 2013). In Malaysia, the government has set ambitious targets for SMEs' contribution to the country's GDP and exports (Salim, Marlapa, Ismail, Rahman, Hussin, Susilastuti, & Murti, 2022). However, achieving these targets will require a concerted effort to improve SMEs' access to financing, increase productivity, and encourage technology adoption. The adoption of digital technology can help SMEs improve their competitiveness and enhance their ability to compete in the global market.

Lack of knowledge and awareness

SMEs could suffer from ignorance of the benefits and possibilities of supply chain technologies. It is also likely to be specific to small and medium enterprises and their necessity to be focused on in terms of knowledge about the benefits of the mentioned technologies application. Effective ways to reach this are seminars, workshops, and knowledge-sharing platforms (Fernando, 2015). Moreover, Kumar and Ayedee (2019) pointed out the

main challenges to the application of technology as the lack of specialized knowledge and the related costs of change.

Financial constraints

When it comes to investing in supply chain innovations, small and medium-sized businesses (SMEs) might face budgetary limits. To combat this, the government can devise programs that provide small and medium-sized enterprises (SMEs) with low-interest loans, subsidies, or incentives to embrace and execute supply chain innovations (Fernando, 2015). Other researchers Martini, Setiawan, Tanding, Khresna, & Asrihapsari. (2023) mentioned that in the ever-changing business environment, all businesses, including SMEs, must embrace technology to confront challenges and ensure survival. However, it is acknowledged that SMEs may encounter difficulties in adopting digital technology, primarily due to financial constraints and a lack of innovation capability.

Insufficient facilities and infrastructure

When it comes to supply chain adoption and innovations, small and medium-sized businesses (SMEs) might lack the necessary facilities and infrastructure. By establishing shared technology centers or providing access to pooled resources, government agencies, industry groupings, and SMEs can collaborate to improve infrastructure (Fernando, 2015). Another major hurdle is integration issues. It can be difficult and time-consuming to integrate new technology with existing systems and procedures in a way that works well for everyone involved. Managing integrations can be particularly difficult for small and medium-sized businesses (SMEs) because of their limited resources and lack of technical expertise. According to Alkatheeri and Ahmad (2024), this may lead to disruptions and inefficiencies in operations**.**

Limited managerial capabilities

Small and medium-sized businesses (SMEs) might lack the managerial skills and knowledge required to effectively apply supply chain technologies. Using capacity-building initiatives, training, and mentoring campaigns, small and medium-sized businesses (SMEs) will be better equipped with the necessary abilities to properly employ supply chain technologies and have managerial capacities raised (Mohamad Faisal & Idris, 2020).

Shortage of technical skills and experience

Another downside is that SMEs do not possess the technical competence and experience that is required in selecting and integrating supply chain technologies. Misunderstandings about how to effectively use the technology and problems with its implementation may ensue (Mohamad Faisal & Idris, 2020). Specialized skilled people are necessary for the management and deployment of such complicated equipment; although the companies may not possess such human resources (Bag, Gupta, Kumar, & Sivarajah, 2021). A major hurdle is the lack of adequately trained personnel. Adopting and effectively managing supply chain technologies can be challenging for SMEs due to a lack of specific knowledge and abilities. SMEs face difficulties in making effective use of new technology capabilities because of the presence of this skills gap (Ismail et al., 2021). In addition, Ta and Lin (2023) highlight various challenges faced by SMEs in adopting digital transformation. These challenges encompass a shortage of technical and managerial skills, restricted access to finance, limited financial and human resources for development, technology, and markets, as well as the need for effective business structures.

Resistance to change

Both staff and management may be resistant to change when it comes to implementing new technologies. According to Romero & Mammadov, (2024), this reluctance might be caused by things like aversion to change, worries about possible dangers, or concerns about upsetting existing habits. Besides, if people are comfortable with what they used to see or experience, they are likely to resist change (Lee et al., 2022). Technology adoption in the supply chain presents some challenges to SMEs even though there are resources and specialists available. Problems like this might arise when different departments fail to communicate and work together effectively, when employees are resistant to change, or when there are unclear goals and objectives (Mohamad Faisal & Idris, 2020). In addition to that, new practice implementation may face serious challenges because both the management and employees may not want a change. As a result of these risks and other forms of uncertainty that surround the use of new technology, many SMEs are normally not willing to deviate from their set routines

and systems (Qutaishat, Abushakra, Anaya, & Al-Omari, (2023).

The benefits of supply chain technology can only be completely realized by SMEs if they overcome all of these challenges. According to a study conducted by Mohamad Faisal and Idris (2020), SMEs can overcome these challenges by taking the following steps: using the right technology, getting enough help, communicating clearly with staff, setting clear goals, and working together with other departments. Consequently, SMEs can reap the benefits of supply chain technology, such as improved efficiency, visibility, and decision-making capacities, by overcoming these challenges.

4. Opportunities for Supply Chain Technology Adoption for SMEs

Supply chain technology therefore comes in handy for SMEs, especially if they are keen on growing to be efficient, competitive, and keen on meeting consumers' needs in the market. Currently, the existing market system has slowly formed a large and highly coordinated market system so that SMEs gradually develop new technological advancements to sustain their growth rate and achieve a higher level of efficiency. This paper seeks to analyze the implication of supply chain technology to determine whether it holds any possibility that may work to the advantage of SMEs. Among those opportunities, some of them include the following:

Enhanced Efficiency

There is a great chance to increase operational efficiency by adopting supply chain technology. Rapid process automation (RPA) and other advanced manufacturing technology and automation tools streamline routine tasks, reduce human error, and boost output (Bhardwaj, Garg & Gajpal, 2021). Two areas within an organization that can benefit from Robotic Process Automation (RPA) include order processing and inventory management. That way, the workers can then attend to the more important tasks within the company. The use of IoT devices enables real-time monitoring of the supply chain thus achieving less downtime and more visibility (Pereira & Romero, 2017).

Enhanced Decision-Making

By use of supply chain technology, especially artificial intelligence (AI) and machine learning (ML), SMEs are given sophisticated analytical capabilities that enable enhanced decision-making. By applying AI and ML, data can be scanned for large volumes to come up with forecasted outcomes. This in turn assists the SMEs to aggressively manage risks, forecast the market, and reduce supply chain complexity (Min, 2021). Predictive analytics, for example, may more precisely forecast demand, which lets SMEs adjust their inventory to avoid stockouts or overstock events. In the presence of market changes, this data-driven strategy for decision-making increases the general resilience and responsiveness of SMEs.

Cost Reduction

Costs can be significantly reduced for SMEs by using innovations in the supply chain. By improving inventory management, decreasing transportation charges, and reducing waste, big data analytics and blockchain technology help to reduce costs (Dubey, Gunasekaran & Childe, 2020). By using big data analytics, SMEs may find out some specifics of the supply chain, trends, or patterns, thus enhancing their allocations snuffing out financial misuse of resources, or even lessening operational costs. Due to this, blockchain technology offers a way of securing and reviewing the transactional process hence minimising fraud as well as errors. Given the potentially devastating financial consequences of such events for SMEs, this is very welcome news (Saberi, Kouhizadeh, Sarkis, & Shen, 2018). Furthermore, cloud computing solutions provide SMEs with an adaptable and economical IT infrastructure, according to Lacity and Reynolds (2014), since they do away with the need for large upfront expenditures in software and hardware.

Increased Agility and Responsiveness

Using supply chain technology helps SMEs to meet customer needs and rapidly change with the state of the economy. SMEs are capable of responding promptly to disruptions within the supply chain and scarce resources and adapting to existing market conditions through the application of IoTs as well as AI, which offer real and correct information and data (Ivanov & Dolgui, 2020). IoT sensors can spot supply chain anomalies and start quick fixes, therefore preventing likely disruptions. Analytics driven by artificial intelligence can identify evolving market trends, which lets SMEs modify their goods and approach to fit changing customer

preferences. Small and medium-sized businesses (SMEs) benefit from more flexibility in maintaining their competitive advantage in markets undergoing fast development.

Improved Cooperation

Technology and digital platforms have made it easier for all parties involved in the supply chain—including customers, partners, and suppliers to work together more effectively. Improved collaboration and coordination are outcomes of using cloud-based solutions, which allow for the efficient transfer and sharing of information (Bag et al., 2021). Through effective collaboration in integrated business environments, suppliers and SMEs stand to benefit from better production planning and shorter lead time implementation. For businesses to thrive, better collaboration is essential since it strengthens supplier connections and supply chain networks. Hence, SMEs may build stronger supply chains with the help of digital technology. This will allow them to better handle disruptions and seize new opportunities as they come.

Impact of Technology Adoption on SMEs' Performance

Adoption of supply chain technology helps one to assess the performance of SMEs in Malaysia by looking at key performance indicators including cost reduction, lead time improvement, inventory management, customer service enhancement, and general competitiveness per Mishra (2016). SMEs in Malaysia can reduce wastage, act more efficiently, and thus save money when using supply chain technology. Moreover, supply chain technology can improve lead times by simplifying procedures, therefore lowering delays, and encouraging departmental communication and cooperation. Furthermore, technology helps small and medium-sized businesses (SMEs) in Malaysia in inventory management by improving demand forecasting, lowering stockouts, and offering real-time inventory level visibility. This means that through supply chain technology, lead-time, tracking delivery, and order fulfillment are reduced to improve customer experience (Mishra, 2013). Furthermore, by increasing productivity, lowering expenses, and raising customer service, these technologies help SMEs to be more generally competitive (Mishra, 2016; Fernando, 2015). Through the use of supply chain technology, SMEs in Malaysia can enhance their performance based on several key performance indicators, which include efficiency, cost reduction, and competitiveness in the market.

5. Recommendation and Future Trends

The awareness of Malaysian SMEs regarding the benefits of embracing digitalization in enhancing efficiency and competitiveness will significantly enhance the implementation of supply chain technology by Malaysian SMEs in the coming years. To encourage SMEs in supply chain technology adoption, further research is needed to explore and understand the specific barriers and challenges that hinder their uptake of digital technology as follows:

Analyze government policy

Identify the policy of the Malaysian government, rules, regulations, and support in promoting technology adoption among SMEs. Assess the effectiveness of existing initiatives and identify potential areas for improvement to better facilitate technology adoption and integration into SME operations.

Incorporating cutting-edge technologies

Cutting-edge technology such as 5G, robotics, and machine learning is one of the major upcoming trends in Malaysian supply chain technology adoption. Rapid and dependable connectivity is essential for real-time data exchange and decision-making; 5G technology is expected to revolutionize supply chains in this regard (Khaw, Alhamzah, Hadi, Victor, Yuvara, & Nadia, 2022). Robotics and also automation have the potential to boost the operational efficiency of the company. This is because they can replace humans as workers, make procedures more precise, and speed up industrial operations. Additionally, machine learning and artificial intelligence can provide insights and predictive analytics that help SMEs improve their supply chain operations and proactively respond to market demands (Wong, Leong, Hew, Tan, & Ooi, 2020).

Explore the successful technology adoption cases

The SMEs can observe and organize case studies of SMEs that have successfully adopted and integrated digital technology into their business processes. This can be done through identifying the strategies and also the best practices learned from these successful cases that can be replicated or adopted by other SMEs.

Analyze the role of industry associations

The company can identify the role of industry associations and networks in promoting technology adoption among SMEs. In Malaysia for example, SME Corporations and the Federation of Malaysian Manufacturers (FMM) can facilitate knowledge sharing, collaboration, and technology adoption support among their members, especially SMEs.

Explore collaboration with stakeholders

On the other hand, Lee et al. (2022) suggest that researchers investigate collaboration models that enhance coordination and cooperation among supply chain stakeholders through the utilization of digital platforms and technologies. Malaysian SMEs' future use of supply chain technology will be defined by the utilization of complex technologies, sustainability imperatives, resilience measures, and collaborative endeavors. By focussing on these areas through study and practical implementation, Malaysian SMEs can fully utilize supply chain adoption. This will lead to enhanced growth and competitiveness in the increasingly digitalized global marketplace.

Sustainability

It is almost becoming a trend that sustainability is slowly becoming a focal point for companies, especially in aspects like supply chain management and this is perhaps due to technological development. To reduce their environmental impact without sacrificing their economic viability, future research should focus on reviewing how SMEs can incorporate sustainable supply chain management practices in their business. Studies have shown that sustainable supply chain practices have multiple benefits, including lower costs in the long run, better brand recognition, and more efficient and effective business operations (Lin et al., 2020).

Conclusion

Finally, this study suggests how Malaysian SMEs can do better within this digitalized and globally competitive environment based on the literature review that underlines the significance of supply chain technology adoption in the Malaysian business community alongside its drivers, challenges, and opportunities. The positive impact of technology adoption on supply chain performance highlights the need for continuing efforts to encourage SMEs to become digital firms. Other than that, the role of incentives from the government, the top management support, skill and knowledge of employees, facilities and infrastructure, and the cost of technology, contribute to Malaysian SMEs' dynamic and ever-changing process of adopting supply chain technology. As a result, SMEs can evaluate the obstacles that lie ahead, seek solutions to those, and most importantly, disseminate the appropriate messages to the employees that will enhance the effective implementation of the technology. Malaysian governments and managers need to provide support structures for this sector by easing measures to help SMEs grow and become a major boost to the Malaysian economy. In addition, policymakers, corporations, and academia can create successful policies and investments to fully capitalize on supply chain innovations by addressing these barriers and aiding SMEs on their digital journey. Understanding the use of advanced technologies such as automation, artificial intelligence, the Internet of Things, blockchain, and cloud computing has the potential to dramatically improve the performance of Malaysian SMEs. Ultimately, understanding and overcoming the barriers to technology adoption enables SMEs to achieve long-term development, increased efficiency, and higher customer satisfaction, equipping them for success in an increasingly digitalized global market.

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The Determinants of Monetary Policy in Malaysia: Impact on Economic Activity

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Abstract: The overnight interbank rate is an essential factor for central banks to impact economic activity and preserve financial stability. It refers to the rate at which banks lend and borrow short-term funds from one another, often overnight. The overnight interbank rate plays a crucial role in the transmission mechanism of monetary policy since changes in the rate can affect the cost of borrowing and the availability of credit, which in turn impacts consumption, investment, and economic activity. According to Bank Negara Malaysia (2021), overnight transactions in the interbank market run in parallel to the existing Kuala Lumpur Interbank Offered Rate (KLIBOR). This study intends to explore time series data from 1991 to 2021 to identify the relationship between dependent and independent variables based on the ordinary least square method (OLS). Meanwhile, the study investigates whether macroeconomic variables influence the overnight interbank rate in Malaysia. Therefore, this study uses the determinant of economic indicators of unemployment (UR), domestic private credit (DGR), gross domestic product (GDP), foreign exchange (FER), and inflation (I). The data comes primarily from the World Bank and the Federal Reserve Bank (FRED). Based on results demonstrate that unemployment and inflation have the most significant impacts on monetary policy. The reason why unemployment has an impact on economic growth is that high unemployment frequently indicates resource underuse, pointing to the need for stimulative monetary policy (such as decreasing interest rates) to promote investment and expenditure and promote economic growth. To slow down the economy and cut expenditure, central banks typically raise interest rates in response to rising inflation. On the other hand, declining inflation may lead to rate reductions to boost the economy. This is a significant element of inflation in monetary policy.

Keywords: *Overnight interbank rate, Unemployment, Domestic private credit, Gross domestic credit, Foreign exchange, Inflation*

1. Introduction and Background

Financial globalization is described as the overall trend toward more international economic integration, as evidenced by a rise in cross-border monetary transactions (Prasad et al., 2005). According to Bhanumurthy and Kumawat (2020), financial globalization become a hot topic that has been discussed globally in the last three decades. Unprecedented financial globalization has taken place during the 1980s, as evidenced by the dramatic growth in capital flows experienced by both developed and developing nations. The most current phase of financial globalization has been characterized by an increase in the cash flow, most significantly, between industrial and developing countries.

We have known for a long time that the financial system is critical to the implementation of monetary policy because monetary policy aimed at macroeconomic variables is essentially a financial operation. Thus, the financial sector, via the monetary transmission mechanism, connects central bank policies and the actual economy. Because monetary policy is primarily implemented through the financial system, any change that alters its structure or circumstances may disrupt the transmission mechanisms. As a result, the effectiveness of monetary policy is vitally dependent on a set of characteristics impacted by the expansion of the financial sector (Ma & Lin, 2016). In this context, research into the relationship between financial globalization and monetary policy success has substantial theoretical and policy implications for many economies, particularly those with rapid financial growth.

The study is based on the influence of financial globalization on the monetary policy in Malaysia. Thus, a global financial cycle that reflects domestic monetary and financial conditions has sparked our curiosity to study the link between monetary policy and financial globalization in these nations. The objective of this study is to

discover whether each country's monetary policy responds to the influence of financial globalization which consists of different variables. There are six variables used in this study. The variables are Unemployment, Domestic private credit, Gross domestic credit, Foreign exchange, Inflation and Monetary policy. The focus of these variables in this study may help individuals, groups and governments to understand how these variables may affect the changes of a country's monetary policy. The issue arose when there was instability of the overnight interbank rate which impacted to public, business, and financial sectors.

The objective of this study is to discover whether each country's monetary policy responds to the influence of financial globalization which consists of different variables. The focus of these variables in this study may help individuals, groups and governments to understand how these variables may affect the changes in a country's monetary policy.

2. Literature Review

Unemployment and monetary policy

Unemployment is when citizens are seeking and asking for jobs but are sometimes unable to secure jobs. They are actively seeking availability based on their knowledge and skills. Hence, graduates should look at this issue as an opportunity for them to uplift their skills and knowledge, in line with future industrial needs. As the future is more towards the gig economy, more focus should be given to the professional workers residing in that area (Abd Rahman, Ismail, Ridzuan, Abd Samad, 2020). The employment rate is the absolute most important indicator of economic growth. Indicators of the labor market, such as the unemployment rate, have generally been known as useful metrics by which to assess the economy as a whole (Lee & Kim, 2023).

Based on the Keynesian theory of economics, they are looking for the advocate deficit spending on labor intensive to ensure that unemployment can be stimulated and wages more attractive even during downturns (Jahan, S., Mahmud, A. S., & Papageorgiou, C., 2014). Consider that Keynesian economics also says that both market economies and capitalist economic systems are prone to boom and bust cycles (Stockhammer, 2022). Low aggregate demand and high unemployment rates characterize the economy's collapse period. If the economy can re-enter its growth phase, the unemployment rate will eventually revert to normal. The Keynesian theory of unemployment serves as the foundation for explaining cyclical unemployment since it describes the impact of regular shifts in the business and economic cycle on the labor market. This is due to the theory's explanation for why cyclical unemployment occurs. People who follow the Keynesian theory of economics think that demand from consumers is the most important factor in an economy.

According to the literature by (Christoffel and Linzert, 2005, Trigari, 2006), unemployment has a substantial impact on how monetary policy is transmitted. According to the researcher's approach, a direct link between wages and inflation is established by the right-to-govern pay negotiations. Thus, they can demonstrate that the dynamics of inflation following a shock to monetary policy depend greatly on the degree of real wage rigidity. This is because under these circumstances, however, the effect of unemployment on total consumption is rather small. Next, none of the cited research specifically used cointegration techniques, which are formally intended to reveal structural breaks in the relationship between the two variables. As a result, we discovered that there is a lack of agreement in the literature, particularly in research that pertains to the situation in Malaysia. The investigation included very little agreement on any of its topics. Researchers in Malaysia conducted studies between 1980 and 2010 to determine whether or not shifts in the country's monetary policy affected the country's high unemployment rate (Georgiadis & Mehl, 2016). According to Chicheke (2009), there is a co-integration between these two variables, which is in line with what Benazic and Rami (2016) found in Croatia. The Phillips curve is not true because of these results. This study also shows that changes in the inflation rate have a bigger effect on monetary policy than changes in the unemployment rate. So, changes in the inflation rate are more significant to the monetary authority than changes in the unemployment rate. In conclusion, a lower unemployment rate could also indicate strong economic growth and robust demand for goods and services, which could support a case for a tightening of monetary policy. Thus, there is a relationship between unemployment and monetary policy according to Keynesian theory.

Domestic private credit and monetary policy

Through careful management of the supply and demand for domestic credit, monetary policy has the ability to

influence both the growth of credit and overall spending, which in turn can affect inflation, employment, and other crucial economic indicators.

An identical study was conducted in Malaysia. However, these investigations solely utilized combined data from the works of Kassim and Turkhan (2008), Kassim and Shabri (2010), and Goh and Yong (2007). To fully capture the type of reaction from this banking institution against the policy change, this scenario summoned complexity (Hosono, 2006). As a result, research using data from microbanks is still in its early stages. The banking institution was not divided into Islamic banking and regular banking, therefore the conclusion made broad sense. Bernoth and Pick (2011), conducted research and the results show a positive domestic credit trend, which shows that domestic credit can be used to gauge the health of the banking industry, but a faster GDP growth rate reduces the risk of default. More crucially, the authors emphasized that, in contrast to a model with solely observed variables, the inclusion of unobserved common characteristics in the model is essential in predicting the instability of the banking and insurance sectors.

Gross domestic product and monetary policy

A strong and sustained increase in gross domestic product (GDP hereafter) can lead to increased demand for goods and services, putting upward pressure on prices. If this results in higher inflation, a central bank may tighten monetary policy by raising interest rates to curb inflation and maintain price stability. On the other hand, if GDP growth is sluggish, a central bank may loosen monetary policy by lowering interest rates to stimulate borrowing and spending, and thus support economic growth. The state of the economy as reflected by GDP can also impact market expectations for future interest rates. If GDP growth is strong, market participants may expect interest rates to rise in the future, which can influence the behavior of consumers and businesses. Therefore, the relationship between GDP and monetary policy is not one-sided, as GDP can also impact monetary policy by influencing the central bank's decisions regarding interest rates and the money supply. The interplay between GDP and monetary policy helps to maintain economic stability and support sustainable economic growth.

In the context of actual business cycles, there has been a lot of talk about the connection that exists between Gross Domestic Product and monetary factors. Recent studies, such as the one conducted by Ellison and Sargent (2015), have demonstrated that nominal factors, such as inflation and money supply, are unable to provide an adequate explanation for actual production. However, this is not always the case because it depends on the type of economy. To formulate the most effective monetary policy, it is essential to determine the phase of the business cycle (whether it be a period of economic contraction or expansion) during which the monetary variables exert their influence on production. In conclusion, based on classical growth theory, there is a relationship between gross domestic product and economic growth.

Both monetary policy and exchange rate values are interrelated. The supply and demand of a nation's currency are both impacted by the monetary policy of that nation, which in turn has an impact on the currency exchange rate. The increase in demand for a currency might lead to an increase in that currency's value in comparison to other currencies if the central bank decides to hike interest rates. In the opposite direction, if the central bank reduces interest rates, it may cause demand for the currency to decrease, which in turn may cause the value of the currency to decrease. In the opposite direction, fluctuations in exchange rates can also affect the monetary policy of a country by influencing inflation and economic growth.
Foreign exchange and monetary policy.

Based on the findings, researchers also analyze the effects of US monetary policy transmission across different types of loans and their distribution. Lower policy rates shift bank allocation toward riskier borrowers, as shown by several empirical research (Jiménez et al., 2014, for Spain; Ioannidou et al., 2015, for Bolivia). They hypothesize that banks will move toward less risky loans as a result of their research into the effects of an increase in foreign monetary policy on lending. The data on loan disbursements is broken down into many categories, including currencies, maturities, security, and industries, so we can look into whether or not banks shift their lending toward safer bets. In addition, they assess the results of foreign monetary policy.

Foreign Exchange and monetary policy

Foreign exchange (FX) refers to the exchange of one currency for another or the conversion of one currency

into another currency. A decentralized market where currencies are purchased, sold, and traded is the foreign exchange market. The value of currencies fluctuates based on a variety of factors, including interest rates, economic growth, and political stability. Foreign exchange is used by businesses, investors, and governments to pay for goods and services, invest in foreign countries, and manage currency risk.

To understand why the impact of monetary policy on the exchange rate may have changed, it is helpful to consider a general explanation of the relationship between the exchange rate and interest rates (Ferrari et. al., 2021). The Interest Rate Parity (IRP) theory suggests that changes in interest rates may affect the value of a currency. Additionally, if a location has a higher interest rate than another, it is expected that investor would flock there in quest of larger returns on their investments, increasing the value of that region's currency.

Due to changes in the current and anticipated future differences between domestic and foreign interest rates, changes in expectations for the currency risk premium, and changes in opinions about the long-term level of the exchange rate, there are three main causes for currency rate changes in response to monetary policy events. The monetary policy transmission channel through the exchange rate has survived this period of considerable changes in financial markets and monetary policy implementation by using a properly designed event analysis to account for the multiple elements in monetary policy news.

Inflation and monetary policy

Kumawat and Bhanumurthy (2018) indicate that the monetary policy in India has been sensitive to the rate of inflation, the output gap, and the volatility of the exchange rate. In addition, the results of several studies that were conducted in the past indicate that monetary policy reacts more to the issue of inflation than it does to the issue of unemployment (Chicheke, 2009). Next, Zhang & Clovis (2010) claim that the dynamic equations for inflation in China provide signs of structural instability over time. These indications are based on the fact that the equations change over time. It has been established that the considerable change in the inflation persistence parameter is due to a response of inflation expectations to a series of adjustments in China's monetary policy framework that took place in the middle of the 1990s. These reforms took place during this period. Given that the structural change in the inflation process is primarily attributable to improvements in monetary policy and the associated improvements in inflation expectations, it is also possible for high inflation to strike back at China in the absence of a determined effort by the monetary authorities to continue managing inflation expectations. This is the case even though China has made progress in improving its monetary policy.

The relevant theory that indicates inflation related to monetary policy was Irving Fisher's theory. American economist Irving Fisher established the Irving Fisher theory (1867-1947). Fisher's theory on inflation, interest rates, and money supply underpins it. Fisher's theory also addresses inflation-interest rate relationships. Fisher felt money supply fluctuations might affect interest rates, economic activity, and inflation. He predicted inflation and higher interest rates if the money supply grew faster than the economy. Economists continually study and debate Fisher's theory, which shaped monetary economics. His research on money, pricing, and economic activity has offered a foundation for monetary policy decisions. In Irving Fisher's theory, monetary policy and inflation are linked. Fisher believes money supply changes can significantly affect the economy and inflation. Fisher predicted inflation and higher interest rates if the money supply grew faster than the economy. If the money supply declines, interest rates and inflation fall. Fisher advocated monetary policy to curb inflation. According to Irving Fishing's theory, there is a connection between monetary policy and inflation, which leads us to the following conclusion.

3. Research Methodology

Model Specification

To test the relationship between the variables of unemployment (UR), domestic private credit (DGR), gross domestic product (GDP), foreign exchange (FER), and inflation (I). Model specification for determining the connection between a dependent variable (y) and an independent variable (x). To describe the link between one dependent variable and two or more independent variables, the Multiple Regression Analysis Model is used. There are just a few models that can be employed with the multiple linear regression model. As a result, the Ordinary Least Squares (OLS) approach is being used in this research investigation. The OLS technique is a statistical analysis method that evaluates the link between variables by minimizing the sum of squared

differences between observed and corresponding values. In this research, the OLS method is used to analyze the data between monetary policy and its determinants which are unemployment, domestic private credit, gross domestic product, foreign exchange and inflation. The regression model is given below:

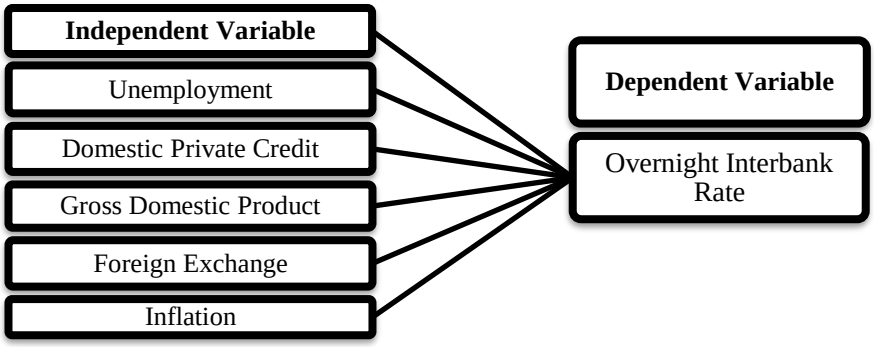
$$\gamma = \beta_0 + \beta_1 LNUR_t + \beta_2 LNDGR_t + \beta_3 LNGDP_t + \beta_4 LNFER_t + \beta_5 LNCPI_t + \varepsilon_t$$

Data Collection and Measures

This study uses annual data in the context of Malaysia, covering the period from 1991 to 2021. We began the data in 1991 due to the changes in monetary policy. This is a preliminary investigation that aims to identify the sources of the issue and provide the most accurate explanation that can be provided. To put this another way, the objective of exploratory research is not to produce conclusive answers to questions that have already been posed; rather, its focus is on merely investigating the research questions. The purpose of doing a study of this kind is often to investigate a subject that has not yet been precisely identified. The purpose of exploratory research is not to provide evidence that an issue exists; rather, it is to provide us with a deeper knowledge of the nature of the problem. This study is done to determine the nature of the problem, and its purpose is not to supply evidence that the problem exists. Quantitative research can be used to argue about how variables in a study interact with one another. According to (Ivankova, 2023), the significance of the teaching and learning process can be studied and understood through qualitative research, which focuses on investigating people's experiences with and views of social phenomena.

According to the figure 1 above shows two variables that be used in this research which are dependent variables and independent variables. The figure above indicates and explains how macroeconomic components influenced the monetary policy effectiveness in Malaysia. Based on the figure, monetary policy effectiveness is the dependent variable, and the independent variables are unemployment, domestic private credit, gross domestic product, foreign exchange, and inflation. The result of implication on the monetary policy in Malaysia comes out from the independent variables. In other words, the independent variables are the elements that will affect the monetary policy. The sources of the data are in Table 1.

Figure 1: Theoretical Framework for Monetary Policy



In this study, there are Furthermore, Multiple regression also being used to determine the connection between a dependent variable (y) and an independent variable (x). To describe the link between one dependent variable and two or more independent variables, As a result, the Ordinary Least Squares (OLS) approach is being used in this research investigation. The OLS technique is a statistical analysis method that evaluates the link between variables by minimizing the sum of squared differences between observed and corresponding values. In this research, the OLS method is used to analyze the data between monetary policy and its determinants which are unemployment, domestic private credit, gross domestic product, foreign exchange and inflation. R-squared is a statistical measure that represents the proportion of the variance in the dependent variable that is predictable from the independent variables. The t-test is used to evaluate the degree of significance to reject the null hypothesis by comparing it to the P-value. Another way to say this is that the T-test is used to decide whether or not the null hypothesis should be accepted. Another statistical is the F-Test. It is used to compare the variances of two populations. It is used to determine whether the variances of two groups are equal, and thus whether the two groups have similar dispersion.

In the diagnostic test, this study used four tests that involved time-series data which are the Variance Inflation Factor (VIF) procedure, Serial Correlation Test Normality Test on Residuals and Multiple Regression Model. Variance Inflation Factor (VIF) is a statistical measure that indicates the degree of multicollinearity (correlation between independent variables) in a multiple regression analysis. When there are strong correlations between two or more independent variables, multicollinearity occurs. It is stated to exist among the independent variables in a regression if the independent variables are connected to or reliant on one another. Next is the serial correlation test where any error terms of a time series are correlated in the manner described above, we can perform a Durbin Watson (DW hereafter) Test. The common rule is that when the DW statistic is lower than Durbin (dL) or the DW statistic is higher than 4-du, it suggests that serial correlation exists (Studenmund, 2017). Moreover, a normality test is to establish the likelihood that a given sample represents a normal distribution in the larger population. For quantitative variables to be tested using parametric methods like correlation, regression, the t-test, and analysis of variance (ANOVA), the data must follow a normal distribution. When represented on a graph like a histogram, a Box Plot, or a Frequency Polygon, time series data should take the shape of a bell-shaped curve, representing a normal probability distribution. If the data set is not normally distributed, it indicates that the 'model is not good in the representation of the data generation process (Lütkepohl, 2005).

Table 1: Definition and sources of variables

Variables	Description	Data source	Expected Relationship
Monetary Policy	Overnight Interbank Rate (OIR)	World Bank, FRED	-/+
Unemployment	Unemployment Rate (UR)	International Monetary Fund, World Bank, FRED	-/+
Domestic Private Credit	Domestic Growth Rate (DGR)	World Development Indicator	-/+
Gross Domestic Product	Gross Domestic Product (GDP)	World Bank, FRED	-/+
Foreign Exchange	Foreign Exchange Rate (FER)	World Bank, FRED	-/+
Inflation	Consumer Price Indexes (CPIs)	World Bank, FRED	-/+

The hypothesis will be considered and tested in this analysis:

Hypothesis 1

H01: Unemployment has no relationship with monetary policy.

HA1: Unemployment has a relationship with monetary policy.

Hypothesis 2

H02: Domestic private credit has no relationship with monetary policy.

HA2: Domestic private credit has a relationship with monetary policy.

Hypothesis 3

H03: Gross domestic product has no relationship with monetary policy.

HA3: Gross domestic product has a relationship with monetary policy.

Hypothesis 4

H04: Foreign exchange has no relationship with monetary policy.

HA4: Foreign exchange has a relationship with monetary policy.

Hypothesis 5

H05: Inflation has no relationship with monetary policy.

HA5: Inflation has a relationship with monetary policy.

4. Results

Regression result

Estimates are used to carry out the empirical investigation based on model specification. This allows us to examine the effects of the explanatory variables at different points in the relationship based on the impact of economic indicators on monetary policy. The empirical results discussion between the independent variables and dependent variables are shown in Table 2. The OLS estimates are shown below:

Table 2: Regression Result

DV – Overnight Interbank Rate (OIR)	$\gamma = \beta_0 + \beta_1 LNUR_t + \beta_2 LNDGR_t + \beta_3 LNGDP_t + \beta_4 LNFER_t + \beta_5 LNCPI_t + \varepsilon_t$
	Regression Method: Ordinary Least Square (OLS)
LNUR	-0.744** (-2.188)
LNDGR	0.315 (1.289)
LNGDP	0.019 (0.273)
LNFER	-0.205 (-0.621)
LNCPI	-1.356***(-5.703)
cons	7.814*** (5.873)
R-squared	0.832
F – statistic	24.815
Durbin Watson	1.025

t statistics in parentheses, p<0.10* p<0.05**, p<0.01***

Table 2 provides the regression result for the variables used in the OLS analysis. The result shows two economic indicators have a negative relationship with monetary policy determined by overnight interbank rate. It shows that if the Unemployment Rate (UR) increases by 1%, the Overnight Interbank Rate (OIR) will decrease by 0.744%. Another negative coefficient was if the Foreign Exchange Rate **(**FER) increases by 1%, the Overnight Interbank Rate (OIR) will decrease by 0.205%.

Based on the result, the adjusted r-squared is 79.88%. It depicts that 79.88% of the variations in the dependent variable can be explained by two of the independent variables which are the unemployment rate and consumer price index in the model. The remaining 20.12% is due to the omission of the other important independent variables.

Moreover, on the t-test, we have enough evidence to reject the first and fifth null hypotheses because the p-value is at significance levels of 0.05 and 0.01 respectively. Therefore, we conclude that unemployment (UR), and inflation (CPI) are influencing the movement of monetary policy in Malaysia.

Lastly, Based on F-test, we have enough evidence to reject the null hypothesis because the p-value is at 0.01 (1%). Therefore, we can conclude that there is a significant relationship between at least one of the macroeconomic variables which are unemployment (UR) and inflation (CPI) with monetary policy in Malaysia.

Diagnostic Test

VIF Procedure

Table 3: VIF Test

Variable	VIF
LNUR	1.602
LNDGR	1.397
LNGDP	1.281
LNFER	2.582
LNCPI	2.603

Sources: Author's calculation

Based on table 3 shows the test of Variance Inflation Factors (VIF) results to identify the multicollinearity. The results show all five variables scored in VIF are below 5. We found out that the Unemployment Rate (LNUR), Domestic Growth Rate (LNDGR), Gross Domestic Product (LNGDP), Foreign Exchange Rate (LNFER), and Consumer Price Index (LNCPI) were scored below 5 (Centered VIF) at the first order. Hence, we can accept all the independent variables.

Durbin Watson

Next, based on Table 2, the test proceed to the second diagnostic which is the Serial Correlation Test which is

the Durbin Watson Statistic the 1st order serial correlation test. Since DW Statistic 1st order does not fall within the range of 1.5-2.5 whereby 1.025, hence it requires us to rerun a serial correlation test at 2nd order using the Breusch Godfrey test for corrections.

Since a Durbin-Watson stat score at 2nd order (Breusch-Godfrey) falls within the range of 1.5-2.5 whereby 1.847729, hence we have enough evidence to reject the H0 of having a severe correlation among the error terms. Therefore, we may proceed with the 3rd Diagnostic Check which is Normality Test.

5. Conclusion

A total of five independent variables been found which include unemployment, domestic private credit, gross domestic product, foreign exchange and inflation have been utilized and a total of 31 annual data have been collected for Malaysia spanning from year 1991 to year 2021 from a reliable secondary source to achieve and solve the research objectives and questions. This model has been constructed in a significant way in which the independent variables utilized in explaining the dependent variable which monetary policy are derived to be at a 99% confidence interval. Furthermore, the result also emphasizes that 95.41% of the variation in monetary policy can be explained by all independent variables, therefore proving the variables that have been chosen are suitable. Overall, unemployment and inflation are the most significant to the impact of monetary policy. According to the literature by (Christoffel and Linzert, 2005, and Trigari, 2006), unemployment has a substantial impact on how monetary policy is transmitted. Kumawat and Bhanumurthy (2018) indicate that the monetary policy in India has been sensitive to the rate of inflation, the output gap, and the volatility of the exchange rate. As a result of the multiple regression, it is found that unemployment and foreign exchange have a negative relationship with monetary policy whereby the increase of unemployment and foreign exchange may decrease the monetary policy of the country. While for domestic private credit, gross domestic product and foreign exchange have both positive and negative relationships with monetary policy depending on various countries. This study will be significant to policymakers and may potentially be used as a basis for the formulation of legislation and policies about the industry. The findings of the study can be used by central banks as policymakers to design rules that promote stability and safeguard the interests of investors using the information gained from the study. This would apply specifically to enterprises in the industry. Moreover, existing and potential investor make better investment selections depending on their long-term or short-term investment objectives and for future research.

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Understanding Customer Satisfaction: A Study of Convenience Stores

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Abstract: This study explores the impact of customer satisfaction on purchasing behavior within convenience stores, focusing on four key determinants: service quality, perceived value, product quality, and trust, perceived value, and trust. The growing population and increasing consumer demand have prompted companies to enhance productivity and service standards across their convenience store branches. To maintain competitiveness and attract a diverse customer base—comprising existing, new, and potential customers—businesses need to review and refine their operational strategies continuously. The study's methodology involved a structured approach to gathering quantitative data from a specific sample of convenience store customers in Bentong City. By using surveys and questionnaires, the research aimed to capture relevant information directly from the consumers, providing insights into their experiences and satisfaction with the convenience stores. The non-probability convenience sampling method facilitated the collection of data from readily available participants, ensuring a practical and timely data collection process. Using a data set collected from 220 respondents who utilized products and services at a convenience store, this research aims to empirically investigate the relationships between service quality, perceived value, product quality, and trust, perceived value, trust, and overall customer satisfaction. The findings indicate that while all four factors contribute to customer satisfaction, service quality, perceived value, and trust exert a significantly stronger influence compared to product quality. These insights underscore the importance of prioritizing service enhancement, value creation, and trust-building initiatives in the strategic management of convenience stores, thereby ensuring sustained customer satisfaction and loyalty.

Keywords: *Customer Satisfaction, Convenience Stores, Product Quality, Service Quality, Perceived Value & Trust*

1. Introduction and Background

In recent years, substantial growth has been observed in the convenience store industry in Malaysia, driven by consumer lifestyles that increasingly prioritize convenience and flexibility in shopping. This shift towards modernity has led to a notable increase in the number of convenience stores across the country. In Malaysia, the industry's expansion has been fueled by key players such as FamilyMart, 7-Eleven, MyNews, 99 Speed Mart and CU, which have significantly contributed to this growth. Recent scholarly literature emphasizes that the rapid proliferation of convenience stores, such as FamilyMart, 7-Eleven, MyNews, 99 Speed Mart and CU, over the past decade has been driven by their innovative product offerings and enhanced accessibility (The Edge, 2024). Convenience stores are defined as small retail outlets offering a limited variety of groceries and other products, typically operating for over 18 hours a day to meet the needs of time-conscious consumers (Mendonça, et al., 2017). Traditional retail is being reshaped by the rise of e-commerce and the expansion of modern grocery retail, with convenience stores adapting through the adoption of digital advancements and the introduction of food service options (Euromonitor International, 2024).

Between 2016 and 2022, the number of convenience stores in Malaysia was projected to grow at a compound annual growth rate (CAGR) of 6%, driven by companies scaling their operations and enhancing efficiency to better compete in the market (Ee, Abdullah & Japper, 2024). According to the National Association of Convenience Stores (NACS, 2021), convenience stores offer consumers a strategic location to quickly purchase a diverse range of products and services. Convenience stores are easily accessible, allowing customers to swiftly identify, select, and purchase their desired products (Seiders, Berry and Gresham, 2000).

This study focuses on the leading convenience store chains in Malaysia, namely FamilyMart, 7-Eleven, MyNews, 99 Speed Mart and CU. These stores are strategically located near residential areas and busy hubs, underscoring the importance of location in attracting customers. Retail analysis indicates that, for convenience stores, the right location—characterized by appropriate distance from other stores and proximity to public transportation—is more critical than the sheer number of outlets in a chain (The Edge Malaysia, 2019). This

highlights the crucial role of location in driving customer traffic and enhancing business success.

Several factors, including service quality, perceived value, product quality, and trust, perceived value, product quality, and trust, have been identified as key influences on customer satisfaction in convenience stores. The influence of service quality on customer purchase intentions in convenience stores reveals the importance of this factor in the retail environment Rong and Zainal (2021). Given the limited research in this area, especially in Bentong City, this study aims to explore the determinants of customer satisfaction in purchasing from convenience stores in this region.

For a convenience store to succeed, the factors that influence customer satisfaction in the retail industry must first be understood. As store performance improves, so does customer satisfaction, leading to a positive corporate image. Meeting customer expectations requires a thorough understanding of their needs, which can be achieved through consistent and accurate communication (Ene and Ozkaya, 2014). By doing so, convenience stores can attract and retain a diverse customer base, including new, regular, and potential customers. Recent studies indicate that service quality, including tangibility, empathy, assurance, reliability, and responsiveness, significantly influences customer satisfaction (Ansari, 2019). By focusing on these elements, convenience stores can enhance their appeal and foster customer loyalty.

2. Literature Review

Customer satisfaction

Customer satisfaction measurement provides timely, unbiased insights into customer preferences and expectations, serving as a crucial performance indicator for businesses (Mihelis, Grigoroudis, Siskos, Politis, & Malandrakis, 2001). Similarly, satisfaction is an emotional state, where post-purchase emotions can range from anger, dissatisfaction, and irritation to neutrality, enthusiasm, and pleasure (Wirtz & Lovelock, 2021). Customer satisfaction can be understood, drawing from various definitions, as the emotional evaluation or sentiment experienced by customers when their needs and expectations are met through the use of a company's products or services. The product is more likely to be recommended to others by satisfied customers, aligning with the company's goals (Crosby, Evans, and Cowles, 1990). Effective measurement of customer satisfaction often involves using surveys, engagement metrics, and social media monitoring to gather feedback and understand customer sentiments (Baker, 2023).

Organizations adopting a customer-oriented perspective are better positioned to deliver quality, enhance customer satisfaction, and effectively achieve organizational objectives (Kim & Cha, 2002). Satisfaction is a comprehensive response, influencing the gap between prior expectations and the perceived outcome after consuming or retiring a service product, where the perceived performance of the chosen service meets consumer expectations Oliver (2010). Recent literature supports these views, emphasizing that a customer-oriented approach significantly enhances customer satisfaction and loyalty (Lee, & Park, 2023). By prioritizing these aspects, organizations can better meet customer expectations and foster a positive corporate image (Yan & Fan, 2022).

Customer satisfaction is a crucial metric for businesses, providing valuable insights into customer preferences and expectations. The gap between customer expectations and perceived product or service performance influences the emotional response. Therefore, loyal advocates, driving business growth, are more likely to emerge from satisfied customers. Thus, to achieve high levels of customer satisfaction and overall business success, an organization must maintain a customer-centric focus.

Product Quality

The quality of a product or service is determined by its inherent qualities and attributes. According to Russell and Taylor (2006), product quality is defined as "fitness for use" or "conformance to requirements". The International Organization for Standardization (ISO) defines product quality as 'the ability to satisfy the market and the customers' (Lakhal and Pasin, 2008). Quality is constituted by eight dimensions: perceived quality, functionality, compliance, features, serviceability, durability, and aesthetics (Garvin, 1984). Additionally, a positive relationship between product quality and customer satisfaction was found by Tran and Le (2020). It was established by the study that customer satisfaction serves as a mediator between product quality and

consumer behavior (Tsiotsou, 2006). The factors influencing satisfaction, such as quality and performance, have been extensively highlighted in the literature. Kotler (1989) defines product quality as the ability of a product to fulfill its intended function, which is particularly critical in product-based industries. The research investigated the interrelationships among three key elements of quality-customer satisfaction, price, and behavioral intention—within the context of quick-service restaurants, specifically examining the impact of service, food, and the physical environment (Ryu & Han, 2010).

A systematic review highlights that perceived value and service quality are crucial in influencing customer satisfaction and intention to continue the relationships (Adeyemo, & Oyewunmi, 2024). Additionally, firm performance is significantly impacted by customer satisfaction, with high satisfaction levels leading to loyalty being increased, and positive word-of-mouth generated (Euromonitor International, 2024). The integration of digital services and enhanced customer experiences has also been identified as vital for meeting modern consumer expectations and fostering satisfaction (Smith & Lee, 2021). By focusing on these elements, businesses can better align their offerings with customer needs and drive long-term success.

A product's inherent characteristics and its ability to meet customer needs are encompassed by the multifaceted concept of product quality. Research has identified various dimensions of quality, including functionality, features, and durability. Importantly, product quality is closely linked to customer satisfaction, influencing subsequent consumer behavior. Product quality is essential in all industries, but its impact is especially pronounced in product-based sectors. Furthermore, factors such as price and the overall customer experience also interact with product quality to shape customer perceptions and behaviors.

Service Quality

Service quality is crucial for maintaining a company's reputation, satisfying valued customers, and capitalizing on market opportunities (Mahato & Goet, 2020). It is imperative that all employees within an organization commit to delivering the highest standard of customer service (Surahman et al., 2020). Service quality consists of five key dimensions: reliability, which is the ability to consistently and accurately deliver promised services; tangibles, referring to physical facilities, equipment, and the appearance of personnel; assurance, which includes competence, courtesy, credibility, and security, reflecting employees' ability to inspire trust and confidence; responsiveness, defined as the willingness to assist customers and provide prompt service; and empathy, which involves the organization's care and individualized attention to customers, including accessibility, communication, and understanding their needs (Zeithaml, Berry, & Parasuraman, 1996).

Service quality is a critical component of these models and has been demonstrated to positively influence customer satisfaction (Cronin et al., 2000; Oliver, 1997). Previous research suggests that customers' positive behavioral intentions are a result of their satisfaction with the company, which is directly linked to the provision of high-quality service. Satisfaction plays a crucial role in mediating the impact of service quality on behavioral intentions (Dabholkar et al., 2000). Recent literature continues to support these findings, emphasizing that service quality—encompassing dimensions such as reliability, assurance, tangibles, empathy, and responsiveness—remains a pivotal factor in driving customer satisfaction (Johnson & Smith, 2021). Businesses that focus on these components can better connect their services with the demands of their customers and generate long-term happiness and loyalty.

Numerous researchers have explored the concept of service quality from the perspective of the customer over the past several decades (Zeithaml, 2009; Ramsaran-Fowdar, 2007). Customers possess diverse values, evaluation criteria, and situational contexts, so it is essential to approach the concept of service quality with a broad perspective (Chang, 2008). Customer satisfaction is critically determined by service quality; high-quality services have been shown to significantly enhance customer satisfaction, whereas low-quality services have the opposite effect. It is consistently demonstrated by the literature that service quality is one of the most influential factors affecting customer satisfaction (Cronin et al., 2000; Oliver, 1997). Various studies have well-documented the relationship between customer satisfaction and service quality (Zeithaml et al., 2003; Cronin & Taylor, 1992; Fernandes et al., 2017; Zaibaf et al., 2013; Zeithaml et al., 1996; Zhang & Prybutok, 2005).

Customer satisfaction and overall business success are critically influenced by service quality, which encompasses various dimensions, including reliability, tangibles, assurance, responsiveness, and empathy.

While a strong positive relationship between service quality and customer satisfaction has been established by numerous studies, the broader implications of service quality for businesses, including its impact on reputation, customer loyalty, and market opportunities, are the focus of this summary.

Perceived value

In contemporary business sectors, delivering optimal value to customers is a significant management challenge. Service value is defined by the user's overall assessment of a service's utility, based on the perceived benefits relative to the costs incurred (Zeithaml, 1998). It has been consistently demonstrated by research that perceived value positively influences customer satisfaction (Gallarza & Saura, 2006). Perceived value represents a paradigm shift, offering a more comprehensive approach than focusing solely on quality or service satisfaction, and it has broader implications beyond immediate behavioral relevance (Martinez-Ruiz et al., 2010).

Customer satisfaction and perceived value are key determinants of subsequent customer actions in the restaurant industry (Tam, 2004). Another finding from Kim & Tang, (2020), customer behavior exerts a more substantial influence on perceived value within the restaurant industry compared to participation behavior, providing valuable insights for the development of effective marketing strategies. The fulfillment of input requirements necessary for satisfaction is intrinsically linked to value, establishing a strong positive correlation between perceived value and customer satisfaction (Rust & Oliver, 1994). Similarly, that increase in perceived value corresponds to higher levels of customer satisfaction (Cuong & Khoi, 2019). According to Kumar & Reinartz (2016), marketing efforts must be strategically oriented toward creating perceived value for customers and optimizing customer lifetime value to cultivate loyalty, satisfaction, and ultimately, profitability.

Customer satisfaction and subsequent behaviors are critically influenced by perceived value, which is derived from the assessment of benefits received relative to costs incurred by the customer. Research consistently demonstrates a strong positive relationship between perceived value and customer satisfaction. Although customer behavior also impacts perceived value, focusing on creating perceived value is essential for driving customer loyalty and long-term profitability.

Trust

Trust is defined as the ability to foster comfort, accumulate positive experiences, and sustain continuous communication, all of which contribute to building strong future relationships (Lestariningsih, Hadiyati, and Astuti, 2018). It is emphasized by Reichheld and Schefter (2000) that to gain customer loyalty, their trust must first be gained. The importance of customer trust in business cannot be overstated, as it is fundamental to cultivating customer loyalty. Trust not only underpins loyalty but also plays a crucial role in reducing perceived risk (Hansen et al., 2018). A business must continually evolve to maintain the trust customers have placed in its products and services; without this trust, customer loyalty is at risk of being lost.

The critical role of trust in customer relationships has been underscored by recent literature. A meta-analysis cited in Zhang, & Roberts (2024), reveals that integrity-based antecedents are more effective in driving trust compared to reliability-based ones. Positive behavioral intentions, including repurchase intentions and word-of-mouth recommendations, are predicted by trust and satisfaction, as noted by Kumar & Patel (2023). Businesses that successfully establish and preserve trust are better positioned to encourage long-term consumer loyalty and lower perceived risks associated with their products and services.

In the study of consumer and interpersonal relationships, trust is a factor that commands significant attention Barnes (2003). Trust is most significantly influenced by the perceived quality of service (Lupiyoadi, 2006). It has been demonstrated by another study that both trust and loyalty among consumers are profoundly impacted by customer satisfaction (Cuong & Khoi, 2019). Trust significantly enhances attitudinal outcomes such as loyalty and customer satisfaction (Liang, 2022). In the context of service quality, perceived quality remains a critical determinant of trust. Increased customer loyalty and positive word-of-mouth are results of high service quality, as shown by studies (Leninkumar, 2017). Strong customer relationships and long-term business success are ensured by the crucial interaction between trust and satisfaction (Yong, 2021).
Trust is a critical component of customer relationships and a precursor to loyalty, influenced by factors such as service quality and customer satisfaction. Building and maintaining trust requires ongoing effort and a focus

on meeting customer expectations.

3. Research Methodology

The study employs a correlational analysis to examine the relationships between service quality, perceived value, product quality, and trust, perceived value, trust, and customer satisfaction. A quantitative research method was employed by the study, involving the collection and analysis of numerical data to understand patterns, relationships, or trends within a population. Primary data was gathered directly from the source, ensuring the information was specific to the research objectives. The study collected data through surveys and questionnaires. The study surveyed 220 customers from three major convenience store chains in Bentong City: 7-Eleven, KK Super Mart, and 99 Speed Mart. With a total population of 52,489 in Bentong City, the sample size of 220 respondents was selected to provide a representative cross-section of the population. The study used non-probability convenience sampling, selecting respondents based on their availability and willingness to participate rather than through random selection. This method is often used for its practicality and ease of access to participants. The study collected data through online questionnaires distributed to customers of convenience stores in Bentong City. This approach allowed for efficient data collection, effectively reaching a broad audience in a timely and convenient manner.

The Statistical Package for the Social Sciences (SPSS) Version 25, recognized for its comprehensive capabilities in tabulating academic research, particularly in quantitative studies, is utilized in the analysis (Rowley, 2014). The study employs multiple regression analysis to test the hypotheses, evaluating how well a set of variables predicts a specific outcome, identifying the most significant predictor, and assessing whether a particular predictor variable maintains its predictive power when accounting for the effects of other variables.

4. Results

The demographic table provides a comprehensive overview of the respondents' characteristics, including gender, age, occupation and education level. This table details the distribution of respondents across various demographic categories, offering insights into the composition of the sample population.

Table 1: Demographic profile

VARIABLE	FREQUENCY	PERCENTAGE
Males	70	31.8
Females	150	68.2
18-23 years old	48	21.8
24-29 years old	115	52.3
30-34 years old	13	5.9
35-39 years old	9	4.1
40-44 years old	10	4.5
45-49 years old	7	3.2
50-54 years old	7	3.2
55 years & above	11	5.0
Single	150	68.2
Married	70	31.8
7-Eleven	67	30.5
KK Super Mart	7	3.2
99 Speed Mart	126	57.3
Other	20	9.1

Table 1 presents a demographic profile of the study population, categorized by gender, age, marital status, and preferred convenience store. Gender Distribution, the data reveals a predominantly female population, with females accounting for 68.2% of the sample compared to 31.8% males. For age distribution, the majority of respondents fall within the 24-29 age group, constituting 52.3% of the sample. This demographic is followed

by the 18-23 age group at 21.8%. The data indicates a relatively young population, which could be relevant for targeting products or services accordingly. Marital Status, the table shows a higher proportion of single individuals (68.2%) compared to married individuals (31.8%). This information can be useful for tailoring marketing campaigns or product offerings to specific lifestyle segments. As for convenience store preference, 99 Speed Mart emerges as the most preferred convenience store, with 57.3% of respondents indicating it as their choice. 7-Eleven follows closely with 30.5%, while other options like KK Super Mart and "Other" hold relatively smaller market shares. This analysis provides insights into consumer preferences in the convenience store sector. Overall, the data presents a demographic profile skewed towards young, single females. The preference for 99 Speed Mart is a notable finding. Further analysis, potentially incorporating geographic or socioeconomic factors, could provide additional valuable insights.

Table 2: Analysis of the Correlation Matrix

	Product Quality	Service quality	Perceived value	Trust
Customer satisfaction	**0.676****	**0.750****	**0.806****	**0.829****

***. Correlation is significant at the 0.01 level (2-tailed).*
**. Correlation is significant at the 0.05 level (2-tailed).*

Product Quality and Customer Satisfaction (r = 0.676)**: A strong positive relationship is indicated by the correlation of 0.676 between Product Quality and Customer Satisfaction, suggesting that as product quality improves, customer satisfaction tends to increase significantly. The high correlation indicates that customers value the quality of the products they purchase, and their satisfaction is closely tied to their perception of this quality. Companies that prioritize product quality are likely to see a direct impact on customer satisfaction, making this a key area for businesses to focus on.

*Service Quality and Customer Satisfaction (r = 0.750)***: Service Quality has an even stronger correlation with Customer Satisfaction, at 0.750. This shows that the quality of service provided is a crucial determinant of how satisfied customers are. Customer satisfaction with their overall experience is more likely when high-quality service is received, even if other factors such as product quality are not as strong. This highlights the importance of investing in customer service training, support infrastructure, and service delivery processes to ensure that customers have positive interactions with the company.

*Perceived Value and Customer Satisfaction (r = 0.806)**:* The highest correlation with Customer Satisfaction is shown by Perceived Value, at 0.806, suggesting that the perception of value received from a product or service is the most influential factor in determining customer satisfaction. Perceived value encompasses the balance between what the customer receives (in terms of quality, benefits, and satisfaction) and what they give up (in terms of price, effort, and time). A high perceived value indicates that customers feel they are getting a good deal, which strongly correlates with their overall satisfaction. Higher levels of customer satisfaction are likely to be seen by companies that can enhance perceived value, whether through competitive pricing, superior quality, or added benefits.

*Trust and Customer Satisfaction (r = 0.829)**:* The strongest correlation with Customer Satisfaction, at 0.829, is shown by trust, indicating that trust is a critical factor in ensuring customer satisfaction. Trust involves the customer's confidence in the company's products, services, and overall brand. High levels of trust mean that customers believe the company will deliver on its promises, which leads to higher satisfaction. Building and maintaining trust requires consistency, transparency, and reliability. Companies that focus on creating trustworthy relationships with their customers are likely to see the highest levels of satisfaction.

The analysis of the correlations shows that Customer Satisfaction is most strongly influenced by Trust, followed by Perceived Value, Service Quality, and Product Quality. Trust and Perceived Value stand out as the most critical factors, suggesting that customers place a high premium on their confidence in the company and the perceived benefits they receive. Service Quality and Product Quality are also important, but they play a slightly less significant role compared to Trust and Perceived Value.

To enhance customer satisfaction, building and maintaining trust with customers should be prioritized by companies. Companies can achieve this through consistent and transparent communication, delivering on

promises, and providing reliable products and services. Additionally, companies should focus on enhancing perceived value by offering high-quality products and services at competitive prices or by providing additional benefits that customers perceive as valuable. Investing in service quality is also essential, as positive service experiences are closely tied to customer satisfaction. Higher levels of customer satisfaction and long-term customer loyalty can be fostered by focusing on these areas.

Discussion

Trust was identified as the primary determinant of customer satisfaction among the four variables examined, based on the quantitative analysis of this study. A significant positive relationship between customer satisfaction and trust was established by Leninkumar (2017), positing customer satisfaction as a precursor to trust, which aligns with this finding. A positive correlation with customer satisfaction was demonstrated by service quality and perceived value, collectively contributing significantly to overall customer satisfaction levels.

The critical role of customer satisfaction in business success is underscored by previous research. Increased purchasing behavior (Davras & Caber, 2019; Gerdt et al., 2019), repeat business (Razak & Shamsudin, 2019), and loyalty rooted in trust (Hasim, Shamsudin, Ali, & Shabi, 2018) are exhibited by satisfied customers. Moreover, they demonstrate a willingness to pay a premium (Mohd Farid Shamsudin, Ali, Wahid, & Saidun, 2019), ultimately driving sales and profitability (Razak & Shamsudin, 2019). These findings collectively emphasize the paramount importance of customer satisfaction in the business context. Several factors influencing customer satisfaction in convenience stores were identified by this study, but product quality did not exhibit a significant relationship with customer satisfaction, suggesting it is a potential area for improvement.

According to the study, customer satisfaction in convenience stores is primarily driven by trust. While service quality and perceived value also positively influence satisfaction, product quality, surprisingly, does not. Satisfied customers are more likely to make repeat purchases, remain loyal, and spend more, underscoring the significance of customer satisfaction for business success. The study suggests that enhancing product quality could be a potential opportunity to further increase customer satisfaction in convenience stores.

Future Research

To expand upon the current findings, future research could incorporate additional variables to provide novel insights. A broader exploration of diverse variables would enhance our comprehension of consumer behavior's impact on convenience store satisfaction. This approach would offer a more comprehensive perspective on how various factors interact within the broader business landscape in Malaysia. Given the limitations of a single location, Bentong, future studies should consider a larger geographical scope, such as the state or national level, to increase sample size and improve research quality. Expanding the study to include additional convenience store brands, as suggested by Tran & Le (2020), would further enhance reliability. To optimize survey response rates and data quality, researchers could refine question wording to better capture respondent attention and understanding. Leveraging the advantages of online research, as highlighted by Wright (2005), including cost-effectiveness, time efficiency, and wide reach, can be advantageous.

Future research should explore why product quality did not significantly impact customer satisfaction and investigate how trust mediates the relationship between service quality, perceived value, and satisfaction. Conducting longitudinal studies will help examine changes in customer satisfaction over time. Additionally, expanding research to various retail environments beyond convenience stores can provide comparative insights. Analyzing customer satisfaction across different demographic groups will enable the development of targeted strategies while examining the influence of online interactions on trust, satisfaction, and loyalty is essential. Lastly, considering external factors, such as economic conditions or cultural influences, will enhance understanding of their effects on trust and customer satisfaction

5. Managerial Implications and Recommendations

The correlation analysis underscores the intricate relationship between perceived value, service quality, trust, and customer satisfaction. These factors collectively influence customer loyalty and overall business

performance. To optimize customer satisfaction, organizations must prioritize delivering exceptional service experiences, building strong customer relationships based on trust, and consistently exceeding customer expectations. A customer-centric approach is essential. By investing in employee training, leveraging technology for efficiency, and actively seeking customer feedback, businesses can enhance service delivery and foster customer loyalty. It's crucial to recognize the interconnectedness of these factors. Improvements in one area can positively impact others, creating a virtuous cycle of customer satisfaction and business growth.

Conclusion

The analysis highlights the crucial role of service quality, perceived value, trust, and customer satisfaction in driving business success. These factors are intricately linked, and improvements in one area can positively impact others. Organizations that prioritize customer experience, foster trust, and continuously measure performance are more likely to achieve sustained growth and customer loyalty. A competitive advantage in today's customer-centric marketplace can be created by adopting a holistic approach that considers the interconnectedness of these elements.

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Examining the Effects of E-Satisfaction, E-Trust and Perceived Value on Repurchase Intention among Young Adults

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Abstract: This study adapted some of the dimensions in the ES-QUAL model that contribute to e-satisfaction, with additional factors of e-trust and perceived value about repurchase intention among young adults in an online shopping setting. The research methodology involved a sample size of 103 full-time students of Bachelor of Business Administration (BBA) Retail Management (Hons.) in UiTM Puncak Alam aged between 18 to 26 years old, utilizing a structured adapted questionnaire to capture demographic profiles and components of e-satisfaction, e-trust and perceived value about repurchase intention. The descriptive statistics show a substantial increase, with the highest mean obtained by e-satisfaction, followed by perceived value and e-trust. In addition, the finding implies that there is a high degree of repurchase intention among these students.

Keywords: *Online shopping, e-commerce, e-satisfaction, e-trust, perceived value, repurchase intention*

1. Introduction and Background

Online shopping, also known as e-commerce, is the practice of making purchases of goods and services using the internet. While online buying was already common before the pandemic struck, it has unavoidably taken the lead and grown to be the most favored method of payment for the great majority of individuals (Maheshwari, 2023). The biggest benefit of this kind of shopping is that it can be finished in a matter of minutes by just clicking a tab, from the comfort and convenience of your own house or anyplace else. Customers can shop from the comfort of their homes by browsing online catalogues, comparing prices, reading reviews, and making purchases using a computer, smartphone, or other internet-enabled device in place of going to physical stores.

Even so, there are still certain issues with online buying in our nation, even though people adore it. According to a survey conducted by Parcel Perform and meta-search engine iPrice Group, 43% of Malaysian customers are dissatisfied with their e-commerce delivery experience (Bernama, 2019). Malaysia has the longest transit time in the region, taking 5.8 days for deliveries, while the average for the region is 3.3 days, according to the poll. Unsatisfactory shipment and delivery might lead to unhappy customers. This could deter clients from making additional online purchases. The findings of earlier research by Trivedi & Yadav (2020) and Kazancoglu & Demir (2021) indicate that contentment has a major influence on repurchase intention.

Furthermore, paid-for fake review businesses have penetrated major websites including Google, Facebook, and Trustpilot (The Star, 2022). People who are swayed by bogus reviews will purchase the things they are interested in, which will leave them disappointed because their expectations were not met. Previous research by Trivedi & Yadav (2020) and Purnamasari & Suryandari (2023) indicates that trust positively influences repurchase intention. Customers are more inclined to repurchase a good or service in the future when they have faith in it.

Repurchase intention, which refers to whether a consumer intends to make additional purchases from the same online retailer, is significant when it comes to online purchasing (Javed & Wu, 2020). Consumers are more likely to want to return to a website that is user-friendly and has a positive atmosphere. Trust is also important; consumers are more likely to stay with an online store if it seems secure and communicates honestly. According to earlier research, two important components of website loyalty are satisfaction and trust (Mahadin, Akroush, & Bata, 2020). Additionally, finding product ratings and information quickly improves a consumer's online buying experience and encourages him or her to return for more.

Repurchase intentions are a person's assessment of whether to repurchase a specific service from the same business. It is the likelihood that customers will consistently buy goods and services from the same online merchant, according to research definitions (Quan, Chi, Nhung, Ngan & Phong, 2020). Customer repurchase intention is significantly influenced by satisfaction and attitude, according to several studies (Bearden & Teel, 1983; Oliver, 1981; Roest & Pieters, 1997). It is an important marketing metric that evaluates the probability that customers will remain loyal to a specific brand. Numerous product and service research corroborate the direct positive association between customer satisfaction and repurchase intention (Anderson & Sullivan, 1993).

According to the Hand Phone Users Survey 2021 published by the Malaysian Communications and Multimedia Commission, 35.3% of Malaysian handphone users were youth aged 15-24 years old, making them quite a lucrative market to tap into despite that not much is known about this group's consumer behavior. To further understand these young adults' consumer behavior while shopping online, this study adapted some of the dimensions in the ES-QUAL model that contribute to e-satisfaction with additional factors of interest namely e-trust and perceived value about repurchase intention among the young adults. As a result, the correlations between customer satisfaction, perceived value, and trust and their intention to make another purchase will be made clear by this study.

2. Literature Review

The relationship between e-satisfaction positively influences the intention to repurchase via an e-commerce platform.

E-satisfaction is the amount of satisfaction a client feels when dealing with an online platform, website, or electronic service. It includes aspects such as website usability, product information, navigation ease, customer service, and overall user experience. When a customer is happy with their past purchase they can repurchase the product. According to Ali, Ali, ur Rehman, Yilmaz, Safwan & Afzal (2010), the cost of obtaining a new client is seven times that of sustaining an existing one. Research by Kazancoglu & Demir (2021); Trivedi & Yadav (2020); and Cunningham & De Meyer-Heydenrych (2021) all resulted in saying that customer satisfaction influences repurchase intention. Purani, Kumar & Sahadev (2019) also agreed that acquiring customers for online stores is more difficult than traditional outlets. Research by Tata, Prashar & Parsad (2021) found that there is a positive influence between satisfaction and repurchase intention. When purchasing items online, there is a probability of not receiving items as ordered and it is important for sellers to ensure customers are satisfied with their purchase because it will cost more to attract new customers compared with having a loyal customer. Besides that, a good web design can also influence customer satisfaction, however according to research by Haq & Awan (2020), it cannot lead to repurchase intention. According to Thakur (2019), the finding shows the effect of satisfaction on continuance intention is stronger among customers with higher levels of engagement. Bello, Jusoh & Md Nor (2021) stated that customer satisfaction positively influences consumer repurchase intention.

Al Amin, Arefin, Sultana, Islam, Jahan & Akhtar (2020) and Liu, Guo & Huang (2023) investigated consumers that use mobile food ordering apps (MFOA) and found that customer satisfaction with MFOAs is positively related to continuance intention. Khan, Zubair & Malik (2019); Demirbaş, Gültekin Salman & Uray (2022); Purnamasari & Suryandari (2023) and Riorini & Samia (2024) studies indicate that e-customer satisfaction and e-customer loyalty is significantly influencing repurchase intention. The relationship between e-satisfaction and repurchase intention is vital for online business success. Providing a pleasant and gratifying online experience may lead to greater consumer loyalty, repeat purchases, and positive word-of-mouth, all of which contribute to an e-commerce platform's long-term success. As a result, in ten collective journals findings from various studies indicate that only two out of ten journals that show e-satisfaction and repurchase intentions are not significant because web design satisfaction cannot influence customer repurchase intention. As a result, the subsequent hypothesis is posited:

H1: *E-satisfaction positively influences the intention to repurchase via an e-commerce platform*

The relationship between e-trust positively influences the intention to repurchase via an e-commerce platform

A consumer who possesses a high level of trust in a specific e-retailer may choose to endorse and suggest said e-retailer to other potential customers. Therefore, it is possible to observe a positive correlation between trust, commitment, and word of mouth. Prior studies have proven that there exists a noteworthy correlation between trust and consumers' behavioral intention. This finding emphasizes the significance of fostering original and repurchase intention, as well as promoting word-of-mouth referrals. Trust can be established when the various aspects of security, privacy, ease of use, and other elements associated with making a transaction have been adequately addressed (Trivedi & Yadav, 2020). According to Della Prisanti (2017), there is a prevailing expectation among online consumers for online sellers to demonstrate responsiveness and commitment to consumer interests, uphold transactional integrity, fulfill promised goods and/or services, and offer reliable electronic services. These factors collectively contribute to the establishment of a comfortable transactional environment for online consumers.

According to Pradnyaswari & Aksari (2020), e-commerce platforms and online sellers must furnish comprehensive, lucid, and precise information to instill a sense of priority toward delivering high-quality online services. This approach is crucial in cultivating client trust and enhancing the credibility of the website. The purchasers of e-commerce platforms heavily depend on the information provided by the sellers through the website. To secure the trust and buy intentions of website users, e-commerce entities must deliver superior quality and service. This necessitates the provision of exceptional customer experiences, hence fostering a positive perception of the brand and encouraging repeat purchases. The study was conducted by Pardede, Lapian & Pandowo (2018) to identify the relationship between e-trust in-service performance and its impact on buyers' repurchase intention in the context of e-commerce. The findings indicate that a high level of e-trust in service performance positively influences customers' satisfaction and subsequently increases their desire to repurchase from the e-commerce platform. The significance of the effect of e-trust mediation on the link between e-service quality and e-repurchase intention has been established in a previous study conducted by Santoso & Aprianingsih (2017); Budi, Isyanto & Romli (2024) and Afridhianika, Harisudin & Handayani (2024). Hence the hypothesis proposed:

H2: *E-trust positively influences the intention to repurchase via an e-commerce platform*

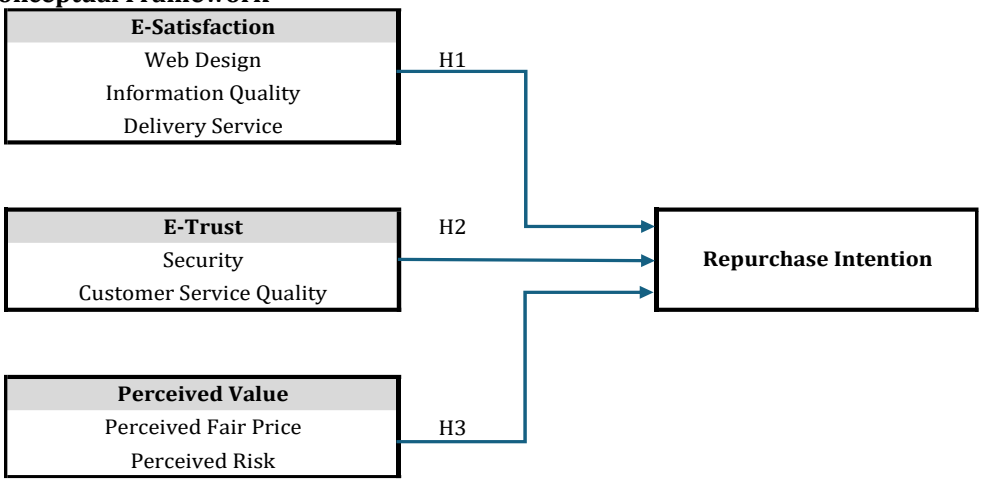
The relationship between perceived value positively influences the intention to repurchase via an e-commerce platform.

Perceived value, defined as the perceived benefits relative to the cost of a product or service, plays a significant role in influencing consumers' repurchase intentions. Numerous studies have established a positive relationship between perceived value and repurchase intention in various industries and contexts (Dodds, Monroe & Grewal (1991); Sweeney & Soutar (2001). Customers tend to form repurchase intentions when they perceive higher value in their purchase experiences. Dodds et. al. (1991) found that consumers who perceive a higher value in products or services are more likely to express intentions to repurchase. This aligns with the notion that when the perceived benefits derived from a product or service outweigh the perceived costs, customers are more inclined to engage in repeat purchases. Moreover, Sweeney & Soutar (2001) emphasized the significance of perceived value in building customer loyalty and fostering repurchase intentions. They highlighted that a positive perception of value not only influences initial purchases but also contributes to sustained patronage and repeat buying behavior. These findings underscore the important role of perceived value as a determinant factor influencing consumers' repurchase intentions across diverse industries. Similar findings were documented in the work of Oktaviani (2024) and Zeqiri, Ramadani & Aloulou (2023). Businesses that prioritize delivering perceived value to customers are more likely to witness increased loyalty and higher repurchase intentions among their customer base. From the above review, this hypothesis is formulated:

H3: *Perceived value positively influences the intention to repurchase via an e-commerce platform*

Conceptual Framework: Figure 1 shows the conceptual framework proposed for this study based on the reviewed literature.

Figure 1: Conceptual Framework



3. Research Methodology

Measures

The research utilized an online self-administered survey to gather the data. Google Form was used to deliver a research survey questionnaire and collect data online, where respondents rate their agreement or disagreement with some types of statements regarding the relationship between e-commerce and consumer behavior (Taherdoost, 2019). The research instrument was designed to capture demographic profiles and explore various components of shopping behavior, namely e-satisfaction, e-trust, perceived value, and repurchase intention using a Likert scale. Miao, Jalees, Zaman, Khan, Hanif & Javed (2022) identified that the components of the relationship consist of e-satisfaction (web design, information quality, delivery service), e-trust (security, customer service quality), and perceived value (perceived fair price, perceived risk). E-commerce shopping behavior can be determined by customers' experiences with service, quality of product, security, information availability, shipping, pricing, and time while shopping online (Vasić, Kilibarda & Kaurin, 2019). Five-point Likert scales, with one denoting "strongly disagree" and five denoting "strongly agree," were used to rate the items.

Data Collection

Convenience sampling was used in this research to gather data from Bachelor of Business Administration (BBA) Retail Management (Hons.) full-time students at UiTM Puncak Alam from semester one to semester six, with a total of 146 population. Based on Krejcie & Morgan (1970), the closest population to us is N=140 hence the sample size of 103 students. To make data collecting easier, an existing questionnaire from the work of Miao et. al. (2021) was adopted. The questionnaire, chosen for its relevance to the research objectives, was disseminated to participants via Google Forms, which provided a simple and accessible platform for response submission. The form was distributed by using WhatsApp. Before distribution, all required consents were obtained, participants were told about the goal of the research, and informed consent was sought where needed. While the sample size might limit the scope of generalization, it allowed for a comprehensive analysis of the targeted population's perceptions and behaviors regarding e-commerce and online shopping.

Data Analysis

The computer software Statistical Package for the Social Sciences (SPSS) version 26 was used to do several empirical analyses. The conducted analysis included correlation analysis, reliability test, normality test and descriptive analysis.

4. Results

Demographic Profile of Respondents: Table 1 shows the demographic of the participants. The data reveals that the female respondents constituted the majority, accounting for 51.5 percent of the total 103 respondents. Out of the entire sample size of 103 participants, the majority (71.8%) were 21 to 23 years old. The survey

participants were only selected from a particular degree program of Bachelor of Business Administration (BBA) Retail Management (Hons.) based in UiTM Puncak Alam. Finally, 35.9 percent of respondents were in Semester 5, followed by Semester 3 (28.2%), Semester 1 (20.4%), Semester 2 (6.8%), Semester 6 (4.9%) and Semester 4 (3.9%). As for the preferred e-commerce platform, 74.8 percent of the respondents chose Shopee, followed by Lazada (8.7%), SHEIN (6.8%), Zalora (3.9%), and other e-commerce platforms (5.8%).

Table 1: Demographic

		Frequency	Per cent
Gender	Female	53	51.5
	Male	50	48.5
Age	18 – 20 years	21	20.4
	21 – 23 years	74	71.8
	24 – 26 years	8	7.8
Degree Program	Retail Management	103	100.0
Semester	1	21	20.4
	2	7	6.8
	3	29	28.2
	4	4	3.9
	5	37	35.9
	6	5	4.9
Preferred E-Commerce Platform	Shopee	77	74.8
	Lazada	9	8.7
	SHEIN	7	6.8
	Zalora	4	3.9
	Others	6	5.8
	Total	103	100.0

Analysis of Reliability: The study employed Cronbach's Alpha as a reliability coefficient to precisely assess the consistency of the utilized scales. Table 2 demonstrates that Cronbach's alpha values for variables in the research are at an acceptable level exceeding 0.70. Consequently, all of the items are suitable for measuring the variables of interest.

Table 2: Reliability Analysis

Construct	Cronbach's Alpha	Internal Consistency
E-satisfaction	0.939	Excellent
E-trust	0.924	Excellent
Perceived value	0.906	Excellent
Repurchase intention	0.909	Excellent

Normality Test: Table 3 indicates whether normality is assumed based on skewness and kurtosis values. Since all variables have skewness and kurtosis values within the recommended ranges, normality is assumed for each variable. Kline (2005) suggests that skewness values within the range of +/- 3 and kurtosis values within the range of +/- 10 are generally acceptable for assuming normality. In this table, all skewness and kurtosis values fall within these suggested ranges. Therefore, based on Kline's criteria, it can be concluded that the distributions of e-satisfaction, e-trust, perceived value, and repurchase intention are reasonably close to normal.

Table 3: Findings of the Normality Test

Construct	Skewness	Kurtosis	Normality Assumed
E-satisfaction	-0.536	-0.573	Yes
E-trust	-0.259	-0.209	Yes
Perceived value	-0.182	-0.989	Yes
Repurchase intention	-0.36	-1.027	Yes

Descriptive Analysis of the Variable: Table 4 shows the means for variables measured by a 5-point Likert scale. E-satisfaction recorded the highest mean of 4.2727, followed by perceived value with a mean of 4.1650 while the lowest mean of 3.9137 is for e-trust. Additionally, repurchase intention resulted in a mean of 4.2880.

Table 4: Descriptive Analysis

Item ID	Construct	Mean	Level
ES	E-satisfaction	4.2727	High
ET	E-trust	3.9137	High
PV	Perceived value	4.1650	High
RI	Repurchase intention	4.2880	High

Correlation Analysis: Table 5 is a representation of the correlation matrix, which is made up of Pearson correlations. These correlations reflect the inter-correlation that exists between the variables that were investigated. It is clear from the table that there is a significant correlation between each of the factors that were investigated in this study. According to these findings, the constructs have a discriminant validity, which means that although they are connected, they do not overlap with one another. In this study, repurchase intention is most strongly correlated with perceived value ($r = 0.524$, $p < 0.01$), followed by e-satisfaction ($r = 0.519$, $p < 0.01$) and e-trust ($r = 0.485$, $p < 0.01$).

Table 5: Pearson Correlation

Relationship	Pearson Correlation	Strength	Direction
E-satisfaction with repurchase intention	0.519**	Moderate	Positive
E-trust with repurchase intention	0.485**	Moderate	Positive
Perceived value with repurchase intention	0.524**	Moderate	Positive

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Discussion

The analysis from this study implies that the intention of retail management students to repurchase via e-commerce platforms is influenced by e-satisfaction, e-trust and perceived value factors. Additionally, the findings were also parallel with the previous studies related to the variables. The findings also showed that the respondents were experiencing a high level of repurchase intention.

Prior studies have shown that consumers' intentions to make additional purchases when they buy online are significant because they help online businesses. Repurchase intentions and customer loyalty are closely related in certain research (Jiang & Rosenbloom, 2005). Khan et. al. (2019); Demirbaş et. al. (2022); Purnamasari & Suryandari (2023); and Riorini & Samia (2024) studies indicate that e-customer satisfaction and e-customer loyalty are significantly influencing repurchase intention. Moreover, a study conducted by Reichheld, Markey Jr & Hopton (2000) revealed that it takes an average customer four purchases at an online store for the business to make a profit from them. Furthermore, consumers find online shopping enjoyable enough to motivate them to return to an online retailer (Ahn, Ryu & Han, 2007; Koufaris, 2002). Since keeping current clients is typically more cost-effective than obtaining new ones, internet shoppers who make recurring purchases save money on marketing.

When an online store surpasses its expectations, customers are more likely to anticipate future purchases from that merchant, which promotes satisfaction and repurchase intention (Kotler & Armstrong, 2010). The term "e-repurchase intention" in Javed & Wu (2020) refers to this intention, which is impacted by information quality, which includes correctness, relevance, and completeness from the perspective of the consumer (Patrada & Andajani, 2020). Research, such as Mahadin et. al. (2020), emphasized that e-satisfaction and e-trust are critical factors influencing repurchase intention that eventually leads to e-loyalty. Additionally, in the context of online retailers, perceived value—which is shaped by delivering more than promised—contributes to consumer happiness and is a major factor in repurchase intention.

Influential studies such as Zeithaml (1988) laid the groundwork by defining perceived value and its relation to consumer behavior, while others like Dodds et. al. (1991) further extended these concepts to focus on the role of price and quality perceptions in which consumers who perceive a higher value in products or services are more likely to express intentions to repurchase. A similar finding was also documented in the work of Salem & Alanadoly (2022).

5. Managerial Implications and Recommendations

The digital landscape's rapid evolution has profoundly impacted consumer behavior, emphasizing the importance of understanding key factors like e-satisfaction, e-trust, perceived value, and repurchase intention in e-commerce. E-commerce managers must prioritize user-friendly interfaces and reliable post-purchase services to enhance e-satisfaction. However, while personalization enhances user satisfaction, it raises privacy concerns, creating a challenging balance for businesses (Pappas, Kourouthanassis, Giannakos & Lekakos, 2017). Online businesses may enhance their security protocols, invest in user-centric website design, improve customer support systems and balance personalization with privacy.

On the other hand, e-trust is vital for reducing consumer risk perception and fostering repeat business (Gefen, 2000). Essential elements include data security, privacy policies, and transparent communication. This study underscores the critical role of e-trust in the digital landscape. The implications of e-trust are far-reaching, influencing user engagement, satisfaction, and loyalty. Key recommendations for future research include adopting comprehensive methodologies, exploring underrepresented factors such as user experience and transparency, and considering context-specific elements. By addressing these areas, scholars and practitioners can develop more effective strategies to foster e-trust, ultimately enhancing the digital ecosystem's reliability and efficiency.

Perceived value plays a critical role in shaping consumer behavior and business outcomes in online shopping. The reviewed literature revealed that perceived value, encompassing quality, price, and consumer benefits, is a predictor of purchase decisions (Zeithaml, 1988). Therefore, managers can enhance perceived value through value-added services and personalized experiences. In addition, this review also highlights the need for ongoing research to address existing gaps, particularly in the areas of diverse consumer preferences and rapidly evolving technologies. Practical recommendations include optimizing website usability, fostering positive shopping experiences, leveraging social influence, offering competitive pricing, and streamlining transaction processes to enhance perceived value.

Overall, a critical evaluation of the literature reveals several recurring themes and methodologies in the study of e-satisfaction, e-trust and perceived value of repurchase intention in a digital setting. Many studies adopt a quantitative approach, utilizing surveys and regression analysis to elucidate the relationship between e-satisfaction, e-trust, and perceived value dimensions and consumer behavior, particularly repurchase intention. While these methods provide valuable insights, they often lack depth in understanding the underlying psychological mechanisms. Additionally, there is a tendency for studies to focus on specific demographics, leaving gaps in our understanding of diverse consumer groups. Furthermore, the rapid technological changes in e-commerce necessitate continuous updates to theoretical models and empirical evidence.

Conclusion

Tested variables of e-satisfaction, e-trust and perceived value were found to significantly influence repurchase

intention across various contexts. However, future research should address existing gaps, particularly in the areas of technological impact and emerging markets, to provide a more comprehensive understanding of this critical consumer behavior factor.

E-satisfaction is a multifaceted construct influenced by various technical and psychological factors. By addressing the themes and responding to debates, businesses can refine their e-commerce strategies to foster customer loyalty and enhance satisfaction. Further research should focus on emerging technologies and their impact on consumer satisfaction, particularly considering evolving consumer expectations and technological advancements. The concept of e-trust has garnered significant scholarly attention in recent years, particularly as digital interactions become increasingly integral to everyday life. E-trust encompasses various factors such as security (robust security measures are fundamental in establishing e-trust), privacy (ensuring user privacy significantly enhances trust in digital platforms), user experience (well-designed user interfaces and seamless interaction boost trust), and transparency (transparent policies and practices foster greater user trust).

The relationship between perceived value and repurchase intention in e-commerce is a complex and multifaceted phenomenon that has garnered significant attention in the literature. A study by Ramayah, Rahman & Ling (2018) provides insights into the influence of psychological factors on online purchase intention, particularly among the younger generation in Malaysia. Additionally, the work of Ahmed, Hussain, Jafar, Latif, Sultan & Jian Zhou (2017) emphasizes the significant positive effect of e-service quality on perceived value and purchase intention in online shopping. The study underscores the importance of e-service quality in enhancing perceived value, ultimately leading to higher purchase intention among e-shoppers. These findings contribute to a deeper understanding of the intricate interplay between perceived value and repurchase intention in the e-commerce context. Hence, understanding the multifaceted nature of perceived value which encompasses functional, emotional, social, monetary, and convenience dimensions is essential for e-commerce businesses seeking to enhance customer satisfaction and loyalty.

In a nutshell, delving into contemporary research within the e-commerce domain would further enrich our understanding, offering more nuanced and up-to-date insights into the prevailing consensus on this intricate relationship.

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Halal Purchasing Strategies of MSEs in the Malaysian Food Industry: An Exploratory Study on the Potential Use of CAQDAS in the Qualitative Evaluation of Multiple Case Studies

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Abstract: This paper explores the potential of computer-assisted qualitative data analysis software (CAQDAS), specifically Nvivo 14, in facilitating the qualitative evaluation of multiple case studies. The focus is on halal purchasing strategies within micro and small enterprises (MSEs) in the food industry, a critical issue from a Shariah perspective that ensures halal integrity from source to consumer. The issue highlights that MSE leaders in Malaysia's food industry failed to optimize halal purchasing in their management practices, which undermines their ability to increase probability. The objective is to explore the strategies for optimizing halal purchasing performance of MSEs in Malaysia's food industry, on how these businesses navigate the requirements of halal compliance in their operational practices. Through an exploratory study, 10 MSEs were examined to investigate their halal purchasing structures, involving interviews with key stakeholders such as brand owners, company directors, halal executives, and CEOs. In-depth, semi-structured interviews provided insights into company structures, challenges, and halal purchasing strategies. Thematic analysis was employed, using an inductive pattern coding approach where codes emerged organically from the data and were categorized into themes and sub-themes. Findings revealed a variety of business types, with six individually owned companies and four family-run businesses, highlighting differences in employee numbers, business longevity, and owner demographics. The study also suggests a trend of generational succession in family-owned businesses. This research demonstrates the utility of CAQDAS in managing and analyzing complex qualitative data in case study research.

Keywords: *Qualitative, CAQDAS, Inductive approach, Thematical Analysis*

1. Introduction and Background

In Malaysia's food industry, particularly among micro and small enterprises (MSEs), halal purchasing practices are becoming increasingly crucial due to the nation's Muslim-majority population and its position as a global hub for halal certification (Md Husin & Haron, 2020). When choosing suppliers, MSEs prioritize those with JAKIM-recognized halal certification, ensuring that raw materials and ingredients comply with strict halal standards. Many MSEs favor local suppliers over imported ones, as local suppliers are more likely to be JAKIM-certified and familiar with the country's halal regulations. For imported ingredients, MSEs ensure that they are certified by bodies recognized by JAKIM (Paik et al., 2009) Additionally, an increasing number of MSEs are seeking official halal certification themselves. This requires not only purchasing halal-certified inputs but also implementing halal standards throughout their operations, from food handling to storage. However, smaller businesses, particularly micro-enterprises, often face challenges related to the cost and perceived complexity of obtaining halal certification, which can hinder their ability to fully comply with halal purchasing requirements.

MSEs are becoming more aware of the importance of traceability in halal ingredients, ensuring they maintain proper documentation of the halal status of all purchased products so that their final products can be certified and trusted by consumers. To improve transparency and simplify audits by halal certification bodies, some MSEs are adopting digital tools to manage halal documentation (Tieman & Ghazali, 2013). These enterprises also collaborate closely with JAKIM for guidance on halal purchasing practices, benefiting from training and workshops organized by JAKIM and other industry organizations to stay updated on evolving halal standards. The higher cost of sourcing halal-certified raw materials, compared to non-certified alternatives, can be a challenge, especially for smaller enterprises with limited financial resources. Moreover, some MSEs may have limited knowledge about the complexities of halal standards, particularly in ensuring that every step of the supply chain adheres to halal principles. Despite these challenges, MSEs in Malaysia's food industry are becoming increasingly conscious of the significance of halal purchasing practices. This awareness is driven by

consumer demand, regulatory requirements, and opportunities in international markets. While obstacles like costs and certification complexities remain, support from the government and halal bodies is crucial in helping businesses transition towards full halal purchasing compliance.

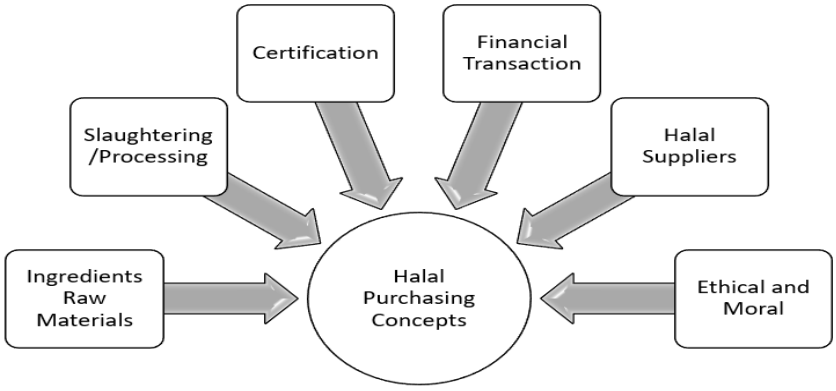
The integrity of halal purchasing practices is of paramount importance to Muslim consumers, as it ensures adherence to Shariah law from the point of production to the final consumer purchase. In an increasingly globalized food industry, maintaining halal integrity presents a complex challenge, particularly for Micro and Small Enterprises (MSEs) that may lack the resources and infrastructures of larger corporations. Halal purchasing is a critical function in meeting the demand of the halal food industry to maintain the halal integrity of halal products. The initial understanding fails to comprehend why most MSE entrepreneurs were traditionally running their businesses and had the perception that they did not need to obtain halal certification (Tieman & Ghazali, 2013). This study seeks to explore the strategies for optimizing halal purchasing performance of MSEs in Malaysia's food industry, on how these businesses navigate the requirements of halal compliance in their operational practices.

2. Literature Review

Halal purchasing is an innovative fusion of two distinct academic fields: halal principles and purchasing management. This chapter offers a comprehensive exploration of both areas, laying the foundation for a proposed conceptual framework that integrates these disciplines to enhance understanding of halal requirements for Micro and Small Enterprises (MSEs). It begins by delving into essential aspects of purchasing, including foundational concepts, theoretical models, and strategic approaches. Following this, it discusses the nuances of purchasing strategies within the context of halal compliance, covering key topics such as halal certification, regulatory frameworks, market dynamics, and the various challenges and barriers faced by businesses.

The stage concludes by examining emerging trends and potential opportunities in the field. Additionally, it presents a conceptual framework aimed at optimizing halal purchasing processes for MSEs, emphasizing the importance of aligning purchasing strategies with Islamic principles. In the supply chain process, purchasing management plays a crucial role, particularly in fostering robust buyer-supplier partnerships. The organization in purchasing function is wide and involves all activities of the purchasing process, services or work supplied and the administration actions as Figure 1 halal purchasing concepts below.

Figure 1: Halal Purchasing Concepts



The complexity of sourcing products in today's global market is increasingly influenced by the need to meet halal requirements. As the concept of halal expands into various aspects of purchasing, there is a need for more effective integration of halal principles into purchasing strategies. This includes the development of halal policies, procurement strategies, and purchasing processes, as suggested by Tieman (2020c). According to Porter (1985), within a firm's halal value chain, purchasing serves as a vital supporting activity, contributing significantly to the overall halal compliance of the business (Mulders, 2020). To ensure compliance with halal purchasing standards, all products and services must adhere strictly to halal certification requirements. This

involves a comprehensive process that includes the application, enforcement, and continuous monitoring of halal standards, which is essential for maintaining a sustainable supplier base.

Suppliers must be rigorously vetted to ensure they comply with halal standards, often through contract agreements and regular audits. Additionally, companies must stay abreast of market developments related to halal purchasing by actively monitoring supply risks and obtaining intelligence on the halal market landscape. The development of a halal purchasing process extends beyond the traditional scope of the purchasing department or buyer-supplier relationship. Halal purchasing involves acquiring goods and services that conform to Islamic principles and laws, which are not limited to food items but also encompass various other facets of business and daily life. For instance, when purchasing ingredients, it is crucial to ensure that all components are permissible under Islamic dietary laws. This means avoiding prohibited items such as pork and its derivatives, alcohol, and meats not slaughtered according to Islamic guidelines. Furthermore, the processing and manufacturing stages must comply with Islamic regulations, which may include assessing production facilities for adherence to hygiene standards and ethical practices.

Many products carry halal certification from recognized authorities, such as the Department of Islamic Development Malaysia (JAKIM), providing consumers and businesses with a guarantee that the products meet stringent halal standards. Halal purchasing also encompasses ethical and moral considerations, extending beyond dietary laws to include fair trade practices, ethical treatment of workers, and environmental sustainability. In financial transactions, halal purchasing ensures compliance with Islamic finance principles. This includes avoiding interest-based transactions (riba) and adhering to principles such as risk-sharing and asset backing. These financial guidelines are fundamental to maintaining the integrity of halal purchasing, as they align with the ethical and moral tenets of Islamic law. Thus, the concept of halal purchasing is comprehensive, covering not only the procurement of goods and services but also ensuring that all aspects of the transaction and supply chain are by Islamic values.

3. Research Methodology

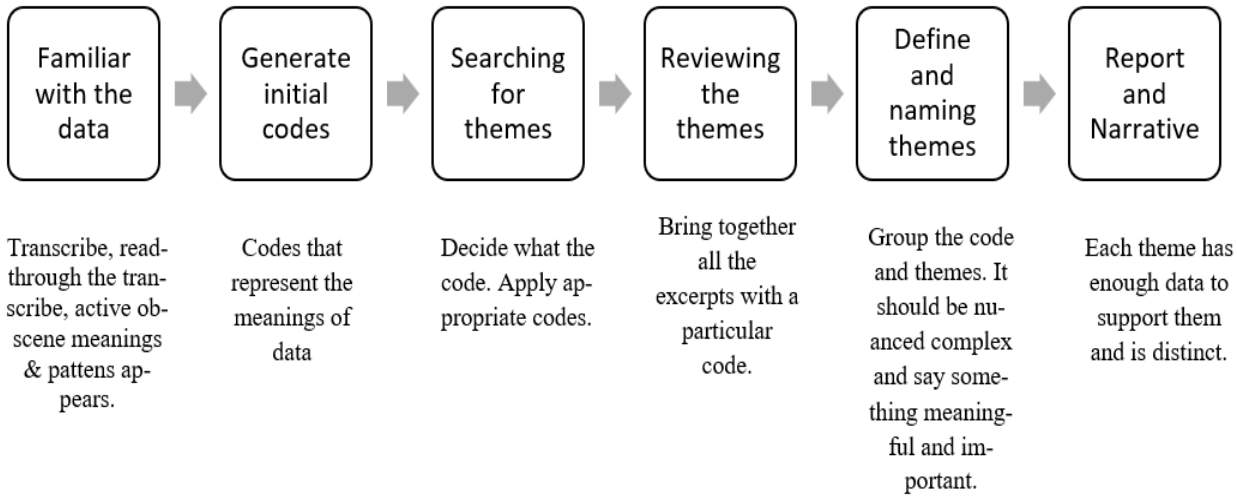
The study will employ a qualitative case study approach, utilizing in-depth, semi-structured interviews with key stakeholders, including brand owners, company directors, halal executives, and CEOs. The use of CAQDAS, specifically NVivo 14, will facilitate the coding and analysis of qualitative data. An inductive pattern coding approach will be adopted, allowing codes to emerge organically from the data, which will then be categorized into themes and sub-themes. This exploratory study adopts a multiple case study approach, focusing on 10 MSEs within the food industry. These businesses were selected to represent a range of ownership structures, including individual ownership and family businesses, to provide a comprehensive understanding of the different approaches to halal purchasing. Data was collected through in-depth, semi-structured interviews with key stakeholders in each business, including brand owners, company directors, halal executives, and CEOs. These interviews were designed to elicit detailed information about each company's structure, their approach to halal purchasing, and the challenges they encounter in ensuring compliance. The sample will include six individual-owned businesses and four family-owned enterprises, with varying years of operation and employee counts. This demographic diversity will provide a comprehensive understanding of halal purchasing strategies and the succession trends in family businesses. Employing a qualitative focus group interview was deemed most suitable for exploring a phenomenon within its natural real-life context (Burchett, 2014). This method was significant in demonstrating how and why employing qualitative inquiry was beneficial for unpacking complex phenomena (Abdul Kadir et al., 2018).

The qualitative research method allowed the researcher to probe deeper into understanding the problem rather than examining the external structures of the subject matter (Golden, 2017). Given the multifaceted nature of qualitative research, especially in the context of multiple case studies, this paper also aims to demonstrate the potential of Computer-Assisted Qualitative Data Analysis Software (CAQDAS), specifically Nvivo 14, in facilitating and enhancing the qualitative evaluation process. The software's ability to manage, analyze, and visualize large amounts of qualitative data makes it a valuable tool for researchers dealing with complex datasets. Halal purchasing is essential for Muslim consumers, as it guarantees compliance with Islamic law. MSEs play a vital role in the food sector, yet their halal purchasing strategies remain underexplored. This research seeks to fill this gap by examining the current practices of 10 MSEs, focusing on their organizational

structures and challenges in maintaining halal integrity. The researcher conducted qualitative research throughout Malaysia to identify micro, and small, enterprises (MSEs) food industry. The first location for the research was in Bagan Serai, Perak, followed by Melaka and Sungai Petani, Kedah in January 2023. The methods included data recording, telephone calls, and emails. The research resumed from November to December 2023, and this time data collection was carried out physically by visiting the entrepreneurs' premises. The focus areas were the East Coast regions of Kelantan and Terengganu. In total, 10 (ten) companies participated in answering the research questions through in-depth interviews. Halal certification is a crucial component for businesses targeting Muslim consumers, as it reflects a commitment to ethical and religious standards. MSEs in the food industry are particularly vulnerable to challenges related to halal certification due to their limited resources. Understanding their halal purchasing strategies is essential for identifying areas where support and guidance are needed to ensure compliance.

A data analysis process that involves delving through a data set and identifying patterns. Systematically coding, deriving themes, and creating a narrative. The researcher employed a thematic approach to qualitative data analysis, following the methodology advocated by (Mattimoe et al., 2021). The thematic analysis involves systematically identifying, examining, and interpreting patterns and themes present within the dataset. These themes encapsulate significant elements of the data pertinent to the research question, revealing discernible patterns or meanings inherent within the dataset. The qualitative analysis adhered to the structured six-phase thematic data analysis process outlined by Braun & Clarke (2006), as follows:

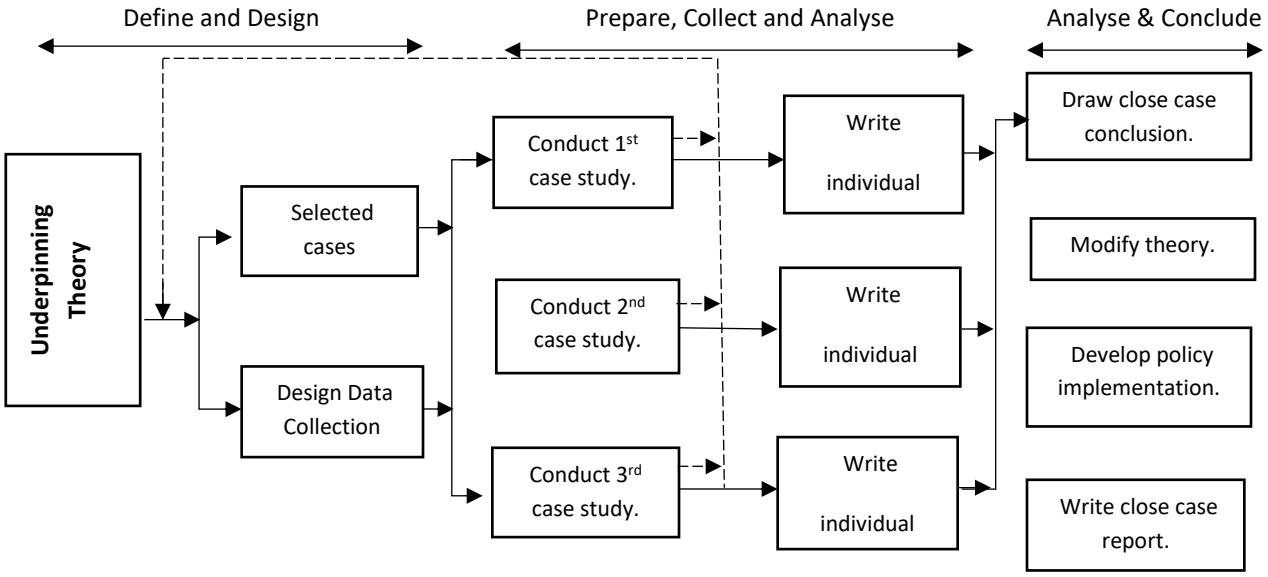
Figure 2: Thematic Analysis



Research Design

Qualitative research is an approach used to explore and understand the meanings people attribute to their experiences, the processes involved in their social interactions, and the contextual factors influencing these experiences. Unlike quantitative research, which seeks to quantify variables and relationships, qualitative research aims for a deeper understanding of the phenomena studied. A well-structured research design is essential to ensure that the study produces credible and meaningful results. For this study, the researcher will design an outline of the definition and design for underpinning theory. The provided Figure 2 involves a structured process for conducting multiple case studies, data collection, analysis, and finally conclusion.

Figure 3: Research Design



The provided framework in Figure 2 outlines a structured process for conducting multiple case studies, data collection, analysis, and conclusion. The initial phase begins with defining and designing the research, where the underpinning theory is developed to establish a solid theoretical foundation. This involves outlining the theory that will guide the study, ensuring that the research questions and objectives are grounded in this framework. The design of data collection plans the process for gathering data. This includes determining the methodology, selecting tools for data collection (e.g., interviews, observations), and establishing protocols to ensure consistent data collection across all cases. The next steps involve preparing, collecting, and analyzing data based on the selected cases.

These cases should be relevant to the research objectives and chosen according to criteria that align with the underpinning theory. In conducting the first case study, data is to have been collected according to the designed methodology, gathering detailed information specific to the first selected case. After collecting the data, an individual case report will be written, analyzing the findings and preparing a detailed report on the first case. The process will then repeat for the second case study, following the same data collection procedures. The researcher to analyze the data from the second case and prepare an individual case report. For the third case study, data collection continued in the same manner. Finally, the researcher wrote an individual case report, analyzing and documenting the findings for the third case.

Data Analysis

The qualitative data was analyzed using Nvivo 14, a CAQDAS tool known for its robust capabilities in handling complex qualitative data. An inductive pattern coding approach was employed, allowing codes to emerge organically from the data. Each code was labelled according to the research questions, and a thematic analysis was conducted to identify, examine, and interpret patterns and themes within the dataset. Thematic analysis will be employed to systematically identify, examine, and interpret patterns within the dataset. Each code in NVivo 14 will be linked to the research questions, facilitating a structured analysis process. By categorizing codes into themes, the study uncovered insights into the halal purchasing structures and strategies employed by MSEs. A multiple case study enables the researcher to explore differences within and between cases. The goal is to replicate findings across cases. Because comparisons will be drawn, the cases must be chosen carefully so that the researcher can predict similar results across cases, or predict contrasting results based on a theory (Yin, 2018). The unit of analysis, in a case study can be in the form of a person, enterprise, institution, program, responsibility or population (Merriam, 2015).

This study has approached 10 (ten) multiple case studies of micro, small, and medium enterprises (MSEs) to respond to the halal purchasing structure, with the unit of analysis mostly being the brand owner, director of the company, halal executives, and CEO. In this study, the target population employed nonprobability sampling

or purposive sampling. Purposive sampling was a non-probability sample based on the assumption that the researcher wanted to discover, understand, and gain insight into the characteristics of a population and selected a sample from which most could be learned. (Crossman, 2020). Patton, 2007 Discovered that the logic and power of purposeful sampling lay in selecting information-rich cases for study in depth (Patton, 2007). The data collection steps include the boundaries for the study, collecting information through unstructured or semi-structured observations and interviews, documents and visual materials and visual materials and establishing the protocol for recording information (Creswell & Creswell, 2018). By identifying purposefully selected sites or individuals in the study, the researcher aimed to best understand the problem and the research questions. The research took place, and the interviews were set at the MSEs factory or participant locations for the convenience and comfort of the participants.

The participants included in the research varied from the brand owner, director, CEO of the company, and the halal executive. Most of the interviews were conducted individually because the owners preferred to explain their perspectives and ideas to answer the research questions. The events where participants were observed or interviewed were also included in the meetings. To conclude the process, the evolving nature of events undertaken by the participants within the setting was considered during the interviews.

4. Analysis and Findings

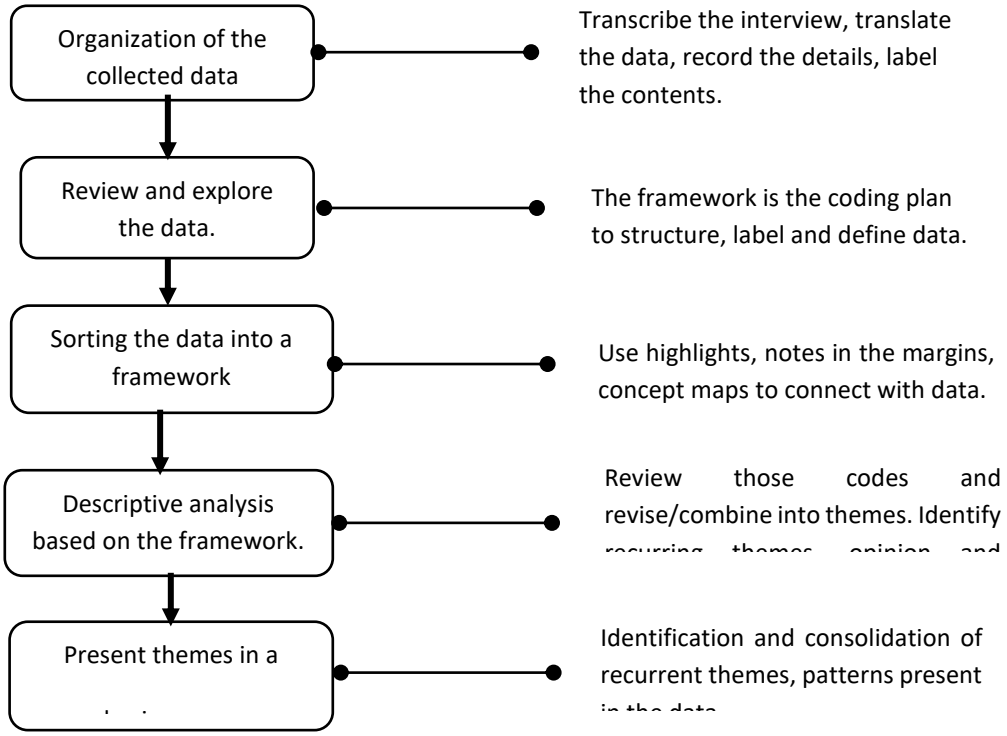
A. Analysis of Qualitative Research Data

The data analysis for qualitative data in multiple case studies followed a rigorous and systematic process aimed at thoroughly examining and interpreting the information gathered from various sources. As Merriam (2015) explains, data analysis is fundamentally about making sense of the data. In this research, the analysis involved several key steps: constructing categories, sorting data into these categories, naming the categories, and refining the categories to develop a more theoretical understanding of the data over time (Merriam, 2015). The researcher conducted ten multiple case studies, utilizing in-depth semi-structured interviews with entrepreneurs. These interviews were designed to gain a deep understanding of the organizational structures of their companies and to gradually uncover the challenges they face and the strategies they employ in the halal purchasing process, particularly in the context of Micro and Small Enterprises (MSEs).

The use of multiple case studies allowed for a comprehensive exploration of the different experiences and perspectives of the entrepreneurs, providing rich, detailed data for analysis. Before the formal data analysis could begin, a substantial amount of preparatory work was necessary to ensure the accuracy and reliability of the interview data. This preparatory phase involved the meticulous transcription of all interview recordings. Each transcription was carefully reviewed and cross-checked against the original recordings to identify and correct any inaccuracies or errors. This step was crucial for maintaining the integrity of the data and ensuring that the subsequent analysis would be based on precise and accurate information. In addition to transcriptions, the researcher also took detailed field notes immediately after each interview. These notes captured initial impressions, contextual details, and any non-verbal cues or observations that were not fully conveyed in the audio recordings. The field notes played a significant role in the data analysis process by providing additional context and helping to triangulate the data obtained from the interviews. Moreover, the field notes aided the researcher in maintaining reflexivity throughout the analysis.

Reflexivity involves the researcher's awareness of their influence on the research process and their ability to critically reflect on their own biases and assumptions. By regularly revisiting the field notes and reflecting on their positionality, the researcher was able to approach the data analysis with a more critical and nuanced perspective. During the analysis, data were sorted into meaningful categories that emerged from the data itself, rather than being imposed by the researcher. This inductive approach allowed the categories to evolve and become more abstract and theoretical as the analysis progressed, moving from specific observations to broader generalizations and theories. This iterative process of refining categories helped the researcher to develop a deeper understanding of the phenomena under study, ultimately leading to a more robust and comprehensive conceptual framework. Overall, the data analysis process for these multiple case studies was comprehensive, involving careful preparation, rigorous transcription and validation of data, and reflexive engagement with the material. This approach ensured that the findings were grounded in the data and provided a detailed understanding of the halal purchasing strategies and challenges faced by MSEs.

Figure 4: Qualitative Data Analysis Process



Every research had a different approach to data analysis, and there was no single or best way to analyze and interpret data (Taylor-Powell & Renner, 2003) It was also unique in the sense that the data analysis occurred as soon as the data was collected (Merriam, 2015). According to Taylor-Powell & Renner (2003), the focus of analysis could be done either by question or topic, period, or event, or by case, individual, or group. The researcher conducted 10 multiple case studies, and the theoretical saturated data was reached when no new information about the subject emerged from repeated cases. The researcher analyzed each set of data before proceeding to interview the next participant. Data saturation was critical here to determine when adding new participants stopped yielding new or novel insights (Fusch & Ness, 2015).

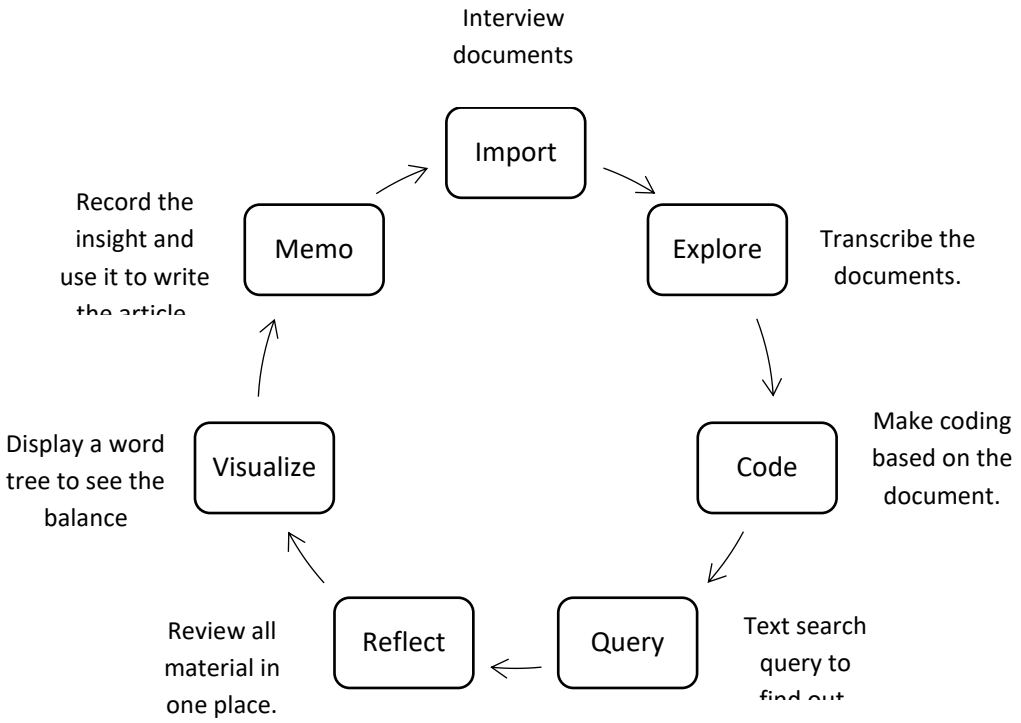
B. Qualitative Data Analysis using CAQDAS

According to Mason (2002), qualitative research is not just about analyzing words; it is fundamentally about understanding a practice that is socially constructed (Mattimoe et al., 2021). This approach requires researchers to embrace subjectivity to interpret data effectively. Unlike quantitative research, which often focuses on numerical data, qualitative research involves a deeper engagement with the data to uncover meanings and insights that are contextually grounded. This approach is inherently labour-intensive due to the large volume of data collected and the substantial effort needed to develop themes and patterns from the data. Given the extensive work involved in manual qualitative analysis, researchers have increasingly turned to Computer Assisted Qualitative Data Analysis Software (CAQDAS) as an alternative. CAQDAS tools, such as NVivo, provide powerful capabilities for importing, organizing, and analyzing diverse data sources, including audio recordings, video files, emails, images, spreadsheets, online surveys, social media content, and web content (Baxter & Jack, 2015). In this paper, the researcher utilized NVivo 14 to facilitate the qualitative data analysis process. The use of NVivo 14 allowed the researcher to efficiently manage the data collected during the study. During the interviews, most respondents provided comprehensive answers to the questions posed. They shared their perspectives on various issues, such as the structure of their business initiation, challenges in sourcing suppliers for goods, and strategies their companies employ to optimize the use of materials from suppliers.

However, because the interviews were conducted with open-ended questions, the responses were often unstructured and varied greatly. Respondents did not always answer linearly, making it challenging to categorize their responses according to the specific questions. This complexity highlighted the benefits of using an inductive approach to coding, where patterns and themes naturally emerge from the data, akin to painting on a blank canvas. In an inductive coding process, researchers do not begin with preconceived categories; instead, they allow the data to guide the creation of codes and themes. This approach can be particularly time-consuming if done manually, as it requires careful reading and re-reading of the data to identify meaningful patterns and insights. By using NVivo 14, the researcher was able to streamline this process significantly. The software was used to import audio recordings from the interviews, which were then transcribed into text format. NVivo 14 facilitated detailed transcription by allowing the researcher to organize each interview according to the respondent. Once transcriptions were completed, the researcher classified and coded each piece of data, aligning each code with the relevant research question. The software's ability to label and categorize data efficiently helped in systematically developing themes and sub-themes from the coded material.

NVivo 14 provided a structured and systematic approach to coding, creating a clear audit trail that is essential for qualitative data analysis. This audit trail helps in maintaining transparency and rigor in the research process by documenting every step taken during data analysis (Fusch & Ness, 2015).Furthermore, NVivo's organizational capabilities allow researchers to manage large volumes of qualitative data effectively, facilitating a multi-layered analysis that can reveal deeper insights. The use of NVivo also enabled the researcher to develop valuable skills in qualitative data management and analysis. These skills are highly beneficial for future research projects, as they allow for a more nuanced and sophisticated analysis of complex qualitative data sets. Overall, NVivo 14 proved to be an invaluable tool in managing the complexity associated with qualitative data analysis, offering a systematic approach that enhances both the efficiency and depth of the research process.

Figure 5: Qualitative Data Analysis using CAQDAS NVivo 14



CAQDAS (Computer-Assisted Qualitative Data Analysis Software)

CAQDAS (Computer-Assisted Qualitative Data Analysis Software) offers significant advantages over manual coding methods, particularly in terms of efficiency and accuracy, especially when dealing with large and complex datasets. Regarding efficiency, key aspects of CAQDAS include speed and organization. The software

allows for quick coding through features such as drag-and-drop functionality and efficient data retrieval. This stands in stark contrast to manual coding, which can be time-consuming and cumbersome, particularly as data volume increases. Manual methods often involve physically sorting through documents, which can lead to disorganization and inefficiency. Data management is another crucial advantage of CAQDAS. These tools are specifically designed to handle large datasets, enabling researchers to easily organize, categorize, and retrieve coded segments. In contrast, manual coding can become unmanageable, risking data coherence and increasing clerical workload. Collaboration is also a significant benefit of CAQDAS. Many of these tools support remote collaboration, allowing multiple researchers to work simultaneously on the same project.

This is a considerable improvement over manual methods, which typically require physical presence and can create logistical challenges in sharing and organizing data. In terms of accuracy, CAQDAS offers substantial benefits as well. Enhanced coding capabilities allow for the application of multiple codes to a single text excerpt and the creation of subcodes. This flexibility enhances the granularity of analysis, a level of detail that is more challenging to achieve manually. CAQDAS also provides robust search and query functions, enabling researchers to quickly find and analyze patterns across multiple documents. This feature improves the accuracy of thematic analysis by helping researchers identify relationships and co-occurrences within the data that might be overlooked with manual coding. Finally, the systematic approach of CAQDAS enhances the audibility and rigor of qualitative research, making it easier to track coding decisions and maintain consistency. This contrasts with manual methods, where tracking changes and ensuring consistency can be labor-intensive and prone to human error. While manual coding may offer a tactile connection to the data and can be sufficient for smaller datasets, CAQDAS significantly enhances both the efficiency and accuracy of qualitative data analysis.

The ability to manage large volumes of data, collaborate effectively, and utilize advanced coding and search capabilities makes CAQDAS an invaluable tool for qualitative researchers. However, researchers should also be aware of the potential learning curve and costs associated with these software tools. In this part of the research, the qualitative data focuses on data reduction. Using NVivo 14, significant information that addresses the research question is extracted from the data provided by the informants. The process begins with coding, where labels are assigned to the important information identified in the data. After developing a large number of codes, these need to be categorized to develop themes or sort the data accordingly. In qualitative analysis, two common approaches are thematic analysis and content analysis. The thematic analysis involves generating themes based on the data. For this research, the findings are divided into thematic descriptions, themes, sub-themes, codes, and initial verbatim quotes.

Preliminary Findings

The initial analysis revealed several key themes related to halal purchasing strategies and challenges. The businesses studied displayed a variety of approaches, reflecting differences in company size, ownership structure, and years of operation. Notably, a distinction was observed between the strategies of founder-owned companies and family businesses, with the latter showing signs of a succession trend aimed at maintaining the business's heritage. The thematic analysis also highlighted common challenges, including the complexity of ensuring halal compliance across all stages of the supply chain, the financial burden of certification, and the need for more accessible guidance and support from regulatory bodies. This exploratory study aims to provide valuable insights into the halal purchasing strategies of MSEs, highlighting the challenges faced and the organizational structures in place. The findings will contribute to the understanding of halal integrity in the food industry and may inform future practices and policies for MSEs. The researcher has approached respondents from several background business types in the food industry. Based on the 10 companies approached by the researcher, six of them are owned by founders, while the remaining four were founded as family businesses. The business age of the companies owned by founders' ranges from one year to 20 years, whereas for family businesses, the duration is much longer, spanning from 25 to 47 years. The number of employees in companies owned by founders' ranges from 2 to 7 workers, while for family businesses, it varies from 6 to 15 workers. There is a notable age difference among the business owners: founders' ages range from 28 to 50 years old, while family business owners or legacy enterprises are typically between 34 and 40 years old. This indicates that family business owners are succeeding their elders to continue the business heritage.

Table 1: Theme Development

Themes Category	Themes	Codes
The Strategies in Optimising Halal Purchasing of MSEs	Market Dynamic	Price strategies
		Market segmentation
		Distribution strategy
		Market strategy - vendor placement
		Market strategy - personal engagement
	Customer Diversity	Customer satisfaction
		Customer loyalty
		Customer convenience
	Operational efficiency	Bulk purchase strategy
		Storage consideration
		Impact of external factors on pricing
		Automation for cost efficiency
	Business Strategy and Development	Marketing strategy
		Long term focus on automation
		supplier relationship and dependability
		Expansion and export goals
		Ethical business practices
		Flexible payment and collaboration
		global branding and marketing reach
		Cultural identity

Table 1 outlines a comprehensive set of strategies used by micro and small enterprises (MSEs) to optimize halal purchasing, categorized into four key themes: market dynamic, customer diversity, operational efficiency, and business strategy and development. In the market dynamic category, strategies include price adjustments, market segmentation, distribution strategies, and vendor placement, with a focus on personal engagement to build trust and ensure halal compliance. Customer diversity highlights efforts to maintain customer satisfaction, loyalty, and convenience by offering accessible, high-quality halal products. Operational efficiency emphasizes bulk purchasing, proper storage, pricing adjustments based on external factors, and automation for cost reduction, all while preserving halal integrity. In the business strategy and development category, strategies focus on long-term goals such as marketing, supplier relationships, expansion, and export goals, underpinned by ethical business practices. Businesses also promote flexible payment options, global branding, and cultural identity to foster trust and meet the specific needs of Muslim consumers. These strategies collectively enhance the halal purchasing processes of MSEs while ensuring compliance with Islamic ethical standards and market demands.

5. Conclusion

This study makes a significant contribution to the existing body of knowledge by providing a detailed examination of halal purchasing strategies employed by Micro and Small Enterprises (MSEs) in the food industry. This area has been relatively underexplored in academic literature, and this research addresses this gap by highlighting the unique challenges and approaches that MSEs face in adhering to halal standards. Through its focus on halal purchasing, the study provides insights into how these enterprises navigate the complexities of halal compliance, which is essential for accessing and competing in markets where halal certification is a critical requirement. Moreover, the study illustrates the effectiveness of Computer Assisted Qualitative Data Analysis Software (CAQDAS), specifically NVivo, in managing and analyzing data from multiple case studies. Qualitative research often involves the collection of large, complex datasets, which can be difficult to manage and analyze manually. By employing CAQDAS, the study demonstrates how such tools can streamline the process, allowing for more efficient data organization, coding, and thematic analysis. This not only enhances the accuracy and reliability of the findings but also allows researchers to delve deeper into the data to uncover nuanced insights. The findings from this study have important practical implications for

policymakers and industry stakeholders. For policymakers, the study highlights the need to provide more targeted support and resources to assist MSEs in the halal food sector.

This could include offering training programs, developing clearer guidelines for halal certification processes, and providing financial or logistical support to help MSEs meet halal standards. For industry stakeholders, understanding the strategies and challenges faced by MSEs can lead to better collaboration and support systems, ensuring that smaller enterprises are not disadvantaged in markets where halal certification is increasingly important. Additionally, the study emphasizes the value of using advanced qualitative data analysis tools to enhance the rigor and depth of qualitative research. Traditional qualitative analysis can be time-consuming and prone to human error, especially when dealing with extensive datasets. By leveraging software like NVivo, researchers can ensure a more systematic and comprehensive analysis process. This not only improves the quality and validity of the research findings but also allows for more complex and layered interpretations of the data. The study, therefore, advocates for the broader adoption of CAQDAS in qualitative research to improve analytical precision and contribute to the field's methodological advancement.

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Financial Impact on Aviation Industry Before and During Covid-19: Passenger Demand as Moderator

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Abstract: This study analyses the impact of the pandemic on the financial performance of airlines, with a specific focus on financial ratios. The travel limitations imposed as a result of the pandemic, coupled with a significant decline in passenger demand, resulted in significant financial losses. This study investigates how passenger demand moderates the relationship between financial ratios and the performance of the aviation industry. This study gathered data from 20 premier Asian airline companies, as acknowledged by Skytrax. The data was collected from 2016 to 2022, with the timeframe from 2016 to 2019 designated as the 'pre-Covid19' period, and the timeframe from 2020 to 2022 designated as the 'during Covid19' period. The study uses static panel data analysis to accomplish its objective by integrating cross-sectional and time series analysis. Based on this analysis, it was determined that the company's financial condition had a substantial impact on its performance and operating worth before the COVID-19 outbreak. This influence was observed across all variables, except TATO (Total Assets Turnover). However, the company's financial condition does not affect its performance during the COVID-19 outbreak. This is due to the implementation of government initiatives and bailouts offered some respite, while also underscoring pre-existing structural weaknesses within the business. The results emphasize the crucial requirement for airlines to implement adaptable financial strategies and strong risk management techniques to successfully navigate future disruptions. Hence, the aviation sector should embrace a comprehensive strategy centered on minimizing expenses, expanding income sources, and implementing digitalization.

Keywords: *Aviation Industry, financial performance, passenger demand, ratios, COVID-19*

1. Introduction and Background

In 2008, a global financial crisis occurred, leading to a widespread economic recession in most countries. It required several years for companies to recuperate and restore their stability. However, the most intense outbreak occurred in December 2019 when the Coronavirus Disease (COVID-19) was identified in Wuhan, China. By the end of January 2020, COVID-19 was formally designated as a global public health emergency. On March 11, 2020, it was officially designated as a pandemic (Cucinotta & Vanelli, 2020). Although the long-term effects of COVID-19 are still undetermined, the crisis had a significant and widespread influence on a global scale in 2020 and 2021. This resulted in another global financial crisis that profoundly harmed individuals and businesses in both the public and private sectors.

The epidemic caused significant financial devastation throughout the whole aircraft value chain, particularly impacting the aviation industry. Bouwer et al. (2022) found that in 2020, all subsectors, except for goods forwarders and cargo airplanes, suffered significant financial losses as a result of a decline in demand for air cargo. Even industries and airports, which are typically considered dependable providers of economic value, were not spared from the economic repercussions of the pandemic. The COVID-19 epidemic has caused substantial financial losses for the airline industry, despite initial expectations of smooth performance. In 2020, the aviation industry had a significant decline in revenues by 55% or US$314 billion (IATA, 2020). This financial setback will have a lasting impact on the aviation business, as it continues to grapple with ongoing health concerns (Bouwer et al., 2022). Air Asia Group Berhad, a prominent long-haul low-cost airline, has been categorized by Bursa Malaysia Securities as a 'Practice Note 17' (PN17) firm, signaling a deteriorating financial condition (Alrawi, 2020). Air Asia, a key player in the private aviation market, has been categorized as PN17 as a result of financial difficulties stemming from the repercussions of COVID-19. This airline is so vast that it cannot be overlooked. These adjustments have significantly altered the core characteristics and viewpoints of the industry, reshaped the sector, and posed significant challenges to the airline industry.

To minimize the spread of COVID-19, governments around the world enforced lockdown measures that included restrictions on movement, isolation from social interactions, obligatory quarantines, shutdown of airports, and prohibitions on travel (Thiagararan, 2021). These policies have a significant impact on the aviation industry in Asia. The COVID-19 epidemic and the measures used to mitigate its spread have substantially reduced the need for passenger air travel, hence jeopardizing the financial viability of numerous businesses in the air transport sector and the broader aviation industry (OECD, 2020). The sharp decline in the demand for passenger travel (Bouwer et al., 2022) has resulted from a mix of government-enforced lockdowns and anxiety about getting and spreading the illness. As a consequence, air travel firms have experienced financial instability. Unanticipated fluctuations in transportation demand have also occurred owing to sudden choices made by passengers, which have had a substantial impact on their travel patterns due to perceived risks associated with travel. The restrictions imposed on the spread and impact of COVID-19 have had a significant impact on people's lives and the whole economy.

A decline in passenger demand could lead to the undervaluation and overinvestment in assets that an aircraft company is unable to sell to cover its expenses (Husna et al., 2022). The existence of a detrimental passenger demand has led to a forthcoming period marked by unpredictability. The ubiquitous ambiguity exerts a major impact on the whole aviation business, due to its interconnection with sectors such as tourism and trade. Moreover, the aviation sector is still vulnerable to a potential return of a pandemic, since governments may enforce further restrictions on air travel or mobility in response to outbreaks or a potential second wave of infections. Consequently, there has been a significant decrease in both passenger demand and the financial performance of airline firms, including the devaluation of their assets (Husna et al, 2022). If there is no growth in passenger demand and revenue, the aviation industry will encounter difficulties in financing assets and fulfilling obligations (Li, 2024). The emergence of the Covid-19 outbreak worsened the previously identified problem. The global aviation sector has incurred significant financial losses as a direct consequence of the epidemic, leading to lowered ratings, liquidations, and bankruptcies. Although there is a continued threat of a pandemic recurrence, the airline industry is essential and too crucial to fail, considering its substantial contribution to the economic advancement of the country.

Hence, this research especially concentrates on two key topics of emphasis. The study seeks to empirically investigate the factors that impact the financial performance of 20 airline firms that were recognized as the leading airlines in Asia by Skytrax, both before and during the COVID-19 pandemic. The evaluation of the factors is conducted by utilizing the financial ratios of the aviation industry, including liquidity, efficiency, and leverage. This study also aims to assess the moderating impact of passenger demand on the relationship between financial ratios (liquidity, efficiency, and leverage) and the performance of the aviation industry in Asia.

2. Literature Review

Aviation Industry Financial Performance: The purpose of financial performance analysis is to evaluate the performance of a company to make well-informed decisions and effectively monitor and manage its financial situation (Daryanto et al., 2020). According to Suhadak et al. (2018), financial performance is a metric that gauges a company's ability to achieve its objectives with effectiveness and efficiency. Optimizing a company's financial performance is essential to attract potential investors. According to Hayes (2022), profit and sales are often used measures to evaluate a company's financial performance. The notion of profitability has been thoroughly examined in financial literature concerning financial performance. The financial viability of a firm has a substantial influence on its capacity to sustain competitiveness. Yildirim (2018) found that profitability is a method that organizations use to improve the value of their shareholders. Alahyari (2014) argues that firms continually prioritize profitability because of its crucial importance to their entire performance. The financial condition of a firm is impacted by its profitability and its capacity to generate cash using its existing resources. Companies that exhibit high profitability ratios are considered financially prosperous, whilst those with low profitability ratios are deemed financially unsuccessful. The claim is supported by Maverick (2022) research, which argues that the profit margin ratio is the primary statistic used to assess both profitability and performance. The profitability ratios were used as dependent variables to illustrate the elements that influence profitability. The NPM (Net Profit Margin) and ROA (Return on Assets) ratios are the dependent variables in this study. Due to the significant correlation between the CR ratio and both ROA and ROE, the decision was

made to omit ROA. This study employs the NPM technique to assess the variability of profit at both the operational and income levels. Financial performance can be evaluated using different metrics, including liquidity, leverage, and solvency (Fatihudin et al., 2018). Stobierski (2020) identifies several key financial performance indicators that should be tracked, including the current ratio, quick ratio, debt-to-equity ratio, inventory turnover, total asset turnover, return on equity, return on asset, operating cash flow, and seasonality.

Underpinning Theory: Hawley's Risk Theory of Profit and Lancaster's New Theory of Demand. Hawley's Risk Theory of Profit asserts that profit signifies the social expense linked to undertaking the inherent risks of operating a firm. Hawley's theory of profit posits that a businessperson anticipates receiving remuneration for undertaking risk that is beyond the actuarial value sometimes referred to as the premium on measurable risk. Every entrepreneur strives to earn greater profits than the remuneration paid by the management in exchange for bearing the risks of the business. Hawley's 1893 research suggests that it is advisable to keep earnings beyond the threshold of actuarial risk. This is because undertaking risk can result in a multitude of problems and inefficiencies among entrepreneurs. Profit is the remuneration obtained in exchange for undertaking risks and obligations as an entrepreneur. Hawley (1893) identified several hazards in business, such as product obsolescence, price reductions, the emergence of superior alternatives, major disasters, and scarcity of essential production inputs. Hawley argues that only those persons who take on the duty of dealing with dangers will be able to obtain rewards, particularly in the form of financial gain.

Liquidity: Liquidity refers to a company's ability to convert its assets into cash to fulfill its financial responsibilities and make payments. The current ratio and the quick ratio are often used metrics for evaluating accounting liquidity (Vieira, 2010). Insufficient liquidity levels might result in higher financial expenses and the inability to fulfill one's obligations. Considering that liquidity risk plays a substantial role in triggering financial crises, it is imperative to include it while evaluating financial performance. According to Alahyari et al. (2014), a robust liquidity position is indicative of the financial stability of a company. The current ratio is a quantitative indicator that assesses the financial robustness or vulnerability of a corporation (Manaf et al., 2020). Bankruptcy may arise for a business if it is unable to meet its immediate financial obligations using readily accessible liquid assets. Due to aviation's considerable capital demands and hefty debt levels, airline companies are highly suitable for research using this financial metric. Dirman (2020) asserts that liquidity has various effects on financial crises. This scenario may arise as a result of a company's liquidity level, which is independent of its ability to withstand a financial crisis. Therefore, the existence of liquidity can improve financial performance, as supported by the study conducted by Cheong and Huy (2021), which demonstrates that an augmentation in liquidity leads to higher profitability. High liquidity ratios suggest that the company will promptly fulfill its debt obligations, whereas low levels imply the opposite. High current ratios offer potential investors significant benefits. The increase in current assets will result in a rise in investor interest in investing. Yosya and Baraja (2019) found that the current ratio has a small positive effect on changes in earnings. Riyadi (2017) found a direct relationship between the extent of profit change and the current ratio.

However, Alifiah (2014) and Platt et al. (2008) predict that there is a negative relationship between liquidity measures (current ratio, quick ratio, working capital ratio) and financial success. According to their analysis, these procedures only assist companies in fulfilling their financial obligations. Nunes et al. (2009) conducted a study on the profitability of the service industry in Portugal and found that liquidity does not have a major influence on profitability. Asimakopoulos et al. (2009) found that inadequate management of existing assets, particularly difficulties in selling inventories or generating income from past sales, had a detrimental impact on a firm's profitability. This occurs when the company amasses an excessive amount of inventory or outstanding payments. Thus, the hypothesis is:
H1: Liquidity has a significant impact on the aviation industry's financial performance before COVID-19.

Efficiency: The corporation should leverage its assets to produce profit. Inadequate management of assets by a firm will result in increased expenditures and decreased revenue, ultimately having a detrimental effect on performance (Alahyari et al., 2014). Activity ratios are a useful tool for evaluating the effectiveness of a company's management of its assets. The financial performance of a corporation is commonly evaluated by analyzing the working capital ratio and total asset turnover. The importance of TATO in this study is in its capacity to assess the effectiveness with which an airline company manages its assets, considering the significant financial resources needed in this sector. A study conducted by Fadhlur and Haron (2017) showed

that a reduction in asset utilization results in a corresponding decrease in the cost of capital. Hence, the rise in profitability suggests that the total asset turnover significantly impacts the profitability and performance of organizations. Erawati and Chandra (2016) conducted a study and found that TATO has a substantial beneficial influence on return on assets (ROA). The TATO metric quantifies the effectiveness of converting the value of assets into sales. The study conducted by Nicoleta et al. (2019) shows that when evaluating financial performance using return on assets (ROA), the efficiency ratio is more strongly affected by total asset turnover.

Seilsepoor and Ahmadi (2017) discovered that the financial crises of a corporation are notably affected by the return on assets, return on equity, current ratio, leverage ratio, and total asset turnover ratio. Both investigations have verified that the overall asset turnover significantly impacts financial performance and profitability. Rahmah et al. (2016) provide additional evidence that the efficiency ratio, namely the total asset turnover, has a positive and significant influence on the success of the automobile sector. This industry, similar to the aviation sector, requires a significant amount of capital investment. However, several studies have presented data supporting the negative relationship between Total Assets Turnover (TATO) and business performance. Alifiah (2014) conducted a study that found a negative association between profitability ratios, notably the net profit margin (NPM) and return on assets (ROA), as markers of financial success in several product industries, including the aviation sector. Gu and Gao's 2000 research indicates that an assertive company strategy can lead to high efficiency. This strategy entails prioritizing rapid sales expansion while disregarding the significance of cost management. Nevertheless, this strategy also exposes the organization to additional vulnerabilities, which might ultimately result in a decline in the company's overall performance. Thus, the hypothesis is:
H2: Efficiency has a significant impact on the aviation industry's financial performance before COVID-19.

Leverage: Leverage is an investment technique that involves using borrowed cash, financial instruments, or borrowed resources to increase the potential return of an investment (Hayes, 2022). It is a tool that can be used to evaluate financial performance. The commonly employed metrics for evaluating a company's financial leverage and performance are the Total Debt to Total Assets ratio (DR) and the Debt-to-Equity Ratio (DER). In the airline industry, airline businesses require substantial capital investment and heavily depend on debt arrangements because of the substantial value of their physical assets. Due to the enormous worth of physical assets in the aviation sector and the widespread use of heavy long-term debt for acquiring assets and advancing technology, it is typical to maintain a high level of financial leverage (Fernando, 2020). The research carried out by Sembiring and Damanik (2020) demonstrates that both elevated and diminished debt-to-equity ratios have a substantial impact on a company's ability to attain a return on assets (ROA). Minimizing the costs associated with loans and other forms of debt below the cost of capital can increase their profitability. Therefore, it can be deduced that keeping a low debt-to-equity ratio has a significant and advantageous impact on the return on assets (ROA). The claim is supported by Kuswadi (2005) research, which demonstrates that a higher debt-to-equity ratio (DER) is linked to greater total debt and consequently results in higher profits. As a result, this has a significant impact on the increase in income and the overall profitability of the organization.

However, previous studies have shown that both leverage and profitability are negatively affected. As stated by Asimakopoulos et al. (2009), higher levels of leverage have a detrimental effect on profitability. This is because when a corporation has more debt, it is required to dedicate a greater portion of its resources towards repaying that debt. As a result, the firm has less cash available for investment. Sunaryo (2022) asserted in his research that when the return on assets is less than the cost of debt, leverage will diminish the rate of return on capital. Hence, the corporation must prioritize reducing its dependence on debt to attain profitability. Nevertheless, financial leverage has a paradoxical effect on firm profitability during periods of economic decline. The reason for this is that an economic crisis can result in liquidity issues, so impeding the firm's ability to fulfill its interest obligations. The citation "Ismail et al., 2019" refers to a publication by Ismail and colleagues in the year 2019. Thus, the hypothesis:
H3: Leverage has a significant impact on the aviation industry's financial performance before COVID-19.

Firm Size: The success of airlines is largely influenced by the size of the firm, with larger airlines often seeing advantages from economies of scale, resulting in lower costs per unit and more market influence. Major airlines can utilize their scale to get more favorable agreements for fuel, maintenance, and airport charges. Additionally, they tend to possess more broad networks, which can lead to increased revenue prospects and improved

operational effectiveness (Graham, 2014). In contrast, smaller airlines may encounter difficulties due to increased operational expenses and limited ability to negotiate, which could impact their financial stability and competitive standing (Barrett, 2004). The larger scale of a company frequently leads to greater performance indicators, such as increased profitability and enhanced service offerings (Button, 2008).

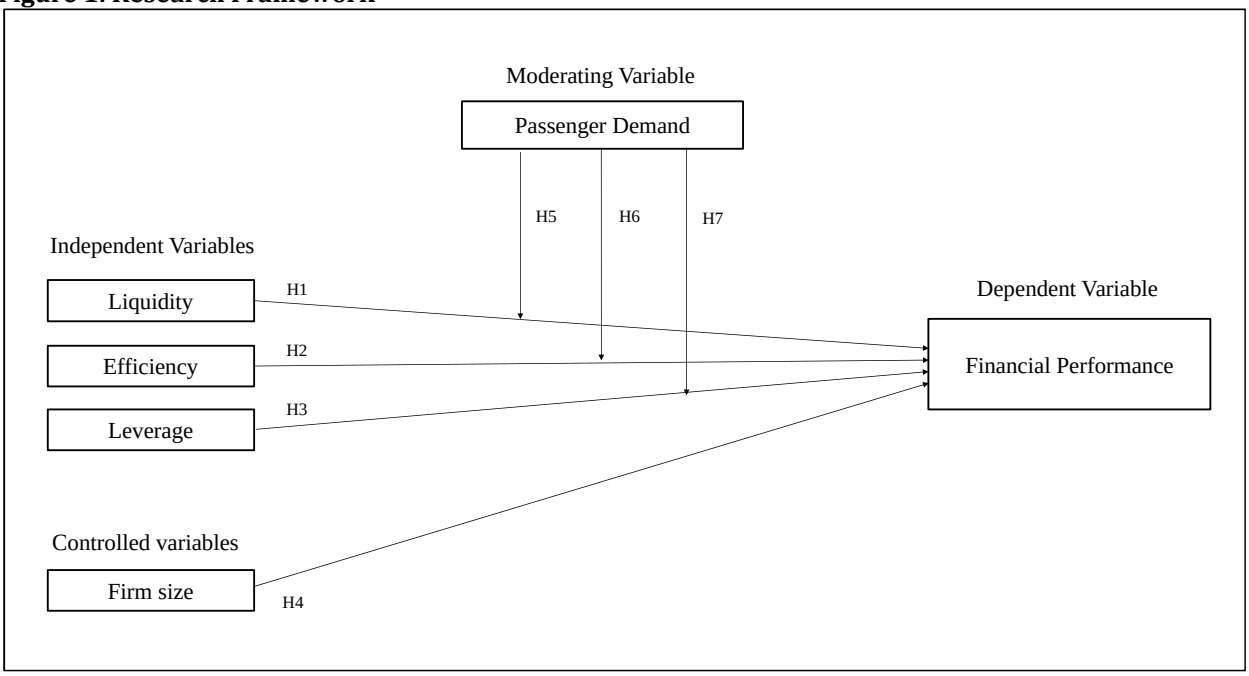
The COVID-19 pandemic had a considerable impact on airline operations, with larger carriers generally performing better than smaller ones because of their higher financial resilience and capacity to handle unexpected events. Big airlines were better equipped to use their economies of scale to lessen the financial burden of fewer passengers. They benefited from having different sources of income, bigger fleets, and more extensive networks that made it easier to transport cargo and receive government assistance (IATA, 2020). Smaller airlines, on the other hand, faced more severe challenges. They had to deal with higher costs compared to larger airlines and had restricted access to both capital and government assistance. These factors worsened their financial problems and resulted in increased rates of insolvency and withdrawal from the market (Gössling et al., 2020). Thus, the hypothesis:
H4: Firm size has a significant impact on the aviation industry's financial performance before COVID-19.

Passenger Demand as Moderator: Liquidity measures, such as the current ratio, quick ratio, and cash ratio, are crucial in evaluating an airline's capacity to fulfill its immediate financial obligations by utilizing its most readily convertible assets. These ratios emphasize the airline's financial stability and operational flexibility, which are essential for effectively handling changes in passenger demand and economic downturns (Brigham & Ehrhardt, 2016). A robust cash position enables airlines to meet their fixed expenses, overcome financial difficulties, and make strategic investments in technology and services, hence fostering long-term operational efficiency and competitive edge (Pike & Neale, 2009). The total asset turnover of airlines can be considerably influenced by passenger demand, which quantifies the efficiency with which an airline utilizes its assets to create income. As the demand from passengers rises, airlines frequently observe an increase in income, resulting in enhanced utilization of assets and a larger ratio of total assets turnover. In contrast, when there is less demand, the airline's income declines, which can lead to a decrease in the efficiency of asset utilization and a lower turnover ratio. Airlines must prioritize efficient asset management since it directly correlates with improved sales generation from assets. High asset turnover signifies greater performance, whereas low turnover shows underutilization of resources (Higgins, 2012). This situation emphasizes the significance of synchronizing operational plans with demand patterns to maximize asset efficiency and financial success.

The leverage ratio of an airline is greatly influenced by passenger demand, as it quantifies the extent to which debt is utilized to fund the company's assets. Increased passenger demand usually results in higher revenues, which can help an airline pay down its debt and perhaps lower its leverage ratio by reducing the percentage of debt to equity. On the other hand, when there is less demand for flights, the airline's financial health might be negatively affected since it may have less income. This can result in higher leverage ratios, as the company may need to rely more on borrowing money to continue operating or to increase its capacity (Brealey, Myers, & Allen, 2017). Strong passenger demand can help an airline manage its debt more effectively and reduce financial risk. Conversely, inadequate demand might worsen the issues connected to debt leverage. Thus, the hypothesis:
H5: Passenger Demand moderates the relationship between liquidity and the aviation industry's financial performance before COVID-19.
H6: Passenger Demand moderates the relationship between the efficiency and the aviation industry's financial performance before COVID-19.
H7: Passenger Demand moderates the relationship between leverage and the aviation industry's financial performance before COVID-19.

In Figure 1, the researcher concentrated on the Current Ratio (CR), Total Asset Turnover (TATO), Debt Equity ratio (DTE), and firm size which stand for internal factors that influence the 20 Best airline companies' financial performance.

Figure 1: Research Framework



3. Research Methodology

The study does a quantitative analysis by utilizing secondary data extracted from the financial accounts of specific airline firms. The selection of these companies was based on their ranks in the Asia region as per the Skytrax ranking list and award. This study aims to assess and contrast the financial performance of 20 airline companies that were honored with the esteemed Skytrax Best Airlines in Asia award in both 2019 and 2021, particularly in the context of the COVID-19 pandemic. Therefore, we analyze a thorough dataset that covers a period of seven years (2016 to 2022). The years 2016 to 2019 are designated as the 'pre-COVID-19' period, while the years 2019 to 2022 are designated as the 'during COVID-19' period. The inaugural year for each airline company is subject to variation and unreliability due to the limited availability of data. Therefore, the year 2016 is utilized as a reference point to give a limited depiction of businesses functioning in a beneficial economic setting, wherein their sales and financial achievements were steadily increasing before the epidemic (OECD, 2020). Furthermore, this study has opted to omit certain years before 2016 to uphold consistent data collecting and analyze the development of the identical sample across time. The study concluded in 2022 due to the unavailability of comprehensive data for the current year, 2023, to the researcher. Furthermore, (Salim, 2022) has officially declared that 2022 will mark the shift to the endemic phase of COVID-19. The metric used to assess moderating variables before and during the COVID-19 pandemic in this study is the passenger volume transported by airline companies throughout the specified timeframe. The study will consider firm size as a controlled variable. This study employs panel data as its secondary data source. The secondary data is acquired from an external source known as the Thomson Reuters Eikon Database. The study will employ the STATA 17.0 program to analyze all the requirements. This study utilizes the following regression models to elucidate the factors influencing profitability. The definitions and measurements of each variable utilized in this study are presented in Table 1:

Table 1: Definition and sources of variables

Variables	Description	Data source
DV: Aviation Performance (NPM)	Net Profit Margin (NPM) based on the aviation industry (Net Profit / Sales)	Thomson Reuters
Liquidity: (CR)	Current Ratio (CR) (Current assets/Current liabilities	Thomson Reuters

Efficiency (TATO)	Total Asset Turnover (TATO) (Sales/Total Asset)	Thomson Reuters
Leverage (DTE) (LRATIO)	Debt-Equity Ratio (DTE) (Total Debt/Total Equity)	Thomson Reuters
Firm Size (FS)	Log of Total Assets	Thomson Reuters
Passenger Demand (PD)	Passenger load factor (Numbers of passengers/ total seats)	Thomson Reuters

Model Specifications: Based on the explanation above, the estimation models of this study are as follows:

Model 1: $NPM = \alpha + \beta CR + \beta TATO + \beta DTE + \beta SIZE + \varepsilon t$

Model 2: $NPM = \alpha + \beta CR + \beta TATO + \beta DTE + \beta SIZE + \beta CR*PD + \beta TATO*PD + \beta DTE* PD + \varepsilon t.$

The baseline model, referred to as Model 1, analyzed the direct influence of financial performance on aviation industry performance. On the other hand, the interaction model, known as Model 2, investigated the moderating impact of passenger demand on aviation industry performance. The panel data regression approach was employed to analyze these models. Panel data offers the advantage of allowing control over unobserved time-invariant heterogeneity, which increases the degree of freedom and improves the efficacy of the estimators (Baltagi, 2008). The investigation incorporated marginal effect analysis to examine the impact of competition levels on financial stability.

4. Results

Descriptive Statistics: This section presents the results of the Descriptive Analysis, Static Panel Data, and Multicollinearity Procedure. Tables 2a and 2b display the descriptive statistics that reveal significant changes in key financial metrics before and during the COVID-19 pandemic. Net Profit Margin (NPM) experienced a sharp decline, with the mean dropping from 0.0208 before the pandemic to -0.0686 during COVID-19, reflecting a substantial reduction in profitability. This was accompanied by increased variability, as indicated by the rise in the standard deviation during the pandemic. The Current Ratio (CR), a measure of liquidity, decreased slightly from a mean of 0.8018 to 0.6684, suggesting a minor reduction in firms' ability to meet short-term liabilities. However, the relatively small change in CR implies that liquidity remained more stable compared to other financial measures. Total Asset Turnover (TATO), which measures the efficiency of firms in using assets to generate revenue, saw a marked reduction from 0.6525 to 0.3012 during the pandemic, reflecting a significant decrease in operational efficiency. The Debt-to-Equity Ratio (DTE) was only reported before the pandemic, with a mean of 4.7969, indicating that firms were more leveraged pre-crisis. The absence of DTE data during the pandemic may suggest shifts in firms' financial structures.

Additionally, firm size declined from a mean of 1.3693 before the pandemic to 1.1679, indicating a contraction in firm operations, likely driven by downsizing or reduced activity in response to economic conditions. The differences between the maximum and minimum values further highlight increased variability, particularly in NPM, where the range expanded from -0.0754 to 0.1234 before the pandemic to -0.6084 to 0.5566, showing greater extremes in firm performance. For TATO, the range narrowed, signaling that firms were less efficient overall, with fewer outliers in performance during the pandemic.

The skewness and kurtosis metrics provide additional insights into the distribution of the data. For NPM, skewness increased from 0.1388 before the pandemic to 0.6906, indicating a shift toward more firms experiencing negative profitability, while a few outliers managed to perform well. In terms of kurtosis, NPM showed a more uniform distribution during the pandemic, with fewer extreme outliers compared to before. In contrast, TATO exhibited higher kurtosis during the pandemic, suggesting more extreme values and a concentration of firms with lower operational efficiency. Overall, the increased range, skewness, and kurtosis during the pandemic suggest heightened variability in firm performance, with more firms experiencing difficulties, while a few outliers performed exceptionally well. These findings demonstrate that while profitability, efficiency, and firm size were significantly impacted, liquidity remained relatively stable during the COVID-19 crisis.

Table 2a: Descriptive statistics before COVID-19

Variable	NPM	CR	TATO	DTE	PD	FS
Mean	0.0208253	0.8017647	0.6525	4.796912	0	1.369316
Minimum	-0.0754002	0.18	0.3	1.74	0	0.974972
Maximum	0.1234113	2.39	1.38	21.85	0	1.944223
Std. dev	0.0409733	0.5457077	0.2398779	3.673027	0	0.2798854
Skewness	0.1388	0.0003	0.0001	0.0000	0	0.0773
Kurtosis	0.2729	0.2430	0.0259	0.0000	0	0.0017
Observation	68	68	68	68	68	68

Table 2b: Descriptive statistics during COVID-19

Variable	NPM	CR	TATO	DTE	PD	FS
Mean	-0.0685609	0.6684314	0.3011765	0	0	1.167886
Minimum	-0.6083964	0.05	0.05	0	0	0.6161528
Maximum	0.5565591	2.25	1.07	0	0	2.045525
Std. dev	0.1647963	0.4979051	0.1757799	0	0	0.3177718
Skewness	0.6906	0.0029	0.0000	0	0	0.0102
Kurtosis	0.0002	0.2286	0.0001	0	0	0.2294
Observation	51	51	51	51	51	51

Source: Authors' Computation using STATA 17.0.

Table 3: Mann-Whitney Rank

Variable	P-value
NPM	0.0000
CR	0.1137
TATO	0.0000
FIRM SIZE	0.0001

Source: Authors' Computation using STATA 17.0.

Mann-Whitney Rank U Test: Based on Table 3, the Mann-Whitney Rank U test differentiates between two independent groups. Net Profit Margin (NPM) experienced a marked decline, with the mean dropping from 0.0208 before the pandemic to -0.0686, indicating a substantial reduction in profitability. This decline was statistically significant, as supported by the Mann-Whitney U test value of 0.0000. Similarly, Total Asset Turnover (TATO) decreased from a mean of 0.6525 to 0.3012, reflecting a significant drop in operational efficiency during the pandemic value of 0.0000. In contrast, the Current Ratio (CR), which fell slightly from 0.8018 to 0.6684, showed no statistically significant difference value of 0.1137, suggesting that liquidity remained relatively stable. Furthermore, firm size contracted significantly, with the mean decreasing from 1.3693 to 1.1679 p-value of 0.0001, illustrating the broader impact of the pandemic on business operations. Overall, these findings demonstrate that while profitability, efficiency, and firm size were adversely affected by the pandemic, liquidity showed relative resilience.

Variance Inflation Factors: The Variance Inflation Factors (VIF) values are presented in Table 4. None of the independent factors exceed a score of 10. This indicates that there is no multicollinearity among the independent variables.

Table 4: Variance Inflation Factor of the Independent Variables

Variables	Pre-Covid19 (Without Moderator)	Pre-Covid19 (With Moderator)	During Covid19 (Without Moderator)	During Covid19 (With Moderator)
CR	1.69	2.08	1.07	1.31
TATO	1.44	1.28	1.21	1.88
DTE	1.38	1.72	1.11	1.13
Firm Size	1.03	1.61	1.25	1.24
Mean VIF	1.38	1.67	1.16	1.42

Source: Authors' Computation using STATA 17.0.

Table 5: Fixed Effect Model and Pooled Ordinary Least Squares Diagnostic Result

Variable	Pre Covid19				During Covid19			
	Model 1		Model 2		Model 1		Model 2	
	Coefficients	Prob.	Coefficients	Prob.	Coefficients	Prob.	Coefficients	Prob.
CR	.0464166	0.071***	.0467621	0.071***	.0728962	0.149	.0627215	0.283
TATO	.1173507	0.102	.1107248	0.132	.1505535	0.316	.2166242	0.240
DTE	.0003237	0.034**	.0003189	0.039**	.0005525	0.412	.0004738	0.491
Firm Size	.0014434	0.005*	.0002147	0.006*	.0003603	0.761	.0011908	0.805
Constant	.0684519	0.175	.0529704	0.377	.1802916	0.002	.174489	0.003

Note: The signs *, **, and *** indicate the result is statistically significant at the 1%, 5%, and 10% levels respectively.
Source: Authors' Computation using STATA 17.0.

Discussion

Based on the findings presented in Table 5, it can be observed that variables such as CR (current ratio), DTE (Debt to Equity ratio), and firm size have a significant influence on the net profit margin (NPM) of Asia's aviation industry. Before the COVID-19 pandemic, the analysis indicated that the Current Ratio (CR) had a noteworthy influence on the net profit margin (NPM) with p-values of 0.071. This finding suggests that the degree of liquidity had a significant impact on financial performance, with a statistical significance level of 10%. Therefore, it provides support for hypothesis H1a. These companies are utilizing their existing assets to balance off their immediate debts, resulting in a favorable effect on their financial performance. Furthermore, this suggests that aviation companies can depend on their existing assets to repay their short-term debt sustainably. Furthermore, the correlation between CR and NPM is influenced by Passenger Demand. It demonstrates that there is support for H5a. The findings are consistent with the studies conducted by Rahma (2020) and Bachwera et al. (2014), which suggest that the current ratio formula affects financial performance and may lead to financial distress if an aviation company's management fails to effectively use current assets to repay short-term debt. The results of this study validate the assertions made by Sari and Putri (2016) that liquidity has a good impact on the performance of aviation companies.

However, the Total Asset Turnover (TATO) did not have a significant impact on the net profit margin. The p-values of 0.102 and 0.132 indicate that efficiency, as measured by asset turnover, did not have a significant influence on financial performance before COVID-19, regardless of the presence or absence of a moderator. This means that the hypotheses H2a and H5a are not supported. Nevertheless, the Debt-Equity ratio (DTE) had a substantial influence on NPM, as indicated by the p-values of 0.034. This underscores the significant impact on financial performance and implies that leverage had a crucial role before the pandemic. This finding suggests that the use of leverage has a significant impact on financial performance, with a level of significance of 5%. Furthermore, this supports hypothesis H3a. The findings indicate that before the COVID-19 epidemic, aviation companies demonstrated proficiency in handling their debt and equity, highlighting the substantial impact of the Debt-to-Equity (DTE) ratio on the operational success of 20 aviation companies in Asia. The results of this study are consistent with prior studies conducted by Naufal (2020) and Syawil et al. (2020), which demonstrated a direct correlation between leverage and a decrease in financial performance and financial

difficulties. In addition, the research conducted by Almajali et al. (2012) and Abbas et al. (2013) supports the connection between leverage and financial performance. In contrast, Lindawati (2020) presents opposing findings, suggesting that leverage has a negligible effect on financial challenges and proposes a negative relationship between the Debt-to-Equity ratio and company success.

Furthermore, the correlation between DTE and NPM is influenced by Passenger Demand. It demonstrates that there is support for H7a. Before the COVID-19 outbreak, the size of the firm had a substantial influence on its financial success. The p-values of 0.005 indicate that larger firms had a higher level of financial performance compared to smaller firms. This finding suggests that the size of a firm has a significant impact on its financial success, with a 5% level of significance. Therefore, it supports hypothesis H4a.

Analysis conducted during the COVID-19 epidemic revealed that the Current Ratio (CR), Total Asset Turnover (TATO), Debt-Equity Ratio (DTE), and firm size have little impact on the net profit margin (NPM). The coefficients had p-values of 0.149 and 0.283, both of which were greater than the 5% significance threshold. These findings suggest that the financial performance during the pandemic was not significantly influenced by liquidity, efficiency, leverage, and business size. Therefore, the outcome indicates that there is no support for H1b, H2b, H3b, and H4b. In addition, Passenger Demand did not affect or influence the connections between liquidity, efficiency, or leverage and financial performance. This suggests that variations in passenger demand have little effect on the influence of these financial considerations on performance. Thus, there is no support for H5b, H6b, and H7b. Amidst the COVID-19 pandemic, airlines saw significant cash challenges because of a sharp decline in passenger demand, coupled with the burden of substantial fixed expenditures and debt commitments. Although the airline industry experienced a decrease in operational costs as a result of fewer flights, its intricate cash flow system, which involved receiving ticket sales revenue in advance but having continuing expenses such as aircraft leases and maintenance, led to a shortage of available funds. The incapacity to promptly modify these predetermined expenses in reaction to the significant decline in demand worsened financial pressure, prompting some airlines to pursue government bailouts or resort to bankruptcy despite attempts to reduce expenses and adapt to the swiftly evolving circumstances. This indicates that, despite the worldwide economic downturn, the financial performance of the aviation industry in Asia remains unimpacted by fluctuations in passenger volumes or ticket revenue.

5. Conclusion and Recommendations

This research makes significant theoretical advances to the understanding of the financial performance of aviation enterprises in the Asia area. These contributions are made in various important ways. The study confirms earlier research by verifying that the pandemic and broader economic crises have negative effects on the risk profiles and profitability of airline operations. Furthermore, it offers a comprehensive and detailed comprehension of the factors that impact the financial performance of the aviation sector, considering both regular and pandemic circumstances. This gives useful knowledge and perspectives for both academic researchers and professionals in the industry. Moreover, this study provides valuable insights that may be used to shape government policies and regulatory frameworks. This, in turn, helps to improve economic competitiveness and meet market sensitivities. The findings provide a valuable point of reference for comprehending the effects of the epidemic on the financial industry and offer valuable insights into how investors have reacted throughout this time.

It can be concluded that during the COVID-19 pandemic, the link between liquidity and debt for airlines was not affected by passenger demand. This is because the travel industry saw an unprecedented collapse, which had a disproportionate impact on revenue, fixed costs, and debt obligations. In contrast to typical situations when varying passenger demand impacts cash flow and financial stability, the pandemic resulted in significant liquidity pressure and difficulties in managing debt that were not alleviated by changes in passenger demand (Gössling et al., 2020). Airlines encountered persistent high fixed expenses and significant debt, and the unprecedented nature of the crisis rendered traditional financial measures ineffective, so nullifying the customary mitigating impact of passenger demand (IATA, 2020).

The aviation industry plays a vital role in supporting the hotel and tourism industries, trade, and the overall economy. Nevertheless, the present condition of the airline business continues to pose difficulties for investors,

governments, management, suppliers, employees, and aviation firms alike. The COVID-19 epidemic has caused a substantial decrease in consumer confidence in the aircraft industry, which has been worsened by increased concerns about health. This study found that the financial performance of airline firms is influenced by various accounting criteria, including liquidity (current ratio), leverage (debt-to-equity ratio), and firm size. Considering that numerous airlines in Asia operate in emerging economies, managers and strategists should prioritize the preservation of crucial financial ratios to bolster competitiveness on both domestic and international scales. Furthermore, it is recommended that aviation operations resume while strictly following safety measures to protect public health. Furthermore, this report proposes that regulators and governments should act to alleviate the detrimental impacts of the pandemic on the transport and travel sectors. Efficient decision-making is essential for effectively handling economic disruptions induced by such events. Before instituting strict regulations, governments and international health organizations must thoroughly assess all commercial factors. For example, a suggestion to decrease the number of available seats to an average of 62% in comparison to the levels before the pandemic could be impractical (Gole et al., 2021). Although prioritizing passenger health is crucial, excessively stringent procedures may result in airlines becoming unprofitable or being forced to raise ticket prices substantially, which could lead to customer unhappiness and reduced patronage.

Additionally, this study applies Hawley's Risk Theory of Profit and Lancaster's New Theory of Demand to explain the financial outcomes of the aviation industry during the pandemic. Hawley's theory highlights that businesses are compensated for undertaking risks, which was evident as the pandemic magnified risks such as declining passenger demand and mounting debt obligations. Lancaster's theory underscores how reduced demand further exacerbates operational inefficiencies, as reflected in the decline in Net Profit Margin (NPM) from 0.0208 pre-pandemic to -0.0686 during, and the decrease in Total Asset Turnover (TATO) from 0.6525 to 0.3012. Despite these challenges, liquidity remained relatively stable, with the Current Ratio (CR) slightly decreasing from 0.8018 to 0.6684. The study thus emphasizes the need for airlines to adopt resilient financial strategies and robust risk management practices to navigate future disruptions effectively.

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Factors Influencing Vehicle Owners' Intentions to Extend Special Perils Coverage in Motor Insurance

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Abstract: The rising frequency and severity of natural disasters have intensified the need for comprehensive motor insurance, particularly focusing on special perils coverage. This coverage plays a vital role in safeguarding vehicle owners against financial losses resulting from environmental hazards such as floods, landslides, and other catastrophic events. This study investigates the factors that influence vehicle owners' intentions to extend special perils coverage within their motor insurance policies in Klang Valley, Malaysia. A quantitative and descriptive research approach was adopted, employing convenience sampling techniques, with data analyzed using descriptive statistics through the Statistical Package for Social Sciences (SPSS) to extract valuable insights. A structured survey involving 100 vehicle owners examines the impact of knowledge, promotional efforts, and perceived benefits on their decisions to opt for extended special perils coverage. The findings highlight that these three factors - knowledge, promotion, and benefits - significantly influence the decision-making process. The study's insights are valuable for insurance companies, policymakers, and educational institutions in crafting strategies to encourage the wider adoption of special perils coverage. By increasing awareness, enhancing promotional efforts, and communicating the benefits of such coverage, stakeholders can better meet the needs of vehicle owners and boost the uptake of comprehensive motor insurance. This study underscores the importance of a multifaceted approach in promoting insurance products that offer essential protection against escalating environmental risks.

Keywords: *Motor Insurance, Special Perils, Intention, Knowledge, Promotion, Benefits.*

1. Introduction and Background

Motor insurance is a crucial component of the Malaysian insurance industry, largely due to its mandatory status under the Road Transport Act 1987. This legislation requires all vehicles on Malaysian public roads to have insurance coverage, making it essential for vehicle owners. Specifically, Section 90 of the Act mandates that driving without Third Party Bodily Injury and Death (TPBID) coverage is a criminal offense (Road Transport Act, 1987). In Malaysia, the common types of motor insurance policies include:

Act Cover: The minimal legal coverage, offering protection against third-party bodily injury or death (excluding passengers). This policy is rarely provided by insurers.
Third-Party Cover: Covers third-party bodily injury, death, and property damage caused by the insured vehicle.
Third-Party, Fire and Theft Cover: Includes coverage for loss or damage to the insured vehicle due to fire or theft, along with third-party protection.
Comprehensive Cover: Provides the broadest protection, covering third-party liability and loss or damage to the insured vehicle from fire, theft, or accidents.

Motor insurance remains the largest segment of the general insurance market in Malaysia, accounting for 45% of the total market share, followed by fire insurance at 21% (General Insurance Association of Malaysia (GIAM), 2024). The sector has experienced steady growth, with a Compound Annual Growth Rate (CAGR) of 2.6% over the past decade. In 2023, motor premiums increased by 8.5%, driven by an 11% Year-Over-Year (YoY) rise in new vehicle sales, according to the Malaysian Automotive Association (MAA) (The Star, 2024).

Motor insurance plays a vital role in protecting vehicle owners from financial risks associated with accidents, theft, and third-party liabilities. While standard policies cover common risks, they often exclude environmental hazards that can result in substantial financial losses. To address this gap, insurers have introduced specialized add-ons like the "Special Perils" cover, which extends protection to natural and man-made disasters, including floods and other natural calamities.

In 2023, the Department of Statistics Malaysia (DOSM) reported total flood-related losses of RM755.4 million, a decrease from RM1,026.5 million in 2022, representing 0.04% of the nominal Gross Domestic Product (2022: 0.06%) (Department of Statistics Malaysia (DOSM), 2024). Public assets and infrastructure suffered the most, with losses amounting to RM380.7 million (2022: RM636.8 million), followed by living quarters at RM168.3 million (2022: RM157.4 million) and the agricultural sector at RM120.6 million (2022: RM154.5 million). Business premises and vehicle-related losses reached RM53.2 million (2022: RM50.3 million) and RM22.3 million (2022: RM18.8 million) respectively, while the manufacturing sector incurred RM10.3 million in losses (2022: RM8.7 million). These figures highlight the significant financial burden on individuals whose vehicles were damaged in the floods, particularly those without special perils coverage.

Malaysia experiences annual heavy rainfall between November and February, often resulting in severe floods. The December 2021 floods, described by the Malaysian government as a "once in a century" event, affected 11 states and caused the largest insurance payout for a flood event in a decade (Honan Asia, 2022). Despite the frequent and severe nature of these floods, a large portion of Malaysians remain underinsured against flood-related damages. A survey by Zurich Malaysia in 2021 found that 59% of vehicle owners lacked adequate flood protection, either due to unawareness or a belief that they were not at risk. Moreover, only a small percentage of Malaysians are insured against other environmental hazards, such as storms (34%) and landslides (29%) (New Straits Times, 2022).

Floods pose the most significant environmental risk in Malaysia, as demonstrated by the catastrophic 2021 floods. The insurance and takaful industry paid out RM2.2 billion in flood-related claims, while the overall economic losses were estimated at RM6.1 billion. However, only 16 percent of motor comprehensive insurance policies in flood-prone areas included flood coverage (Zurich Malaysia, 2024). These statistics underscore the critical need for better preparedness against unexpected events in Malaysia, where heavy rainfall and intense monsoon seasons are common. Special perils coverage, which also protects against landslides and falling trees, is an essential but often overlooked component of motor insurance.

A report by Faber Consulting AG (2022) highlights that the demand for flood coverage in Malaysia is largely influenced by a limited willingness to pay and a low level of awareness regarding flood risks. While large public institutions and major corporations demonstrate a strong understanding of these risks, smaller entities, such as small and medium-sized enterprises (SMEs) and individual consumers, often underestimate the threat. These smaller entities tend to rely on self-insurance or expect government support in the event of a disaster. This underestimation of risk, coupled with a lack of awareness about the potential financial impact, results in heightened price sensitivity, with many perceiving flood insurance policies as disproportionately expensive relative to the perceived risk. Moreover, this price sensitivity is exacerbated by short-term thinking, as policies are often purchased only in response to a recent disaster.

Retail clients typically obtain flood insurance as part of their mortgage agreements when financing a property. However, due to intense competition in Malaysia's mortgage market, banks frequently offer loans without the added security of flood coverage. Among homeowners who no longer depend on a mortgage, flood insurance remains uncommon and is generally only purchased for lower-level structures. Similarly, flood coverage can be added to motor insurance policies but is usually selected only when the perceived flood risk is high. Many Malaysian consumers believe they can protect their vehicles during floods, leading to low overall penetration of flood insurance. The demand for this coverage is further limited by a lack of awareness and short-term decision-making, with interest often declining shortly after a major flood event.

Therefore, this study aims to (i) assess the influence of knowledge on vehicle owners' intentions to extend special perils coverage in motor insurance, (ii) explore the impact of promotional efforts on their intentions, and (iii) determine how perceived benefits affect their willingness to extend this coverage.

2. Literature Review

Intentions to Extend Special Perils Coverage: Fishbein and Ajzen (1975) first conceptualized purchase intention as a consumer's evaluation of a product or service they plan to buy in the future. Rooted in the Theory of Planned Behavior (TPB), Ajzen and Driver (1991) proposed that an individual's intention to purchase,

including health insurance, is influenced by three fundamental factors: behavioral beliefs, normative beliefs, and control beliefs. This framework has been widely adopted and extended in various contexts. For instance, Crosno et al. (2009) expanded on this concept by defining purchase intention as the likelihood that a consumer will choose a specific brand within a product category under certain purchasing conditions. Chimedtseren and Safari (2016) further supported this view, describing purchase intention as a predictive measure closely linked to actual buying behavior. Moreover, Lin and Chen (2006) emphasized that factors such as product knowledge and consumer involvement have been consistently identified in prior research as significant determinants of purchase intention.

Flooding is a persistent and severe challenge in Malaysia, particularly during the monsoon season, causing substantial damage each year. The Department of Statistics Malaysia's Special Report on the Impact of Floods in 2021 revealed that floods resulted in RM6.1 billion in losses across multiple states between late December 2021 and early January 2022 (GIAM, 2024). Additionally, recent flash floods have caused widespread property damage and financial losses nationwide, with the intensifying monsoon season expected to exacerbate the situation further.

Despite growing awareness of flood coverage, evidenced by the increase in comprehensive motor insurance uptake from 12% to 14% in the first half of 2023, there remains a critical need to improve public understanding of flood risks and the importance of protection. This need is particularly pressing due to the escalating severity of flood risks driven by climate change and shifting topography (GIAM, 2024).

Research by Ridzuan et al. (2023) indicates that the rate of flood insurance purchases in Malaysia remains significantly lower than other types of insurance, particularly motor vehicle insurance. Public awareness about flood insurance is also insufficient. A key factor contributing to the low uptake of flood insurance is the reliance on government assistance for flood relief, which has diminished the perceived necessity of individual coverage.

Knowledge: Before making a purchase, consumers typically seek information and knowledge about the product or service they are considering (Aziz et al., 2019). Product knowledge, as defined by Brucks (1985), involves an awareness of specific product-related details. This knowledge is primarily derived from direct experience with the product and advertising, both of which significantly influence consumer decisions (Rao & Monroe, 1988).

Product knowledge encompasses a consumer's awareness, understanding, and confidence regarding a product (Lin & Chen, 2006). Burton et al. (2009) emphasize the role of product knowledge in shaping consumer behavior, as it enables more informed and rational decision-making. A well-informed consumer can better assess product value and reduce the risks associated with purchasing.

In the context of takaful, knowledge has been identified as a crucial factor in the selection of takaful products (Ahmed et al., 2015). For instance, Matsawali et al. (2012) found a significant lack of awareness about takaful among individuals in Brunei, a finding echoed in other studies where insufficient knowledge was a key reason for not purchasing insurance (Oldenboom & Abratt, 2000). Yazid et al. (2012) observed that a below-average understanding of life insurance negatively impacts consumer intentions to purchase it. Moreover, an individual's purchasing ability is not solely determined by financial resources; when combined with financial literacy, these factors shape attitudes toward life insurance, which in turn influence purchase intentions (Nomi & Sabbir, 2020).

Marimuthu Nadason, President of the Federation of Malaysian Consumers Associations (FOMCA), highlighted that many Malaysians remain unaware of the availability of special perils coverage offered by their insurance providers. This lack of awareness is largely attributed to the failure of insurance companies to adequately inform customers about these options during the purchasing process. Nadason also pointed out that Malaysians often underestimate the growing threat of natural disasters, such as floods, which are increasingly affecting the nation (The Rakyat Post, 2021).

According to the General Insurance Association of Malaysia (GIAM) (2024), while awareness of flood coverage has seen improvement - as reflected in the increase in comprehensive motor insurance uptake from 12% to

14% in the first half of 2023 - there remains a pressing need to further elevate awareness of flood risks and the importance of adequate protection. This need is especially urgent given the escalating severity of flood risks due to climate change and shifting topography. Building on the existing literature, this study proposes the following hypothesis:
H1: Knowledge significantly impacts vehicle owners' intentions to extend special perils coverage in motor insurance.

Promotion: Promotion traditionally includes a range of activities such as sales promotion, advertising, personal selling, public relations, and direct marketing (Borden, 1984). Duncan (2005) further elaborated that promotion is a fundamental aspect of the market exchange process, wherein firms communicate product messages and brand identity to current and potential stakeholders, as well as the broader public, through an integrated set of marketing communication tools.

Research has consistently shown that promotional efforts, including advertising, personal selling, sales promotions, and publicity, play a significant role in shaping consumer perceptions, behaviors, emotions, and experiences toward a product (Munusamy & Wong, 2008). Among seven key marketing activities, promotional activities were identified as the second most influential factor affecting customers' policy purchasing behavior (Dash, 2012).

A study by Abu Seman and Segar (2023) demonstrated the positive impact of search engine marketing and social media marketing on consumer purchasing decisions, suggesting that businesses should prioritize these digital marketing strategies as part of their overall marketing approach. Similarly, research by Mohd Rasid et al. (2023) found that promotional advertisements significantly influence students' food expenditure habits, shaping their choices, perceptions, and budget allocation. Guan et al. (2020) also underscored the importance of life insurance marketers understanding the critical role of customer attitudes in purchasing decisions and advocating for marketing strategies that effectively influence these attitudes.

Moreover, the Federation of Malaysian Consumers Associations (FOMCA) has criticized insurance companies for failing to inform vehicle buyers about natural disaster (flood) coverage before policy purchase. FOMCA has announced plans to formally request that Bank Negara and the government mandate insurance companies to actively promote natural disaster insurance coverage to the public (The Rakyat Post, 2021). Based on these findings, this study proposes the following hypothesis:
H2: Promotion significantly impacts vehicle owners' intentions to extend special perils coverage in motor insurance.

Benefits: Adnan (2014) established a positive and significant relationship between the perceived benefits of a product and the likelihood of its purchase, underscoring that perceived benefits are a crucial determinant of purchase intentions. Yang et al. (2020) further elaborated that perceived benefits represent consumers' beliefs about the advantages or rewards they expect from a transaction. In the context of life insurance, perceived benefits are pivotal in shaping consumers' purchasing intentions (Mamun et al., 2021). When the benefits offered by a product fall short of consumer expectations, there is a strong likelihood that consumers will discontinue using the company's services and seek alternatives that provide greater perceived value (Nursiana, et al., 2021).

In the insurance sector, perceived financial benefits are often viewed as value motivations, encompassing aspects such as financial coverage against medical expenses and critical illnesses, cashless claim benefits, and tax advantages (Kumar, 2011). Yeow et al. (2021) also emphasized the significant influence of perceived financial benefits on purchase intention in previous studies.

Moreover, the concept of a product can be measured in multiple ways, including as a physical object with distinct characteristics or as a comprehensive set of benefits designed to meet customer needs (Indumathi & Dawood, 2016). Product quality has been consistently identified as a key factor influencing the customer decision-making process (Kavitha et al., 2012). Life insurance products, for instance, cater to diverse needs such as investment, education, or retirement planning (Kumar, 2011). The quality of these insurance products remains one of the strongest predictors of customers' purchase decisions (Harnam & Madhurima, 2011).

Based on these findings, this study proposes the following hypothesis:
H3: Benefits significantly impact vehicle owners' intentions to extend special perils coverage in motor insurance.

3. Research Methodology

This study utilized a convenience sampling technique to distribute questionnaires among vehicle owners, aiming to investigate the factors influencing their intentions to extend special perils coverage within their motor insurance policies. Convenience sampling was selected for its practical benefits, including cost-effectiveness, time efficiency, and ease of implementation, making it an appropriate choice for quickly and efficiently accessing respondents (Golzar et al., 2022). This approach enabled the study to gather relevant data in an efficient manner, which is essential for the timely analysis of consumer behavior.

The research methodology involved administering a structured survey to 100 respondents living and working in the Klang Valley region, all of whom use private vehicles for their daily commute. The survey included 20 measurement items designed to evaluate respondents' intentions to expand their special perils coverage. These items also assessed their knowledge, awareness of promotional efforts, and understanding of the benefits of such coverage. The collected data were analyzed using descriptive statistical techniques to identify the key determinants influencing vehicle owners' intentions to extend special peril coverage within their motor insurance policies.

Additionally, the study aimed to explore the relationship between these factors and the likelihood of respondents opting for enhanced insurance coverage, providing valuable insights for insurers looking to tailor their offerings to better meet consumer needs. This analysis is crucial for identifying target groups that are more likely to benefit from or require special perils coverage, thereby assisting insurers in developing more tailored and effective policy offerings.

4. Results

The purpose of this study is to investigate the factors that influence vehicle owners' intentions to extend special perils coverage in motor insurance. By understanding these demographics, the study aims to offer deeper insights into how various factors, such as gender, age, occupation, monthly income, and level of education, might impact the decision to opt for additional special perils coverage in motor insurance.

Profile of Respondents: Table 1 displays a summary of the characteristics of the total sample of the respondents who participated in the study.

Table 1: Demographic Profile

VARIABLE	FREQUENCY	PERCENTAGE
GENDER		
Males	42	42.0%
Females	58	58.0%
Total	**100**	**100%**
AGE		
20-29	65	65.0%
30-39	28	28.0%
40-49	5	5.0%
50 and above	2	2.0%
Total	**100**	**100%**
OCCUPATION		
Public sector	15	15.0%
Private sector	67	67.0%
Self-employed	18	18.0%
Total	**100**	**100%**

MONTHLY INCOME		
RM1,000 and below	2	2.0%
RM1,001 - RM2,000	3	3.0%
RM2,001 - RM3,000	51	51.0%
RM3,001 – RM4,000	20	20.0%
RM4,000 and above	24	24.0%
Total	**100**	**100%**
LEVEL OF EDUCATION		
Sijil Pelajaran Malaysia (SPM)	3	3.0%
Diploma	38	38.0%
Degree	58	58.0%
Master / PhD	1	1.0%
Total	**100**	**100%**

Table 1 presents the demographic distribution of the 100 respondents who participated in this study. Of these respondents, 58% were female, while 42% were male. In terms of age distribution, the majority of respondents (65%) were within the 20-29 years age range, with 28% falling into the 30-39 years range. A smaller percentage, 5%, were aged between 40-49 years, and just 2% were 50 years or older.

When examining employment sectors, the data reveals that 67% of the respondents were employed in the private sector, 18% were self-employed, and 15% worked in the public sector. Educational attainment among the respondents was also varied, with 58% holding a degree, 38% having a diploma, 3% possessing Sijil Pelajaran Malaysia (SPM) qualifications, and 1% having achieved a Master's or Ph.D. degree. These demographic insights provide a comprehensive overview of the sample, highlighting key characteristics that may influence the respondents' intentions to extend special perils coverage in their motor insurance policies.

Descriptive Statistics: Descriptive analysis was used in this study to provide a clear summary of the data, focusing on the characteristics of respondents and the key factors influencing their intentions to extend special perils coverage in motor insurance. The main aim was to explore and describe trends, frequencies, and patterns in the data, rather than to identify cause-and-effect relationships or make predictions. Descriptive analysis was therefore appropriate, as it helps present the raw data in a meaningful way. This method also highlights the most important variables and insights, which can guide future research and policy decisions. The results of the descriptive statistics for the factors affecting vehicle owners' intention to extend special perils coverage are shown in Tables 2, 3, 4, and 5 below.

Table 2: Mean Score and Standard Deviation for Intentions to Extend Special Perils Coverage

Item	Mean	Std Dev
I understand the importance of special perils for my financial protection.	3.28	0.998
I am likely to purchase special perils coverage when renew my motor insurance policy.	3.84	0.973
My current comprehensive motor insurance policy is more than enough to cover my vehicle	2.83	1.217
I consider discounts or promotions when deciding to purchase special perils coverage.	3.70	0.913
I am willing to spend more to add on special perils coverage for peace of mind.	3.21	0.962

Table 2 presents the overall mean and standard deviation for the five items designed to measure intentions to extend special perils coverage within motor insurance policies, which served as the dependent variable. These items were evaluated on a five-point Likert scale, with responses ranging from 1 (strongly disagree) to 5 (strongly agree). The item with the highest mean score was, "I am likely to purchase special perils coverage when renewing my motor insurance policy" (M = 3.84, SD = 0.973). This indicates a relatively strong intention among respondents to opt for this additional coverage. The second highest mean was associated with the item, "I consider discounts or promotions when deciding to purchase special perils coverage" (M = 3.70, SD = 0.913), reflecting the influence of financial incentives on purchase decisions.

The item, "I understand the importance of special perils for my financial protection," had a mean of 3.28 (SD = 0.998), suggesting moderate awareness of the benefits of such coverage. Similarly, "I am willing to spend more to add on special perils coverage for peace of mind" scored a mean of 3.21 (SD = 0.962), indicating a cautious willingness to invest in additional protection. In contrast, the item with the lowest mean score was, "My current comprehensive motor insurance policy is more than enough to cover my vehicle" (M = 2.83, SD = 1.217), suggesting that respondents generally do not believe their existing policies fully address their insurance needs.

Table 3: Mean Score and Standard Deviation for Knowledge

Item	Mean	Std. Dev.
I believe that the extension of special perils coverage is a wise decision.	3.45	0.716
I do read about special perils coverage provided by different insurance companies to increase my level of understanding.	2.99	0.823
I believe that the intention to purchase special perils coverage is influenced by the knowledge of the vehicle owners.	3.95	0.609
I do think knowledge about the scope of coverage provided impacts my intention to extend special perils coverage.	4.06	0.583
I believe that the extension of special perils coverage to my motor insurance policy is beneficial.	4.16	0.598

Table 3 presents the mean and standard deviation for five items designed to measure the knowledge construct, an independent variable in this study. These items were rated on a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The item with the highest mean score, "I believe that the extension of special perils coverage to my motor insurance policy is beneficial" (M = 4.16, SD = 0.598), indicates a strong consensus among respondents regarding the perceived value of this coverage. The second highest mean, "I think knowledge about the scope of coverage impacts my intention to extend special perils coverage" (M = 4.06, SD = 0.583), suggests that understanding the details of coverage plays a significant role in influencing purchasing decisions.

The items "I believe that the intention to purchase special perils coverage is influenced by the knowledge of vehicle owners" and "I believe that the extension of special perils coverage is a wise decision" yielded mean scores of 3.95 (SD = 0.609) and 3.45 (SD = 0.716), respectively. These findings highlight the perceived importance of knowledge in making informed decisions about motor insurance. However, the lowest mean score was observed for the item, "I read about special perils coverage provided by different insurance companies to increase my level of understanding" (M = 2.99, SD = 0.823), indicating a relatively low level of active engagement in seeking out information.

Table 4: Mean Score and Standard Deviation for Promotion

Item	Mean	Std Dev
I know which insurance company provides coverage for special perils in motor insurance.	3.07	0.640
I satisfied with the promotion on special perils coverage by the insurance company.	3.44	0.592
The insurance company frequently promotes the special perils that they provide.	3.33	0.652
The insurance company always promotes the benefits of purchasing special peril coverage.	3.36	0.647
I am aware of the advertisements on special perils coverages in motor insurance on television, media social, and billboards.	3.35	0.575

Table 4 presents the mean and standard deviation for five items measuring the promotion construct, an independent variable in this study. These items were assessed using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The item with the highest mean score was "I am satisfied with the promotion of special perils coverage by the insurance company" (M = 3.44, SD = 0.592), indicating a moderate level of satisfaction among respondents regarding promotional efforts. The second highest mean was associated with "The insurance company always promotes the benefits of purchasing special perils coverage" (M = 3.36, SD = 0.647), suggesting that respondents recognize consistent promotional efforts by insurers.

Other items, such as "I am aware of advertisements on special perils coverage in motor insurance on television, social media, and billboards" (M = 3.35, SD = 0.575) and "The insurance company frequently promotes the special perils they provide" (M = 3.33, SD = 0.652), also received moderate mean scores, indicating a fair level of awareness and perceived frequency of promotional activities. However, the lowest mean score was observed for the item "I know which insurance company provides coverage for special perils in motor insurance" (M = 3.07, SD = 0.640), suggesting that respondents may not be fully informed about specific insurers offering this coverage.

Table 5: Mean Score and Standard Deviation for Benefits

Item	Mean	Std. Dev.
I don't need to spend more to repair my vehicle if damaged by flood when I added on special perils coverage.	3.87	0.597
I believe that the intention to purchase the special perils coverage is influenced by the benefits provided by the insurance company.	2.89	0.549
The insurance company should provide wider protection when the insured purchases special perils coverage.	3.67	0.842
Purchasing special perils coverage allows me to save more money by transferring the financial risk of unexpected natural disasters to the insurance company.	3.89	0.718
I will not suffer huge financial loss if I have taken up additional insurance coverage, particularly on special perils.	3.70	0.611

Table 5 presents the mean and standard deviation for five items measuring the perceived benefits of special perils coverage, an independent variable in this study. These items were rated on a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The item with the highest mean score was "Purchasing special perils coverage allows me to save more money by transferring the financial risk of unexpected natural disasters to the insurance company" (M = 3.89, SD = 0.718). This suggests that respondents strongly value the financial protection offered by special perils coverage. The second highest mean, also at 3.89 (SD = 0.549), was for the statement, "I believe that the intention to purchase special perils coverage is influenced by the benefits provided by the insurance company," indicating that the perceived benefits play a crucial role in motivating purchase intentions.

Other items with relatively high mean scores include "I don't need to spend more to repair my vehicle if damaged by flood when I add on special perils coverage" (M = 3.87, SD = 0.597) and "I will not suffer huge financial loss if I have taken up additional insurance coverage, particularly for special perils" (M = 3.70, SD = 0.611). These responses highlight the importance of financial security as a key benefit of purchasing special perils coverage. The item with the lowest mean score was "The insurance company should provide wider protection when insured purchase special perils coverage" (M = 3.67, SD = 0.842), suggesting that while respondents recognize the value of the coverage, there is a desire for even broader protection.

5. Discussion and Recommendations

H1: Knowledge significantly impacts vehicle owners' intentions to extend special perils coverage in motor insurance.

The mean scores for the items related to knowledge, ranging from 2.99 to 4.16, along with standard deviations between 0.583 and 0.823, indicate a broad spectrum of understanding and agreement among respondents regarding special perils coverage in motor insurance. The variability in responses suggests that while a significant portion of respondents recognize the importance and benefits of this coverage, there is also a segment of the population that is less informed or less convinced about its value.

The findings reveal that knowledge plays a crucial role in shaping consumer behavior regarding the extension of special perils coverage in motor insurance policies. The high end of the mean score spectrum (4.16) suggests that a substantial number of respondents are well aware of the benefits of transferring financial risks associated with natural disasters to the insurance company. This indicates a strong awareness of the protective

role that special perils coverage can play in safeguarding their financial interests.

However, the lower mean scores, particularly around 2.99, highlight that there is still a significant portion of the population that either lacks sufficient knowledge or does not fully appreciate the value of such coverage. This gap in understanding can be attributed to several factors, including insufficient information dissemination, a lack of targeted educational initiatives by insurance companies, or a general complacency among vehicle owners who may underestimate the risks posed by natural disasters.

The variation in standard deviation values further supports this observation, indicating that while some respondents have a clear and strong understanding of the benefits, others remain uncertain or inconsistent in their views. This inconsistency suggests that promotional efforts and educational campaigns by insurance companies may not be reaching all segments of the market equally, or that they may not be sufficiently persuasive in communicating the importance of special perils coverage.

The findings of this study align with previous research on the impact of knowledge on purchase intentions. Akotey et al. (2011) demonstrated that knowledge is a key factor in driving demand for microinsurance in Ghana. Similarly, Nomi and Sabbir (2020) found that financial literacy has a significant positive effect on consumers' intentions to purchase life insurance in Bangladesh. Lajuni et al. (2020) further emphasized that both consumer knowledge and attitudes significantly influence the intention to purchase life insurance products. Collectively, these studies underscore the essential role of knowledge in shaping insurance-related purchasing behavior.

For insurance companies, these findings present a significant opportunity to enhance consumer education and targeted marketing strategies. The relatively low mean scores for satisfaction with existing comprehensive policies and the variability in knowledge suggest that many consumers may not fully realize the limitations of their current coverage and the additional protection that special perils coverage can provide.

Insurers could capitalize on this by developing more comprehensive and targeted promotional campaigns that not only highlight the financial benefits of special perils coverage but also address common misconceptions or gaps in knowledge. For example, personalized marketing that illustrates real-world scenarios where special perils coverage could save policyholders from a substantial financial loss might resonate more effectively with consumers who are currently undecided or unaware of its importance.

Moreover, insurance companies could benefit from offering incentives such as discounts or bundled packages that make the extension of special perils coverage more attractive. By aligning these promotional efforts with educational content that clarifies the risks of not having such coverage, insurers could increase both the uptake of special perils policies and overall customer satisfaction.

H2: Promotion significantly impacts vehicle owners' intentions to extend special perils coverage in motor insurance.

The mean scores for the items related to promotion, ranging from 3.07 to 3.36, with standard deviation values between 0.592 and 0.652, suggest a general but moderate level of satisfaction among respondents with the promotional efforts of insurance companies regarding special perils coverage. While these scores indicate that respondents are aware of the promotional activities, the moderate range of satisfaction also highlights that there is significant room for improvement in how these promotions are perceived and their overall effectiveness.

The findings of this study are consistent with those of Al-Rawashdeh (2016), who identified promotion and advertising as significant drivers of insurance policy demand. Similarly, Guan et al. (2020) found that elements of the marketing mix, including product, price, place, and promotion, influence customer attitudes and ultimately their purchase intentions for insurance products. In addition, Cuong (2021) revealed that promotion plays a positive role in both purchasing decisions and repurchase intentions.

The relatively modest mean scores reflect a level of consumer awareness and satisfaction that is neither

strongly positive nor negative. This suggests that while respondents are not entirely dissatisfied with the promotional efforts, they are also not fully convinced or sufficiently motivated by them. The consistency in advertising efforts is acknowledged, as indicated by the standard deviation values, but these efforts may not be as impactful as they could be.

One potential reason for this moderate level of satisfaction could be that the promotional messages currently in use may not be sufficiently compelling or may lack the clarity needed to fully convey the benefits of special perils coverage. Furthermore, the findings indicate a gap in consumer awareness regarding which specific insurance companies offer this coverage. This gap suggests that the current promotional strategies may be too generic or too focused on the benefits of the coverage itself, without adequately highlighting the providers.

For insurance companies, these findings underscore the need to refine their promotional tactics. To increase consumer satisfaction and awareness, insurers might consider focusing on clearer, more targeted messaging that not only emphasizes the advantages of special perils coverage but also specifically identifies the companies that provide it. This approach would help to differentiate insurers in a competitive market and make it easier for consumers to make informed decisions.

Additionally, insurers could benefit from adopting a more segmented promotional strategy, where messages are tailored to different consumer groups based on their specific needs and levels of awareness. For example, more detailed information about coverage options could be provided to less informed consumers, while more value-driven messaging could be targeted at those who are already somewhat aware of the coverage but need an extra incentive to purchase.

Enhancing the visibility and clarity of promotions through various channels—such as digital media, social platforms, and direct marketing—can help ensure that the message reaches a broader audience. Furthermore, interactive and educational campaigns that engage consumers and provide them with the tools to compare and choose the best coverage could significantly increase their confidence in purchasing decisions.

H3: Benefits significantly impact vehicle owners' intentions to extend special perils coverage in motor insurance.

The mean scores for the items related to the perceived benefits of special perils coverage, which range from 3.67 to 3.89, with standard deviation values between 0.549 and 0.842, highlight a strong consumer recognition of the financial advantages associated with this type of insurance. These high mean scores suggest that respondents place considerable value on the ability of special perils coverage to mitigate financial risks, particularly those arising from natural disasters that could otherwise lead to significant out-of-pocket expenses for vehicle repairs.

The data underscores that consumers recognize the intrinsic value of special perils coverage, especially in terms of financial protection. The higher end of the mean score range (3.89) indicates a strong appreciation for the role of this coverage in transferring the burden of financial risk to the insurance company. This suggests that consumers are highly motivated by the peace of mind that comes with knowing they are protected from unforeseen financial liabilities, which is a critical factor in their decision to purchase this coverage.

The relatively narrow range of standard deviation values also suggests a consensus among respondents about the perceived benefits, indicating that these positive perceptions are widespread and not limited to specific subgroups. This broad agreement reinforces the idea that financial security is a universal concern among vehicle owners, making special perils coverage an attractive option across different demographics.

However, the slightly lower mean score of 3.67, associated with the desire for broader protection, points to an area where consumer expectations are not fully met. While respondents appreciate the current benefits, this finding reveals a demand for even more comprehensive coverage. Consumers seem to believe that while special perils coverage provides valuable protection, there could be additional features or broader coverage options that would further enhance its value. The findings of this study are consistent with Dzulkipli et al. (2017), who identified attitude and perceived benefits as the primary factors influencing the intention to purchase medical

and health insurance, with the highest mean score values. Similarly, Yeow et al. (2021) revealed that perceived financial benefits significantly impact the intention to purchase health insurance.

For insurance companies, these findings present both a confirmation of the value proposition of special perils coverage and an opportunity for product innovation. The high mean scores related to financial security and risk mitigation should encourage insurers to continue emphasizing these aspects in their marketing and communication strategies. However, the identified gap in perceived coverage breadth suggests that insurers could differentiate themselves by offering expanded or customizable coverage options that address the specific needs and concerns of their customers.

For instance, insurers might consider developing new policy features that extend protection beyond the standard offerings, such as coverage for a wider range of natural disasters or additional services like emergency assistance. These enhancements could be promoted as part of a premium package, catering to consumers who are willing to pay more for greater peace of mind.

Additionally, targeted marketing campaigns that highlight these expanded options could appeal to consumers who are already inclined to purchase special perils coverage but are seeking more comprehensive protection. By addressing the unmet needs revealed by the lower mean score, insurers can not only meet but exceed customer expectations, potentially leading to higher satisfaction rates and a stronger competitive edge in the market.

Conclusion

The findings of this study underscore the urgent need for a more sophisticated and strategic approach to consumer education and marketing within the motor insurance industry. By identifying and addressing gaps in consumer knowledge and effectively communicating the tangible benefits of special perils coverage, insurers have the potential to significantly enhance consumer understanding. This, in turn, can reduce variability in risk perception and drive higher adoption rates of these crucial policies.

As climate-related risks become increasingly frequent and severe, insurance companies are presented with a unique opportunity to strengthen their market position by refining their promotional strategies. Implementing targeted, informative, and differentiated marketing efforts can not only elevate consumer satisfaction but also build stronger customer loyalty and trust. By expanding the scope of protection and tailoring coverage to meet the evolving needs of their customers, insurers can increase the perceived value of their offerings and position themselves as industry leaders in innovation and customer care.

Ultimately, the successful execution of these strategies could contribute to a more resilient and adaptive motor insurance market, one that is better equipped to tackle the challenges posed by climate change and shifting topographical risks. This proactive approach would not only benefit consumers by providing them with more comprehensive protection but also ensure long-term growth and sustainability for insurers that are willing to take the lead in this critical area.

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Examining The Impact of Macroeconomics Factors on Carbon Emissions in Selected 7-ASEAN Members: A Panel Data Analysis

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Abstract: This study investigates the relationships between urbanization, economic growth, energy consumption, transportation, and carbon emissions in seven ASEAN countries from 2011 to 2022. As released by the World Health Organization (WHO), more than 80 percent of the world's population living in urban areas were exposed to air quality levels that were above the WHO limits. The region that is most affected comes from those nations categorized as low to middle-income countries. Hence, it is best to examine why these 7 ASEAN nations categorized from the lower to upper-middle income countries are not able to control the increase in the level of their carbon emissions. The analysis would also identify the appropriate empirical model suitable for the data. Using panel data analysis applying econometric modeling which are the Pooled Ordinary Least Square, Fixed Effects Model, and Random Effects Model, the findings support the Environmental Kuznets Curve hypothesis, revealing that urbanization and economic growth significantly increase carbon emissions. The study emphasizes the need for renewable energy adoption and sustainable urban planning to reduce carbon footprints. Key recommendations include enhancing energy efficiency and promoting cleaner transportation technologies to achieve sustainable economic growth in the ASEAN region.

Keywords: *Carbon Emissions, Urbanization, Economic Growth, Energy Consumption, Transportation, 7-ASEAN, Environmental Kuznets Curve, Panel Data Analysis*

1. Introduction and Background

As countries grow economically, carbon consumption and emissions increase, leading to significant environmental consequences. The Environmental Kuznets Curve (EKC) hypothesis suggests that emissions rise until economic growth reaches a turning point, after which they decline (Salari, 2020; Munir, 2020). Large populations and industrial activities drive this trend through increased energy and transportation demands. Technological advancements and sustainable energy sources are essential for achieving economic growth while limiting emissions, benefiting the Human Development Index (HDI) through cleaner energy consumption (Yumashev et al, 2020). Urbanization in ASEAN countries fuels economic development but also raises carbon emissions due to higher energy consumption and transportation needs. By 2020, ASEAN's urban population reached 310 million, with significant growth expected (ASEAN Secretariat, 2021). Sustainable urban planning and green technologies are crucial to mitigate these impacts (Ritchie & Roser, 2020). Economic growth, measured by GDP, correlates with increased energy use and carbon emissions. ASEAN's GDP grew by 5.5% in 2022 post-pandemic (World Bank, 2023).

The region's energy demand is projected to double by 2040, with fossil fuels still dominating (International Energy Agency, 2023). Transitioning to renewable energy is vital for reducing emissions, with the ASEAN Plan of Action for Energy Cooperation aiming for 23% renewables by 2025 (ASEAN Centre for Energy, 2022). The transportation sector significantly contributes to carbon emissions due to increased vehicle usage and inadequate public transportation infrastructure. Sustainable solutions like electric vehicles and improved public transportation are necessary to mitigate this impact (ASEAN Automotive Federation, 2023). The ASEAN region's rapid economic growth has led to increased energy consumption and carbon emissions, exacerbated by population growth. This trend poses significant environmental and health challenges and impacts the transportation sector, which is crucial for socio-economic development (Li et al., 2022). Despite global efforts to reduce carbon emissions, the complex relationship between emissions, transportation efficiency, and human welfare remains underexplored, hindering effective policy formulation. The need to balance economic growth with environmental sustainability and improve transportation infrastructure is critical for achieving sustainable development goals in the region.

2. Literature Review

Understanding the interactions between economic growth, carbon emissions, energy consumption, and human development is key to sustainable development. The Environmental Kuznets Curve (EKC) hypothesis suggests that environmental degradation initially rises with economic growth but declines after reaching a certain income level. However, the income level at which this decline occurs is debated (Dinda, 2004). Around twenty factors, including energy types, trade, investment, urbanization, technology, human capital, literacy, democracy, corruption, financial development, income inequality, tourism, and natural resources, influence CO2 emissions (Adamu et al, 2020) Adopting a multidimensional approach that considers social, economic, and environmental factors is essential for sustainable development and reducing carbon emissions. Hence, urbanization, economic growth, energy consumption, and transportation should be categorized as independent variables. While carbon emission is the dependent variable.

Urbanization and Carbon Emissions: Numerous studies have explored the correlation between urbanization and carbon emissions. Urban areas tend to have higher emissions per capita due to increased energy use and industrial activity (Kennedy et al., 2010). Rapidly urbanizing regions often face challenges with environmental regulations (Seto et al., 2012). Sustainable urban development policies, such as promoting public transportation and energy efficiency, are crucial (Wang, 2021; Alshehhi, 2021). Therefore, this leads to the first hypothesis (H1) of this study that is:
H1: There is a relationship between urbanization and carbon emissions

Energy Consumption and Carbon Emissions: Higher energy consumption, particularly from fossil fuels, is directly associated with increased CO2 emissions (Ang, 2007) Renewable energy adoption and energy efficiency improvements are necessary to mitigate emissions (Liu et al., 2020). The relationship between human development and carbon emissions varies, with higher development often leading to increased emissions (Shahbaz et al, 2012; Sinha and Shahbaz, 2019). Hence, a hypothesis is formed as H2 below:
H2: There is a relationship between energy consumption and carbon emissions.

Economic Growth and Carbon Emissions: Economic growth often leads to higher carbon emissions, although this relationship can be complex. The Environmental Kuznets Curve (EKC) hypothesis suggests that emissions rise with economic growth up to a point, then decline (Dinda, 2004). However, this varies with economic development levels. Policies promoting sustainable growth and energy efficiency are vital (Stern, 2006). Hypothesis H3 therefore recognizes the role of the reward system towards employee productivity.
H3: There is a relationship between economic growth and carbon emissions

Transportation and Carbon Emissions: Transportation significantly contributes to carbon emissions. Promoting public transportation, adopting electric vehicles, and improving urban planning can reduce these emissions (Wang et al., 2023). Regulatory standards and innovative technologies are essential for achieving significant emission reductions in the transportation sector (Davis et al., 2018). Thus, the following hypothesis is formed.
H4: There is a relationship between transportation and carbon emissions

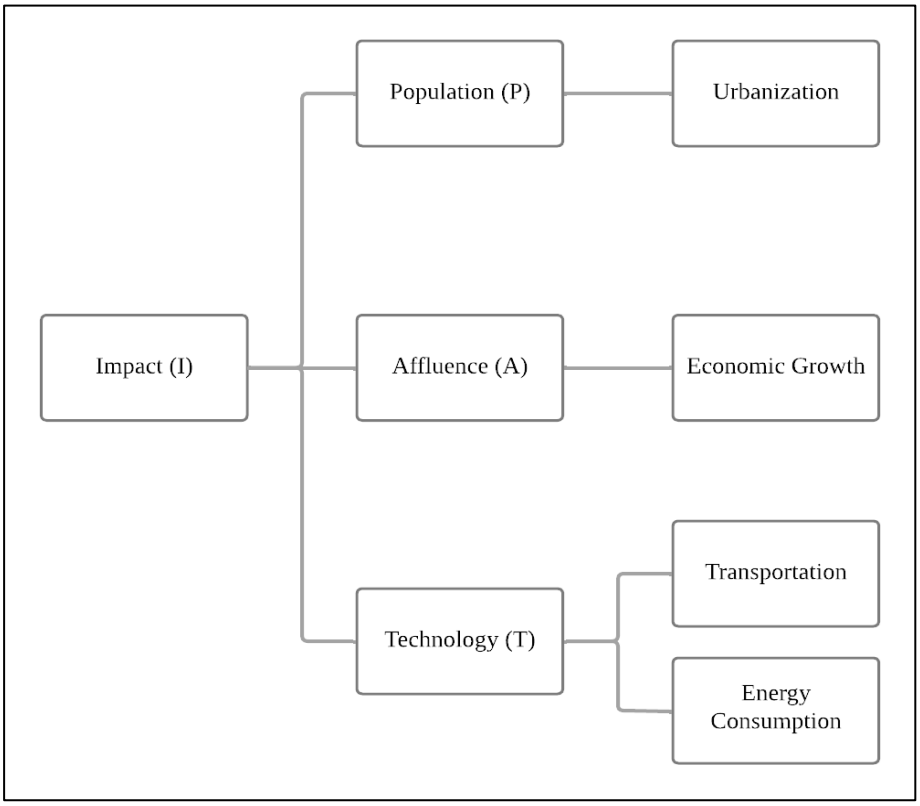
3. Research Methodology

The Environmental Kuznets Curve (EKC) hypothesis is a prominent theory that explores the relationship between economic growth and environmental degradation, including carbon emissions. According to this hypothesis, initially, as economies develop and income levels rise, environmental degradation increases. However, beyond a certain income threshold, environmental degradation starts to decline over time. In this research, a model of IPAT is being used to determine the environmental impact of the study variables. The IPAT model, also known as the I = PAT model, is a theoretical framework used to understand the environment.

Impact of human activities. It represents how human activities contribute to environmental degradation and resource depletion (Ehrlich and Holdren, 1971). The model breaks down environmental impact (I) into three components which are Population (P), Affluence (A), and Technology (T). The IPAT model provides a simple framework to understand how these three factors interact and contribute to environmental impact. It is often

used in discussions about sustainability and environmental policy to identify strategies for reducing human impact on the environment. The model highlights the need for sustainable development and the importance of addressing population growth, consumption patterns, and technological choices to achieve environmental sustainability (Ehrlich and Holdren, 1971).

Figure 1: The Research Framework



Econometric Modelling

Based on the previous literature review and theory, the dependent variable and independent variables were expected to relate to each other. The regression model into a double log-linear model can standardize the gap values between the variables since the variables have differences in the unit of measurement The equation below shows the relationship between the variable chosen:

$$LCO2_{it} = \beta_0 + \beta_1 LU_{it} + \beta_2 LGDP_{it} + \beta_3 LEG_{it} + \beta_4 LSMV_{it} + \varepsilon_{it} \quad (1)$$

However, in the context of panel data, two types of variability are recognized between cross-sectional units and within time series units. Between variance refers to the observed inter-unit or cross-sectional variation, while internal variance measures the extent to which the total variance is attributable to variation within economic units. These variations can be detected using random-effects and fixed-effects models. Essentially, both econometric models take into account heterogeneity and individuality between nations and can have their intercept values while constraining the slope to be homogeneous. To accommodate such heterogeneity, the error term ε_{it} is decomposed into two independent components:

$$\varepsilon_{it} = \lambda_i + \mu_{it} \quad (2)$$

λ_i is termed as an individual-specific effect meaning each nation may have a unique characteristic such as in this case a high-income and lower-income country or even a type of urbanization definition as well as an education system. For μit is a normal error term denoting the remainder disturbance. Hence, the equation if the random effect model is chosen would be:

$$LCO2_{it} = \beta_0 + \beta_1 LU_{it} + \beta_2 LGDP_{it} + \beta_3 LEG_{it} + \beta_4 LSMV_{it} + \lambda_i + \mu_{it} \quad (3)$$

On the other hand, the fixed effect model assumes each specific effect to have intercepts that may vary across countries. Hence, the equation if the fixed effect model is chosen would be:

$$LCO2_{it} = (\beta_0 + \lambda_i) + \beta_1 LU_{it} + \beta_2 LGDP_{it} + \beta_3 LEG_{it} + \beta_4 LSMV_{it} + \mu_{it} \quad (4)$$

To identify the coefficient of the independent variables toward the dependent variables, the hypothesis for the overall research will be as below:
H_0: The coefficient of the independent variable is equal to zero (no impact on the dependent variable).
H_1: The coefficient of the independent variable is not equal to zero (has a significant impact on the dependent variable).

Data and Variables

Table 1: Data and Variables

Variable	Key Title	Definition	Measurement	Source
CO2 emissions (CO2)	Dependent Variable	Annual total emissions of carbon dioxide (CO_2), excluding land-use change.	CO2 in tonnes	Our World Data
Urbanization (U)	Independent Variable	Urban population refers to people living in urban areas as defined by national statistical offices.	Total urban population in person	World Bank
Economics Growth (*GDP*)	Independent Variable	GDP per capita is gross domestic product divided by midyear population.	GDP per capita (current US$)	World Bank
Energy Consumption (*EG*)	Independent Variable	Annual average electricity generation per person.	Electricity generation per capita in kilowatt-hours	Our World Data
Transportation (*SMV)*	Independent Variable	Total sales of motor vehicles that include passenger vehicles and commercial vehicles	Total sales of motor vehicles in unit	ASEAN Automotive Federation

4. Results

The study has 84 observations throughout the year from 2011 to 2022 for 7 selected ASEAN member nations i.e. Malaysia, Indonesia, Brunei, Thailand, Philippines, Singapore, and Vietnam. The results are acceptable as per discussion since the data are collected from reliable sources. An array of appropriate econometric and statistical analyses is utilized to ensure a consistent empirical analysis is conducted.

Descriptive Statistics
Table 2 shows the descriptive statistics analyzed for both independent and dependent variables. The data spanning from 2011 to 2022, provides a comprehensive view of several key development indicators across multiple nations, focusing on CO_2 emissions (CO_{2it}), total urban population (U_{it}), GDP per capita (GDP_{it}), energy generated per capita (EC_{it}), and the total of transportation (SMV_{it}).

Table 2: **Descriptive Analysis**

	$CO2_{it}$	U_{it}	GDP_{it}	EG_{it}	SMV_{it}
Mean	2.16E+08	41281426	17906.63	4437.09	452540.2
Median	2.14E+08	31298700	6238.962	2505.737	337459
Maximum	7.29E+08	1.60E+08	88428.7	12994.19	1436335
Minimum	6933290	302374	1953.557	717.786	10949
Std. Dev.	1.79E+08	44823393	21990.09	3783.214	400576.6
Skewness	0.897275	1.551394	1.450337	0.749014	0.601559
Kurtosis	3.177309	4.275652	3.887038	2.094519	2.154353
Jarque-Bera	11.38146	39.39106	32.20262	10.72394	7.569135
Probability	0.003377	0	0	0.004692	0.022719
Sum	1.82E+10	3.47E+09	1.50E+06	3.73E+05	38013374
Sum Sq. Dev.	2.67E+18	1.67E+17	4.01E+10	1.19E+09	1.33E+13
Observations	84	84	84	84	84

As seen in Table 2, the dataset provides key statistical insights into CO_2 emissions, urbanization, GDP, and transportation. The mean values, such as 2.16E+08 for CO_2 emissions (CO_{2it}), 41,281,426 for urbanization (Uit), and 17,906.63 for GDP (GDP_{it}), offer a broad understanding of average levels over the period. Median values, including 2.14E+08 for $CO2_{it}$ and 6,238.962 for GDP_{it}, highlight central data points less affected by extremes. The range of data indicates significant variability, with GDP_{it} ranging from 1,953.557 to 88,428.70 and transportation (SMV_{it}) from 10,949.00 to 1,436,335. Standard deviations further reflect this variability, showing considerable dispersion around the mean. Positive skewness in GDP_{it} (1.45) and Uit (1.55) suggests distributions with longer right tails, while kurtosis values, such as 4.28 for urbanization, imply more frequent extreme values. The Jarque-Bera test results indicate a non-normal distribution for most variables, necessitating non-parametric methods for further analysis. With 84 observations for each variable, this descriptive statistical analysis establishes a foundation for deeper inferential studies, highlighting key trends and disparities within the dataset.

Correlation Analysis

Table 3 summarizes the results of the correlation analysis. It provides the correlation for each variable. The dataset reveals significant correlations between key variables and CO2 emissions.

Table 3: Correlation Matrix Analysis

Variable	$CO2_{it}$	U_{it}	GDP_{it}	EG_{it}	SMV_{it}
$CO2_{it}$	1				
Uit	0.887747 (0.0000)*	1			
$GDPit$	-0.585018 (0.0000)*	-0.5183 (0.0000)*	1		
$EGit$	-0.655323 (0.0000)*	-0.660176 (0.0000)*	0.827549 (0.0000)*	1	
$SMVit$	0.81097 (0.0000)*	0.670821 (0.0000)*	-0.556818 (0.0000)*	-0.590147 (0.0000)*	1

*p-value is significant at the 0.05 level (2-tailed).

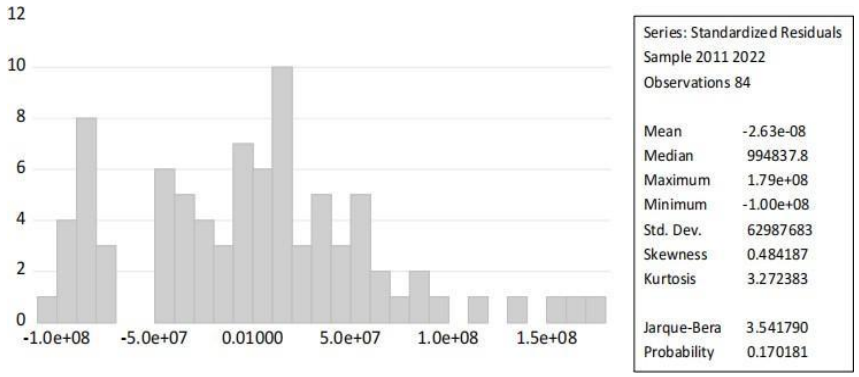
There is a strong positive correlation between CO_2 emissions and urbanization (0.887747), indicating that as the urban population grows, emissions increase significantly, supported by a t-statistic of 17.46322 and a p-value of 0.0000. This aligns with studies like Sun et al. (2022), which link urbanization to higher emissions due

to increased energy use and transportation demands. Conversely, GDP per capita has a negative correlation with CO2 emissions (-0.585018), with a t-statistic of -6.531981 and p-value of 0.0000, supporting the Environmental Kuznets Curve hypothesis that economic growth initially increases emissions but later decreases them due to better energy efficiency and technology (Wang & Su, 2019).

Energy consumption per capita also shows a strong negative correlation with CO2 emissions (-0.655323), with a t-statistic of -7.856248 and p-value of 0.0000, suggesting that higher energy efficiency and cleaner energy sources reduce emissions (Sun & Huang, 2020). Additionally, motor vehicle sales have a significant positive correlation with CO2 emissions (0.810970), with a t-statistic of 12.55136 and p-value of 0.0000, linking increased vehicle usage to higher emissions (Sun et al., 2022). Overall, the analysis highlights the impact of urbanization and transportation on emissions, while GDP per capita and energy consumption per capita have more complex influences moderated by economic and technological factors.

Normality Analysis

Table 4: Summary of Normality Analysis



The standardized residuals have a mean of -2.63e-08, close to zero, indicating they are centered around the mean. The standard deviation of 62987683 indicates its variability whereas the skewness of 0.484187 suggests a slight positive skewed. The value of kurtosis which is 3.272383 is close to normal and more importantly the insignificant of the Jarque-Bera test indicates that the residuals are normally distributed. Consequently, this supports the validity and reliability of the regression model.

Panel Data Analysis

Table 5 presents the Panel Data Analysis between the Pooled OLS model, Fixed Effect Model, and Random Effect Model.

Table 5: Results of Panel Data Analysis: Pooled, Fixed and Random Effects Models

Model	Pooled	Fixed	Random
C	39923392 (0.0691)**	-164E+08 (0.0000)*	-126E+08 (0.0104)*
$LUit$	2.514561 (0. 0000)*	6.949834 (0.0000)*	5.830096 (0.0000)*
$LGDPit$	-909.1336 (-0.126)	272.3406 (-0.6525)	275.5442 (-0.6321)
$LEGit$	3280.68 (-0.3916)	12602.4 (0.0218)*	15425.27 (0.0013)*
$LSMVit$	164.5868 (0.0000)*	71.99216 (0.0040)*	62.29263 (0.0085)*
R-squared	0.876486	0.981293	0.647258

*p-value is significant at 0.05 level

The Pooled OLS regression results show a significant positive relationship between urban population (LU_{it}) and CO_2 emissions (LCO_{2it}), with a coefficient of 2.514561, t-statistic of 10.45439, and p-value of 0.0000. GDP per capita ($LGDP_{it}$) has an insignificant negative effect on emissions (coefficient: -909.1336, p-value: 0.1260). Energy generation per capita (LEG_{it}) also shows an insignificant positive relationship with emissions (coefficient: 3280.680, p-value: 0.3916). Motor vehicle sales ($LSMV_{it}$) significantly increase emissions (coefficient: 164.5868, p-value: 0.0000). The model's R-squared is 0.876486, explaining 87.65% of emissions variability. These results emphasize the impact of urban growth and transportation on emissions, suggesting the need for targeted policies.

In the Random Effect Model, the analysis reveals that urban population (LU_{it}) significantly increases CO2 emissions ($LCO2_{it}$) with a coefficient of 5.830096, a t-statistic of 11.96177, and a p-value of 0.0000. Energy generation per capita (LEG_{it}) also shows a significant positive relationship with emissions, with a coefficient of 15425.27, and a p-value of 0.0013. Transportation ($LSMV_{it}$) contributes to higher emissions, indicated by a coefficient of 62.29263, and p-value of 0.0085. GDP per capita ($LGDP_{it}$) has a positive but statistically insignificant effect on emissions (coefficient: 275.5442, p-value: 0.6321), reflecting mixed results in the literature. The model's overall fit is robust, with an R-squared value of 0.647258 and an adjusted R-squared of 0.629398, explaining 64.73% of emissions variability. These results highlight the significant impact of urban growth and transportation on emissions, with more complex roles for GDP per capita and energy consumption.

The Fixed Effect results indicate that the urban population (LU_{it}) significantly increases carbon emissions ($LCO2_{it}$), with a coefficient of 6.949834, t-statistic of 10.95493, and p-value of 0.0000, suggesting higher emissions with urban growth (Wang et al., 2021). Energy generation per capita (LEG_{it}) also significantly impacts emissions, with a coefficient of 12602.40, t-statistic of 2.343718, and p-value of 0.0218,

highlighting the role of energy consumption (Sun et al., 2022). Transportation ($LSMV_{it}$) has a positive impact on emissions, with a coefficient of 71.99216, a t-statistic of 2.975761, and a p-value of 0.0040, indicating higher vehicle usage increases emissions (Tang et al., 2021). GDP per capita ($LGDP_{it}$) shows a positive but statistically insignificant effect on emissions, with a coefficient of 272.3406, t-statistic of 0.452104, and p-value of 0.6525, reflecting mixed findings in the literature (Wang & Su, 2019). The model is robust, with an R-squared value of 0.981293, explaining 98.13% of emissions variability, confirming the significance of urban population, energy consumption, and vehicle sales as primary drivers of carbon emissions.

In analyzing the three-panel data models-Pooled OLS, Fixed Effects, and Random Effects-the Fixed Effects model is the most suitable for representing the relationship between the variables and annual CO2 emissions. It has the highest R-squared value (0.9813), explaining 98.13% of the variance in CO2 emissions, compared to the Pooled OLS (0.8765) and Random Effects (0.6473) models. The Fixed Effects model's significant F-statistic indicates a good fit, with significant coefficients for urban population, energy per capita, and vehicle sales, showing these variables strongly influence CO_2 emissions. The Fixed Effects model accounts for unobserved heterogeneity with individual-specific intercepts, reducing omitted variable bias.

The Hausman test conducted further supports this model over the Random Effects model due to a lower probability value, indicating a correlation between regressors and the error term. Supporting literature that has similar results Ouyang et al. (2020) also demonstrated the effectiveness of the Fixed Effects model in environmental analyses. Therefore, the Fixed Effects model would be the best choice for analyzing the determinants of CO_2 emissions using the data.

Hausman Test

Table 6: Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	12.156931	4	0.0162*

*p-value is significant at 0.05 level

The Hausman test for cross-section random effects in the panel data analysis produced a Chi-square statistic of

12.156931 with a p-value of 0.0162. Since the p-value is less than 0.05, the null hypothesis that the preferred model is the random effects model is rejected. This result indicates that there are significant differences between the fixed and random effects estimates, suggesting that the fixed effects model is more appropriate for your data. Hence the equation can be shown as:

$LCO2_{it}$ = -1.64E+08+ 6.949834LU_{it} + 272.3406$LGDP_{it}$ + 12602.4LEG_{it} + 71.99216$LSMV_{it}$ + μ_{it}

Discussion

The analysis of the descriptive statistics, correlation matrix, panel data models, and the Hausman test offers valuable insights into the determinants of CO2 emissions across the selected ASEAN countries from 2011 to 2022. The descriptive statistics reveal substantial variability in the dataset, with skewed distributions and non-normality, necessitating careful selection of modeling approaches. The correlation matrix indicates strong relationships between CO2 emissions and key variables such as urbanization, GDP per capita, energy generation, and transportation, with urbanization and transportation showing the most significant positive correlations.

The panel data analysis demonstrates that among the three models-Pooled OLS, Fixed Effects, and Random Effects-the Fixed Effects model is the most robust and appropriate for this dataset. The Fixed Effects model captures 98.13% of the variance in CO2 emissions, making it the best fit, particularly due to its ability to account for unobserved heterogeneity across countries. The significant coefficients for urbanization, energy generation per capita, and transportation suggest that these factors are primary drivers of CO2 emissions, highlighting the need for policy interventions in these areas.

The Hausman test further confirms the superiority of the Fixed Effects model, rejecting the Random Effects model and validating the fixed effects approach in dealing with individual-specific characteristics. This finding aligns with existing literature, which often favors the Fixed Effects model in environmental studies due to its precision in capturing country-specific effects. Therefore, the results underscore the critical impact of urbanization, energy consumption, and transportation on CO2 emissions in the ASEAN region, emphasizing the importance of targeted policies to mitigate environmental impacts.

5. Conclusion and Recommendations

Based on the analyses conducted, the findings revealed that urbanization significantly increases carbon emissions due to higher energy demand and transportation needs. Economic growth initially raises emissions, but advanced economies can reduce emissions through cleaner technologies and improved energy efficiency. Energy consumption, especially from fossil fuels, is a major driver of emissions, highlighting the need for a shift to renewable energy (Thu Huong & Xuan, 2022). The transportation sector also contributes significantly to emissions, necessitating improvements in public transport and the promotion of electric vehicles (Poulova et al., 2021). The policy implications are clear of which government should promote renewable energy (RE) by incentivizing solar, wind, and hydroelectric power to reduce reliance on fossil fuels (International Energy Agency, 2023). Thus, ASEAN has taken initiatives under its Energy Policy focusing on deploying these RE potentials to promote a higher share of RE in the power generation mix.

Effective urban planning and the development of sustainable infrastructure, such as public transportation, energy-efficient buildings, and green spaces, are essential to mitigate the environmental impacts of urban growth (Chien et al., 2022). Economic incentives, including tax benefits for green technologies, subsidies for clean energy, and penalties for excessive emissions, can drive businesses and individuals toward sustainability (Destek & Aslan, 2020). ASEAN leaders in 2018 have established a collaborative platform known as ASEAN Smart Cities Network (ASCN) of which cities from the ten members work towards the common goal of smart and sustainable urban development. Considering the opportunities and challenges posed by rapid urbanization and digitalization, the primary goal of the ASCN is to improve the lives of its citizens, using technology as an enabler. It adopts an inclusive approach to smart city development that is respectful of human rights and fundamental freedoms as inscribed in the ASEAN Charter.

Future research should focus on several key areas to advance understanding of the relationship between

macroeconomic factors and carbon emissions in ASEAN countries. Longitudinal studies can capture long-term trends and dynamic relationships, providing deeper insights into how macroeconomic factors impact emissions over time (Uzar, 2020). Sectoral analysis can offer detailed insights into specific emission drivers within different sectors, enabling more effective targeted policies (Danish & Wang, 2019). Additionally, exploring the impact of technological advancements such as digitalization, automation, and innovation on reducing emissions is crucial (Nathaniel et al., 2021). Understanding the behavioral aspects of energy consumption can inform more effective policies by shedding light on the social dimensions of sustainability (Al-Mulali et al., 2020). Comparative studies between ASEAN countries and other regions can highlight successful strategies and areas for improvement (Adebayo et al., 2022). Finally, addressing potential endogeneity issues and exploring alternative methodologies will enhance the robustness of future studies. By focusing on these areas, future research can provide comprehensive insights to support effective and sustainable policy development in the ASEAN region.

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Energy Consumption, Emission, Transportation Sector in Malaysia: Review on Malaysia's Road Transport

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Abstract: Transportation is a major challenge for energy conservation, with road transport in Malaysia being a significant contributor to greenhouse gas (GHG) emissions. In Malaysia, traditional fossil fuels such as gasoline and diesel dominate the transportation sector, which has become the second-largest source of GHG emissions, accounting for 20% in 2014. This increase in CO2 emissions, driven by rising vehicle ownership and economic growth, underscores the urgent need for effective emission reduction strategies. The rapid growth in road transportation in Malaysia is linked to socioeconomic factors, including rising incomes and urbanization, leading to higher energy consumption and pollution. Data indicates a significant increase in vehicle registrations from 1990 to 2018, with motorcars and motorcycles being the most common. This growth, fueled by subsidies and decentralization, has exacerbated the sector's environmental impact. The Green Technology Master Plan Malaysia 2017–2040 aims to address these issues by setting ambitious targets to enhance renewable energy, improve energy efficiency, and promote eco-friendly fuels. Key strategies include expanding public transportation, increasing the adoption of electric vehicles (EVs), and introducing alternative fuels like hydrogen. Malaysia has substantial potential to reduce CO2 emissions through initiatives such as expanding EV infrastructure, promoting natural gas vehicles, and improving public transit. Effective implementation of these strategies can significantly lower the transportation sector's carbon footprint, contributing to a more sustainable future.

Keywords: *Energy Consumption, Emission, Transportation, Road Transport, Carbon Dioxide (CO_2)*

1. Introduction

One of the most difficult areas for energy conservation is road transportation. Transportation-related consumption accounts for an increasing percentage of total gasoline consumption. In Malaysia, traditional fossil fuels such as gasoline, diesel, and electricity are still used for transportation and these activities produce millions of tonnes of greenhouse gases (GHG) every year. According to the United Nations Framework Convention on Climate Change (UNFCC), the transportation sector has consistently remained the country's second-largest source of greenhouse gas emissions, accounting for 20% of total GHG emissions in 2014. Malaysia is an oil-based economy, with almost all economic sectors, from industry to transportation to domestic operation, relying on fossil fuels in general and oil energy in particular (Azam et al., 2015)

Furthermore, CO2 emissions have risen rapidly in recent decades, and these massive CO2 emissions from the burning of fossil fuels, as well as their climatic effects, have become important issues that must be addressed. Electricity generation, transportation, industrial, and residential are the main sectors identified to contribute to the emission of CO2 in Malaysia.

Table 1 shows the global final energy consumption from 1973 to 2016. The growth of global final energy consumption has increased by 3752.8 Mtoe from 1973 to 2008. Then, for just 8 years, there is a spike increase of around 48789.5 Mtoe (2008-2016). The major contributors to growth were the transportation sectors which increased almost 14.7% from 2008 to 2016. Road transportation is the largest contributor to emissions in the transport sector which about 18% comes from it. From the trend of total road transport as shown in Figure 1, demand for road transport is unlikely to decrease in the future as it shows a positive increase from the year

1990 to 2018 and still moving upward.

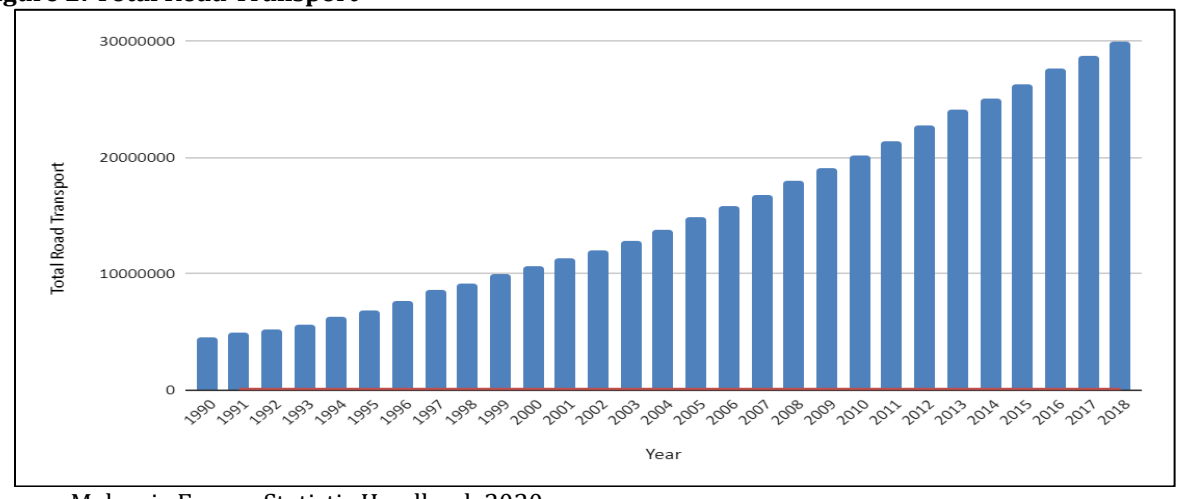
Table 1: Global final energy consumption by sector

Sector	1973		2008		2016	
	Mtoe	Share (%)	Mtoe	Share (%)	Mtoe	Share (%)
Industry	1544.6	33.0	2345.1	27.8	16019	28
Transport	1081.2	23.1	2299.4	27.3	24004	42
Agriculture/Commerce/Civil	1764.6	37.7	3036.9	36.0	8464	14.7
Non-energy use	285.3	6.1	747.1	8.9	8729	15.3
TOTAL	**4675.7**	**100**	**8428.5**	**100**	**57218**	**100**

Source: Malaysia Energy Statistic Handbook 2020

Malaysia's private vehicle population has risen year after year, owing to increasing income levels and unregulated city growth. This leads to an increase in energy consumption, especially from fossil fuels, and, as a result, an increase in air pollution as a result of their combustion. Since transportation systems rely on petroleum oil, which is a limited resource in Malaysia, it is essential to prepare for energy efficiency in this sector to reduce the rapid use of petroleum oils and increase air pollution, especially CO2. According to Dai et al., (2023), improvements in transport infrastructure are associated with increased economic growth. However, this growth often leads to higher CO2 emissions from the transport sector due to increased vehicle usage and fossil fuel consumption. This worrying number certainly caused the government of Malaysia to commit to a deep cut in CO2 emissions by reducing 45% in the year 2030 (Ooi & Amran, 2019). Segar et al., (2024) also predict specific emission levels for the coming years, underscoring the urgent need for effective mitigation strategies. To make it come true, reduction of CO2 emissions from road transport is important. This can be done by improving the governance of regulators' principles and guidelines (Peiseler & Serrenho, 2022). This is because having better administration, more effective compliance and targeted enforcement of regulation can help to achieve the desired outcomes most efficiently. As a result of the aforementioned concerns about CO2 emissions in road transportation, a study is needed to investigate effective policy options in the context of Malaysia. This paper focuses on analyzing energy use and emissions in road transportation in Malaysia, to investigate the optimal level of CO2 emissions that can be reduced from this sector.

Figure 2: Total Road Transport



Source: Malaysia Energy Statistic Handbook 2020

2. Road Transportation Pattern in Malaysia

Transportation networks are inextricably linked to socioeconomic shifts because of the versatility it offers. In addition, transportation infrastructures can ensure access to markets and services, thus economic opportunities are likely to emerge. Transportation networks on a global, regional, and local scale have all become critical components of economic activity. As a result, trade and distribution are becoming increasingly

important. However, while transportation has a positive effect on socioeconomic structures, it also has drawbacks such as traffic congestion, accidents, mobility gaps, and environmental impact.

The ever-increasing demand for transportation and the expansion of the road network in Malaysia signify the rapid growth of road-based motorization. According to the Department of Statistics (2012), Malaysian road transport is predominantly composed of motorcars, motorcycles, taxis, buses, and goods vehicles. Table 2 shows the percentage of registered road transport vehicles in Malaysia for various years. With 47% and 46%, respectively, motorcars and motorcycles are the most popular modes of transportation correspondingly. The table also shows spectacular rises in motor vehicle registration rates and it is obvious that Malaysia's rapidly expanding car market is a direct result of stellar economic success and the significant economic contribution they make to the country's overall growth.

Table 2: Registered Road Transport Vehicles in Malaysia

Year	Motorcars	Motorcycles	Taxi	Busses	Good vehicles	Others	Total
1990	33.15	55.58	0.63	0.49	6.96	3.19	100
1995	37.02	52.32	0.80	0.52	6.39	2.95	100
2000	39.12	50.54	0.63	0.46	6.28	2.98	100
2005	43.69	47.30	0.53	0.39	5.43	2.66	100
2009	44.73	47.01	0.42	0.35	4.92	2.57	100
2014	53.42	40.50	0.54	0.10	3.12	1.90	100
2018	47.12	46.46	1.04	0.08	3.33	2.42	100

Source: Malaysia Energy Statistic Handbook 2020

Based on the growth of road transport shown in Table 3 below, from about 4.5 million in 1990 to 29.5 million in 2018, the number of motor vehicles in Malaysia increased by 7.1 percent per year on average. From this growth, passenger cars and motorcycles contribute to about 94% of the vehicles in the country. There are several reasons leading to the rapid growth in total road transportation in Malaysia.

Table 3: Growth of total transport in Malaysia from year 1990 to 2018

Year	Total Road Transport	Growth
1990	4,547,414	9.44
1995	6,897,434	10.3
2000	10,598,804	6.74
2005	14,816,407	7.64
2010	20,188,565	6.17
2015	26,301,952	4.78
2016	27,611,846	4.98
2017	28,737,696	4.08
2018	29,956,292	4.24

Source: Malaysia Energy Statistic Handbook 2020

Increased population size and disposable incomes, as well as fuel subsidies and decentralization, all lead to a rise in the number of vehicles in Malaysia. Malaysia's national car schemes have also contributed to the growth of motor vehicles by narrowing the government's options. The rapid rise in vehicle numbers was also helped by the growing population and urbanization. According to Dargay and Gately (1999), there is a positive relationship between wages, GDP, and transportation demand. This is factual in Malaysia, where rising GDP and income have made private motor vehicles more affordable and led to the growing demand for transportation services (Kasipillai and Chan, 2008). The debate over fuel subsidies, including their eventual reduction or removal, has direct implications for Malaysia's transportation sector, which consumes 40% of the country's total resources and is entirely reliant on fossil fuels (Oh et al., 2018). Subsidies obscure the true cost of transportation, meaning that motor vehicle users do not currently pay the full cost of travel, including

externalities like emissions, congestion, and injuries (Meyer et al., 1965). Consequently, Malaysia has experienced rapid motorization due to these artificially low prices. In terms of motor vehicle use, decentralization is a double-edged sword. Decentralization resulted in the same travel times, longer distances, and less congestion. As a result of public transportation's failure to reach many of the outlying areas, car dependence grew. Moreover, Malaysia's public transportation system is also in its infancy, thus due to the lack of established public transportation and high mobility, the number of private transportation grew rapidly in tandem with rising economic capability (Mustapa & Bekhet, 2016).

3. Emissions

According to Danielis (1995), it has been found that atmospheric concentrations of greenhouse gases such as carbon dioxide (CO2), sulfur dioxide (SO2), carbon monoxide (CO), sulfur dioxide (SO2), and nitrogen oxide (NOx) have increased in recent decades. All these gases significantly have a negative environmental impact. This effect is linked to the rising transportation trend. As mentioned earlier, the transportation sector is the world's second-largest source of carbon emissions, with road transportation accounting for a significant portion of this. According to Zhu et al (2019), the road transportation industry in six Asia-Pacific countries such as Australia, Canada, China, India, Russia, and the United States already accounts for more than half of the global transportation industry's carbon emissions.

In Malaysia, the transportation sector accounts for 28% of total CO2 emissions, of which 85% comes from road transport (Mustapa, & Bekhet 2016). Since conventional vehicles also use fossil fuels as their primary energy source, transportation is one of the major contributors to greenhouse gas (GHG) emissions. Furthermore, transportation-related CO2 emissions are the fastest-growing source of CO2, with the vast majority of estimated rises coming from developing countries. According to Ong et al. (2012), the transportation sector is contributing an increasing share of total emissions. Chandran and Tang (2013) state that energy consumption in the road transportation sector contributes significantly to environmental pollution in Malaysia, especially CO2 emissions. Solaymani (2022) identifies trends and patterns in transport-related CO2 emissions over recent years, showing an increasing trajectory largely driven by economic growth, urbanization, and rising vehicle ownership.

Figure 2 below shows the final energy consumption for every sector in Malaysia. Since 1997, the transportation sector has shown high energy consumption, and this reinforces the fact that transportation is the largest contributor to CO2 emissions.

Figure 2: Final Energy Consumption in Malaysia, Sources: Ahmad et. al., (2021)

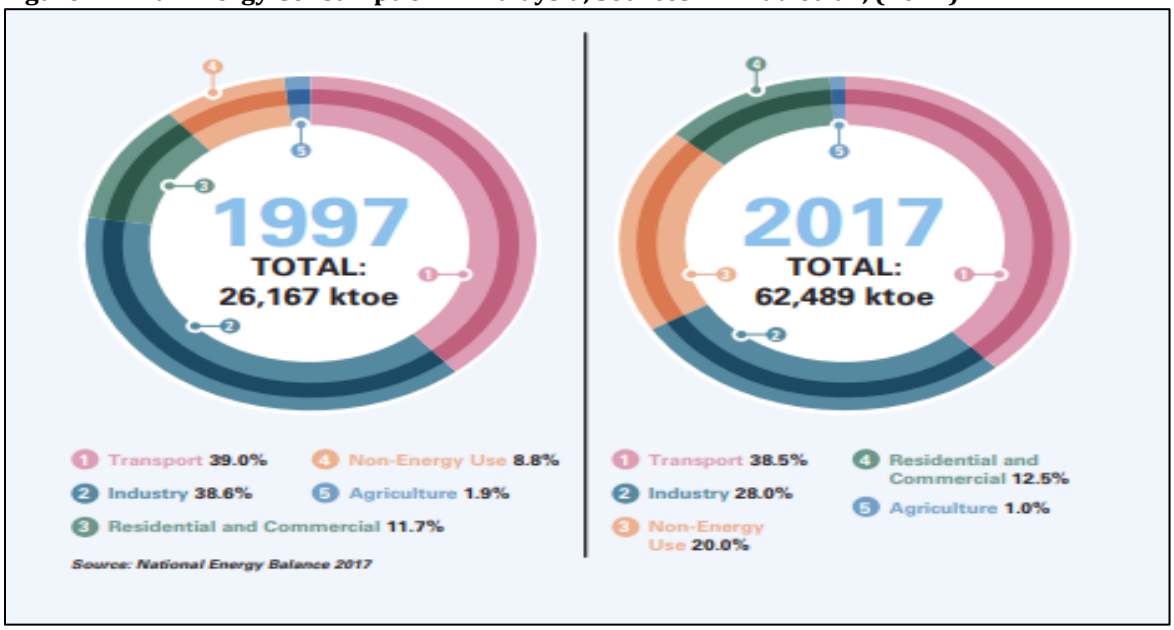


Table 4 shows the trend of energy use by the transportation sector based on fuel types in Malaysia. The transportation sector's overall energy usage rose from 7.83 Mtoe in 1995 to 24 Mtoe in 2016. With an average growth rate of 5.7 percent, this strong growth rate is more than double that of the previous year. In Malaysia, coal, diesel, aviation turbine fuel (AVF), aviation gasoline (AV gas), fuel oil, natural gas, and electricity were all used in the transportation sector. The primary source of energy is fossil fuel, with petrol being the most common, followed by diesel, ATF, and AV gas. Thus, it depicts petroleum products, with diesel and petrol accounting for more than 70% of crude oil products, the two most popular transportation fuels in Malaysia. Based on this fact, petrol consumption in the transportation sector was the primary driver of growth in 2016, with a positive trend of 6% in 2016.

Table 4: Energy use by the transportation sector in Malaysia

Year	Petrol	Diesel	ATF and AV gas	Fuel Oil	Natural gas	Biodiesel	Electricity	Total
1995	4477	2168	1160	17	5	0	0	7827
1996	5161	2417	1335	32	4	0	1	8950
1997	5574	3106	1439	75	5	0	1	10200
1998	5849	2311	1619	9	4	0	1	9793
1999	6778	3174	1424	13	0	0	4	11393
2000	6378	4103	1574	4	7	0	4	12070
2001	6820	4534	1762	5	14	0	5	13140
2002	6940	4680	1785	4	28	0	4	13441
2003	7352	5019	1852	3	40	0	5	14271
2004	7867	5398	2056	4	54	0	6	15385
2005	8138	5132	2010	4	95	0	5	15384
2006	7838	4726	2152	3	120	0	5	14844
2007	8549	4859	2155	3	147	0	4	15717
2008	8788	5283	2112	3	194	0	15	16395
2009	8667	5063	2120	21	236	0	12	16119
2010	9476	4694	2380	12	247	0	18	16827
2011	7995	6169	2553	39	272	24	18	17070
2012	8617	5610	2522	5	292	115	21	17182
2013	12288	6510	2998	60	289	188	21	22354
2014	12333	8259	3158	0	276	279	22	24327
2015	12554	7068	3134	4	264	389	23	23436
2016	13302	7044	3019	14	208	389	29	24005

Source: Malaysia Energy Statistic Handbook 2020

Table 5: Road Transport by Type and Engine Type

Year	Vehicle Type	Petrol	Share (%)	Diesel	Share (%)
2014	Motorcycles	540,341	47.15	45	0.16
	Passenger Cars	591,796	51.64	2,207	7.65
	Busses	-	0.00	122	0.42
	Taxis	1,022	0.09	3	0.01
	Taxi/ Hire Cars	2,199	0.19	14	0.05
	Goods Vehicles	3,810	0.33	9,393	32.56
	Others	6,774	0.59	17,067	59.16
	TOTAL	**1,145,942**	**100**	**28851**	**100**

2015	Motorcycles	464,883	43.24	6	0.03
	Passenger Cars	594,688	55.31	1,712	7.53
	Busses	-	0.00	63	0.28
	Taxis	565	0.05	4	0.02
	Taxi/ Hire Cars	3,486	0.32	6	0.03
	Goods Vehicles	4,015	0.37	7,358	32.36
	Others	7,536	0.70	13,589	59.76
	TOTAL	**1,075,173**	**100**	**22738**	**100**
2016	Motorcycles	464,612	46.52	5	0.03
	Passenger Cars	516,338	51.70	1,242	6.45
	Busses	-	0.00	34	0.18
	Taxis	844	0.08	-	0.00
	Taxi/ Hire Cars	4,306	0.43	3	0.02
	Goods Vehicles	3,675	0.37	6,085	31.58
	Others	9,011	0.90	11,898	61.75
	TOTAL	**998,786**	**100**	**19267**	**100**
2017	Motorcycles	495,198	48.47	4	0.02
	Passenger Cars	506,531	49.58	1,757	8.36
	Busses	-	0.00	17	0.08
	Taxis	484	0.05	-	0.00
	Taxi/ Hire Cars	3,064	0.30	4	0.02
	Goods Vehicles	3,059	0.30	6,339	30.17
	Others	13,268	1.30	12,889	61.35
	TOTAL	**1,021,604**	**100**	**21010**	**100**
2018	Motorcycles	552,035	50.01	4	0.02
	Passenger Cars	528,468	47.87	3,316	13.77
	Busses	-	0.00	5	0.02
	Taxis	542	0.05	-	0.00
	Taxi/ Hire Cars	5,961	0.54	8	0.03
	Goods Vehicles	3,061	0.28	6,967	28.93
	Others	13,872	1.26	13,783	57.23
	TOTAL	**1,103,939**	**100**	**24083**	**100**

Source: Malaysia Energy Statistic Handbook 2020

70% of petrol consumption comes from passenger cars as well as motorcycles. Based on Table 5, reveals that passenger cars lead to a high percentage of usage of petrol which is more than 50% of the total number of vehicles. Meanwhile, in 2018, motorcycles led the consumption of petrol. This is because of the high rise of motorcycles in Malaysia during that year. These two types of vehicles mostly use petroleum products for fuel. For diesel, other vehicle types as well as good vehicles contribute the largest consumption every year. This means that private transportation is the main source of CO2 pollution from road travel. As previously mentioned, the country has seen exponential growth in the number of private cars over the last two decades. It is predicted that it will continue to grow in the coming years. As a result, controlling emissions from private vehicles is the most difficult challenge in Malaysia's transportation sector in terms of reducing GHG emissions.

4. Green Technology Master Plan Malaysia 2017–2030

Ministry of Energy, Green Technology and Water Malaysia (KeTTHA) (2017)published the 'Green Technology Master Plan Malaysia 2017–2040' in June 2017, outlining strategic strategies to build green technology and establish a low-carbon, resource-efficient economy and lay out the country's immediate path for green development. Malaysia's priorities in the power and transportation sectors are outlined in the master plan. The three goals of the power sector are first, to expand renewable energy generation capacity to 25% in 2025 and 30% in 2030, secondly to introduce highly efficient coal-fired power, and to promote cogeneration for more efficient power generation. Lastly to reduce consumption of the residential and commercial sectors by 10% in 2025 and 15% by 2030.

As transportation contributes the highest emission, then this plan also touches on the transport sector's three-pronged approach to reducing CO2 emission. First, to double the modal share of public transport from 20.8% in 2018 to 40% in 2030. Second, to change the ratio of EEVs to private vehicles from 32.6% in 2015 to 100% in 2030. Third, to promote the introduction of eco-friendly fuels such as palm oil.

5. Malaysian Potential in CO2 Reduction

Malaysia's transportation sector is one of the major contributors to the country's greenhouse gas (GHG) emissions. In 2017, the transportation sector accounted for 22% of Malaysia's total GHG emissions, with road transport being the largest contributor. However, Malaysia has the potential to reduce its CO2 emissions from transportation through various initiatives.

One of the key initiatives is the promotion of electric vehicles (EVs) and the development of EV infrastructure. In 2019, the Malaysian government announced a target of having 100,000 EVs on the road by 2030, with plans to increase the number of EV charging stations across the country. In addition, the government has also provided incentives for the purchase of EVs, including exemptions from import duties and sales tax (MIDA, 2019). Transitioning road vehicles from traditional fossil fuels to natural gas can significantly lower CO2 emissions. Natural gas burns cleaner than gasoline or diesel, producing fewer greenhouse gases and pollutants. Encouraging the adoption of NGVs through incentives and supportive policies can contribute to a more sustainable transportation system. Solaymani (2022) suggests providing financial incentives and subsidies for the purchase and use of electric, hybrid, and other low-emission vehicles.

Another initiative is the promotion of public transportation, including the expansion of rail networks and the introduction of bus rapid transit systems. The government has also introduced policies to encourage the use of public transportation, including the implementation of congestion charges and the introduction of a cashless payment system for public transportation. Enhancing public transportation in terms of capacity, coverage, and quality is crucial for reducing reliance on private vehicles. Investments in expanding and improving public transit infrastructure, such as buses, trains, and light rail systems, can make public transport a more attractive option. This, in turn, reduces the number of vehicles on the road, thereby lowering CO2 emissions and easing traffic congestion.

Furthermore, Malaysia has also been exploring the use of alternative fuels, including biofuels and hydrogen fuel cells, for transportation. In 2019, Malaysia's first hydrogen fuel cell electric vehicle was unveiled, with plans to expand the use of hydrogen fuel cell technology in the transportation sector. According to a recent study by Al-Amin & Doberstein (2019), the adoption of hydrogen fuel cell vehicles in Malaysia could result in a significant reduction in CO2 emissions. The study found that the use of hydrogen fuel cell vehicles could result in a reduction of up to 60% in CO2 emissions from the transportation sector in Malaysia by 2050. Biodiesel is a renewable alternative to conventional diesel fuel, capable of reducing CO2 and CO emissions by 62% to 36%. Encouraging the production and use of biodiesel, especially in heavy-duty vehicles and public transport, can substantially decrease the overall carbon footprint of the transportation sector.

In addition, the government can implement taxation and pricing policies aimed at reducing CO2 emissions by making high-emission vehicles and fuels more expensive and promoting low-emission alternatives. This includes higher taxes on the purchase and registration of high-emission vehicles, increased fuel taxes, and congestion charges in urban areas. Low-emission vehicles benefit from tax rebates, exemptions, and subsidies, making them more affordable. These policies encourage consumers to choose cleaner transportation options, generate revenue for environmental initiatives, and directly contribute to reducing CO2 emissions and improving air quality. Proper implementation requires public support, infrastructure development, and consideration of economic impacts.

In conclusion, Malaysia has the potential to make significant contributions to CO2 reduction in transportation through the promotion of EVs and the development of EV infrastructure, the promotion of public transportation, and the exploration of alternative fuels. The adoption of hydrogen fuel cell vehicles, in particular, could result in a significant reduction in CO2 emissions.

Conclusion

In conclusion, addressing CO2 emissions from road transportation in Malaysia is a multifaceted challenge that requires a comprehensive approach. The significant rise in private vehicle use, primarily fueled by economic growth and government policies, has led to increased energy consumption and emissions. The Green Technology Master Plan Malaysia 2017–2040 sets ambitious targets for reducing CO2 emissions by enhancing renewable energy generation, improving energy efficiency, and promoting eco-friendly fuels. Key initiatives include the promotion of electric and hydrogen fuel cell vehicles, expansion of EV infrastructure, and enhancement of public transportation systems. By implementing these measures, Malaysia can significantly reduce its transportation sector's carbon footprint, contributing to a more sustainable and environmentally friendly future.

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Investigating The Factors Influencing Employees' Psychological Capital and Mental Well-Being At Multinational Companies (MNCs) in Beijing

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Abstract: This study utilizes the job demands-resources model to examine the relationship between job resources (like organizational climate, co-worker support, authentic leadership, knowledge diversity, and work-life support practices), burnout, psychological capital, and mental health among employees at multinational companies in Beijing. An online survey was filled out by 173 people, and the data were analyzed with PLS-SEM. The results suggest that authentic leadership and work-life support practices had no impact on psychological capital, whereas a positive work environment, helpful co-workers, and a broad range of expertise did. In addition to having direct effects on mental health, psychological capital also indirectly affects mental health through burnout. This study adds to the current literature by examining the mental well-being of employees working for multinational firms in Beijing.

Keywords: *Mental well-being, Multinational Companies, Knowledge diversity, Burnout, Psychological capital*

1. Introduction and Background

Numerous studies have highlighted the rising prevalence of mental health issues in workplaces globally. In 2017, the World Health Organization (WHO) reported that one in eight people globally had a mental health issue, which increased by almost 25% during the COVID-19 pandemic (World Health Organization, 2022). In China, where anxiety and depression dominate the mental health landscape, over 160 million people are grappling with mental illness (Zhang, 2022). Wu et al. (2021) stated the economic repercussions, including therapy costs and lost productivity due to absenteeism and tardiness, underscore the urgency of addressing mental health concerns in the workplace. Amid this backdrop, multinational corporations (MNCs) in Beijing, characterized by diverse cultural and ethnic workforces, confront significant challenges in fostering employee well-being. Expatriates and local staff from varied backgrounds face communication and collaboration hurdles, potentially exacerbating stress levels. Moreover, the dynamic market environment, driven by technological advancements and heightened consumer expectations, compounds employees' anxiety about job security and performance expectations (Gathercole et al., 2018). In many MNCs, a prevailing culture of working late perpetuates stress and burnout, particularly evident in sectors like banking, where employees grapple with heavy workloads and psychological strain (Naithani, 2021; Wu, 2020). Despite extensive research on mental health in various professions, studies focusing on MNC employees, especially in Beijing, remain scarce. Psychological capital, which encompasses individuals' resources and positive development states, has garnered attention for its role in combating burnout and enhancing performance and well-being.

Psychological capital, as defined by Luthans et al. (2004), is the capacity to overcome challenges and promote personal growth. It enables individuals to see variety as a strength rather than a weakness, aiding in communication and interactions across different cultures. (Youssef-Morgan & Hardy, 2014). However, the specific relevance of psychological capital to employees in Beijing's multinational companies remains uncertain, necessitating further investigation. Therefore, this study intends to identify the factors influencing psychological capital and mental well-being among MNC employees in Beijing while offering recommendations to safeguard their mental health. This research aims to analyze the relationship between workplace dynamics, cultural diversity, and psychological resources, which seeks to inform strategies for promoting employee resilience and fostering supportive organizational cultures. With mental health concerns looming large in contemporary workplaces, particularly in the context of multinational environments characterized by cultural diversity and rapid technological advancements, understanding the determinants of psychological capital becomes imperative for cultivating a thriving workforce.

The paper is divided into different sections. This section outlines the literature review and the formulation of hypotheses for the investigation. Next comes the methodology of the study. Section four contains the study's results. The research is concluded in the final portion.

2. Literature Review

Mental Well-Being: The topic of well-being spans philosophical, psychological, sociological, and healthcare literature (Islam & Amin, 2021). Crisp (2017) suggests that "well-being", "wellness", and "quality of life" are interchangeable terms, encompassing what is essential for an individual. Well-being, broadly defined, represents a favorable state of being (Chari et al., 2018). From a management perspective, Ryan and Deci (2001) define well-being as the highest level of psychological functioning and experience. Approaches to studying well-being include the hedonic, focusing on happiness and contentment, and the eudaimonic, emphasizing self-realization (Islam & Amin, 2021). Well-being comprises multiple dimensions, including mental, physical, emotional, psychological, occupational, and social aspects (Kowalski & Loretta, 2017). Good mental well-being enables individuals to effectively manage life's stresses, work efficiently, and contribute to their communities (Makhbul & Khairuddin, 2014; Simons & Baldwin, 2021; World Health Organization, 2022). Poor mental condition can result in mental disease, burnout, and reduced performance and satisfaction (Harvey et al., 2014). Mental health issues in the workplace have significant global implications for both employees and company performance (Thanem & Elraz, 2022).

Psychological Capital: Psychological capital, which refers to an individual's "positive developmental status" and their ability to overcome life's obstacles, is key to fostering productive and content workers (Luthans & Youssef, 2004). Psychological capital is defined as an individual's positive psychological state, consisting of four key components. Self-efficacy refers to the confidence in one's ability to successfully tackle challenges, while optimism involves a positive outlook on present and future success. Hope is the combination of motivation and strategies to achieve goals, and resilience is the capacity to recover from adversity and grow stronger through difficulties (Sabila & Febriansyah, 2021). Investing in employees' psychological capital can enhance organizational outcomes (Luthans et al., 2007). Early life experiences influence psychological capital, which can be enhanced by education and practical experience (Majumdar & Kumar, 2022). Research by Yuen et al. (2020) has shown that elevated levels of psychological capital are associated with enhanced individual and team performance, leading to overall organizational success. The foundations of psychological capital include optimism, hope, resilience, and self-efficacy as stated by Luthans et al. in 2004. Research by Luthans and Broad (2022) suggests that high psychological capital can bolster workers' confidence in challenging work environments. Self-efficacy pertains to one's confidence in achieving professional goals, while positivity relates to expecting positive results. Resilience refers to the capacity to recover from challenges such as stress and change (Malik & Singh, 2024).

Organizational Climate: Organizational climate, as defined by Schneider et al. (2013), encompasses employees' perceptions of rules, practices, and behaviors within the workplace. In today's competitive and technologically evolving landscape, organizational climate has become a strategic priority (Pomirleanu et al., 2022). Lauchlan (2018) emphasizes the importance of ethical leadership in shaping organizational culture, while Nickolopoulos (2021) stresses the significance of collaboration and relational environments. Bartell Machinery Systems (2018) advocates for fostering creativity within the organizational climate to align with company goals. Qadeer & Jaffery (2014) suggest that a positive organizational climate enhances employees' resilience and self-efficacy. Malik and Garg (2020) emphasize that the organizational environment plays a crucial role in promoting continuous learning and empowerment, which in turn boosts optimism and self-efficacy in employees. Andersen (2001) emphasizes the importance of effective communication in fostering improved relationships, particularly crucial for multinational corporations facing challenges in supervisor-follower communication. Li et al. (2022) propose that the organizational climate has a favorable effect on employees' psychological capital, especially within the maritime sector. However, research on how organizational climate affects psychological capital in multinational firms in Beijing remains limited. Hence, the hypothesis is formulated as follows.
H1: Organizational climate positively impacts employees' psychological capital.

Authentic Leadership: Leadership is essential for establishing a work climate that promotes employee

engagement and well-being (Farrukh et al., 2022; Singh et al., 2019). In multinational organizations, effective leadership is particularly vital due to challenges in supervisor-follower communication (Al-Shammari, 2018). Authentic leadership, characterized by honesty, transparency, and ethics, has emerged as a highly effective leadership philosophy (Banks et al., 2016). Avolio and Luthans (2003) suggest that authentic leadership enhances employee loyalty, and well-being, and fosters a healthy work environment. Four key characteristics define authentic leaders: balanced processing, relational transparency, self-awareness, and internalized moral perspective that can foster personal development among followers, inspiring them to achieve individual and collective goals (Walumbwa et al., 2008). Authentic leadership positively influences employees' optimism, self-efficacy, self-discipline, hope, and resilience (Gardner et al., 2011; Bryan & Vitello-Cicciu, 2022). Several researchers endorse the positive impact of authentic leadership on employees' psychological capital (Li et al., 2022; Niswaty et al., 2021; Adil & Kamal, 2020). Akhtar et al. (2022) suggest that authentic leadership enhances followers' task-related abilities, while Bento and Ribeiro (2013) highlight its role in cultivating positive emotions and emotional resilience in followers. Sarwar et al. (2023) show that authentic leadership has a beneficial effect on psychological capital in the Chinese education industry. The results back the theory that genuine leadership has a favorable impact on employees' psychological capital. Based on the reasons described above, the following hypothesis was formulated.

H2: Authentic leadership positively impacts employees' psychological capital.

Co-Worker Support: Social support, comprising emotional, practical, and informational assistance from one's social network, plays a vital role in managing life challenges (Houston et al., 2015). Social identity theory posits that individuals undergo cognitive processes of social categorization, identification, and comparison to form a group identity (Hogg, 2016). This leads to greater social support, potentially boosting psychological capital (Avanzi, 2015). Studies have consistently shown that increased social support correlates with higher psychological capital (Wang & Xue, 2021; Gu et al., 2021), social support is an important resource that can boost psychological capital. (Peepratoom et al., 2020; Lee et al., 2013). Co-worker support, encompassing emotional, instrumental, and trust-based assistance, is crucial for employees' psychological capital and mental health (Karasek & Theorell, 1990). Particularly in the context of COVID-19, co-worker support becomes increasingly valuable for maintaining a positive psychosocial workplace environment (Sigursteinsdottir & Karlsdottir, 2022). Co-worker support fosters hope, resilience, and optimism, positively influencing psychological capital (Paueksztat, 2017; Li et al., 2022). It fosters open communication and trust within the team, which improves self-efficacy (Choi et al., 2003). Co-worker assistance in global organizations promotes idea-sharing and learning, which enhances creativity (Huang & Liu, 2015). Additionally, assisting colleagues morally alleviates psychological stress associated with uncertainty and demanding tasks (Cao & Zhang, 2020). Thus, the above-mentioned arguments inform the hypothesis as below.

H3: Co-worker support has a positive impact on psychological capital.

Work-Life Support Practices:

In today's business environment, there is an increasing prevalence of working couples, single-parent families, and dependents aged 65 and older (Ronda et al., 2016). Consequently, employees are facing greater challenges in balancing work and home responsibilities, leading to heightened work-home conflicts (Roy et al., 2023). For the younger generation, work-life balance is a critical factor in evaluating job opportunities, as highlighted by a global study involving 2,700 participants from over 100 countries (HBR Ascend Staff, 2019). Employers are, therefore, compelled to implement work-life support practices to help employees manage their professional and personal obligations (Gathercole et al., 2018). These practices typically include flexible work schedules, telecommuting, working from home, dependent care programs, family leave programs, and childcare services (Roy et al., 2023). The implementation of work-life support practices by employers has been shown to positively impact employees' job satisfaction and overall well-being. According to Roy et al. (2023), such practices enhance employee engagement, leading to a greater sense of accomplishment at work. Thompson and Prottas (2005) also identified a positive correlation between work-life support practices and employees' sense of life fulfillment. Additionally, Yu et al. (2020) noted that the sense of family and life fulfillment independently contributes to employees' subjective well-being. When employees achieve satisfaction in both their work and personal lives, they experience increased optimism, resilience, hope, and self-efficacy. Moreover, Wang et al. (2011) found that employees are more committed to organizations that respect and support their work-life balance. Conversely, the need to juggle work and personal responsibilities can lead to high job demands, depleting personal resources and exacerbating emotional exhaustion (Huang et al., 2016).

The hypothesis is therefore developed as follows.
H4: Work-life support practices have a positive impact on psychological capital.

Workforce Knowledge Diversity: Workforce diversity includes surface variety, such as age and gender, and knowledge diversity, which refers to variations in experience, knowledge, and functional background (Webber and Donahue, 2001). Globalization has increased the difficulties organizations face regarding diversity (Van Dijk et al., 2017). Cox and Blake (1991) suggest that diversity enhances innovation and production, however, Cunningham and Sagas (2004) discovered that it had a detrimental effect on employee job engagement and satisfaction. Global workforce diversity management faces unique obstacles across different regions, with varying emphasis on specific diversity dimensions (Kharroubi, 2020). Trade openness and innovation ecosystems are linked to workforce diversity in knowledge-based economies (Soral et al., 2023). The concept of diversity management has evolved, becoming an integral part of human resource management (Seliverstova, 2021). In higher education, workforce diversity data collection practices vary globally, reflecting different national priorities and histories (Wilson et al., 2022). However, recent studies suggest that knowledge diversity positively influences employee well-being compared to surface diversity (Jaiswal & Dyaram, 2020). This fosters efficient communication, lowers societal costs, and develops mutual respect and trust among employees (Jaiswal & Dyaram, 2020). This mutual trust enhances employees' hope, confidence, positive attitudes, and resilience (Jaiswal & Dyaram, 2020). Knowledge diversity has a favorable impact on creativity and innovation in the workplace, as shown by Corrocher and Lenzi (2022). Knowledge diversity can also intensify interpersonal and procedural arguments and promote task-related discussions and information sharing with less resistance (Zellmer-Bruin et al., 2008). The elaboration of information will promote efficient contact and communication while lowering societal costs (van Dijk et al., 2017). Based on the above discussions, the hypothesis is proposed as follows.
H5: Workforce knowledge diversity positively impacts psychological capital.

Psychological Capital and Mental Health: Luthans (2015) found that personnel with elevated levels of psychological capital, such as competence, optimism, hope, and resilience, had enhanced productivity and improved mental well-being. Gupta and Shukla (2018) found that psychological capital significantly contributes to the well-being of working women, while Majumdar & Kumar (2022) concluded that it enhances employee well-being in India. Li et al. (2022) showed a direct link between psychological capital and mental well-being among seafarers. In a multinational company, employees operate in a multicultural environment and tackle challenging tasks (Darawong & Igel, 2012). Psychological capital helps employees manage stress (Newman et al., 2014) and perceive workplace diversity as an opportunity rather than a challenge, promoting interaction with diverse peers (Youssef-Morgan and Hardy, 2014). Basinska and Rozkwitalska (2022) found that psychological capital positively correlates with learning and satisfaction with cross-cultural relationships. Additionally, it enhances vitality and positivity within multinational corporations. This leads to the hypothesis stated below.
H6: Psychological capital positively impacts mental well-being.

Psychological Capital and Burnout: The job demands-resources model elucidates the development of burnout due to stress and imbalance as proposed by Demerouti et al. (2001) and Maslach and Leiter (2016). Intensive job requirements, necessitating continual physical, emotional, or cognitive exertion, have been consistently associated with burnout (Demerouti et al., 2001). Coping with burnout necessitates positive physical and psychological resources (Bitmis & Ergeneli, 2015). For instance, resilient individuals perceive workplace challenges as less daunting, requiring fewer resources to combat emotional exhaustion (Ventura et al., 2015). Similarly, hopeful individuals remain motivated by their goals, persevering without experiencing diminished achievement (Li et al., 2022). Students with greater psychological capital exhibit lower burnout risk and greater optimism regarding their goals (Chang et al., 2000; Barratt & Duran, 2021). Optimistic seafarers, possessing abundant resources, are better equipped to cope with burnout (Chapman & Chi, 2017). Considering the above discussion, the following hypothesis is suggested.
H7: Psychological capital hurts burnout.

Burnout and Mental Well-being: Burnout in the workplace occurs when job expectations surpass available resources, like a heavy workload, role conflict, poor autonomy, and insufficient social support (Edú-Valsania et al., 2022; Wan et al., 2023). Burnout has a significant impact on the mental well-being of an individual and

the company's performance (White et al., 2019; Bakker et al., 2014). As Pluut et al. (2018) point out, burnout often causes tension, anxiety, and upset. Burnout may lead to serious health problems such as depression (Ahola & Hakanenm 2007), sleep disturbances (Umehara et al., 2007) and chronic back pain (Mat Rifin & Danaee, 2022). Burnout may lead to serious health problems. To support physical and mental health, it is important to prevent burnout and intervene when it occurs (Wen et al., 2023). This will negatively impact mental well-being. Hence, this hypothesis is proposed.
H8: Staff burnout hurts employees' mental well-being.

Mediating Effect of Burnout: This study views burnout as a mediator in the relationship between psychological capital and employee mental well-being. The job demands-resources model highlights how positive psychological capital can improve employees' mental well-being and prevent burnout. Manzano-Garcia and Ayala (2017) found that positive psychological capital reduces burnout and increases psychological well-being in autism care providers. Lupșa and Vîrgă (2020) found that burnout acts as a mediator in the connection between psychological capital and health. Li et al. (2022) discovered that burnout acts as a mediator in the connection between psychological capital and the mental well-being of seafarers. Thus, the subsequent hypothesis can be formulated.
H9: Burnout mediates the relationship between psychological capital and mental well-being.

3. Research Methodology

Research design: This study employs a quantitative way to evaluate the framework and hypotheses. A Chinese online survey tool called Wenjuanxing is used to create and publish survey questionnaires. Questionnaires are shared via social networks like WeChat and Weibo, as well as through email. SPSS and SmartPLS statistical analysis software are utilized for analyzing the data obtained from the survey questionnaire.

Development of Survey Instrument: This study assesses organizational climate, authentic leadership, co-worker support, work-life support practices, workforce knowledge diversity, employee psychological capital, burnout, and mental well-being by drawing on various sources including Rogg et al. (2001), Neider and Schriesheim (2011), and Maslach et al. (2016). 46 measurement items were generated for the 8 latent components. In other words, the instrument was adapted from multiple sources to align with the study's objectives. The items were translated into Chinese to ensure more precise responses. For validation purposes, six specialists assessed the substance, clarity of phrasing, and statements of the items. The study employs a seven-point Likert scale ranging from 1 for strongly disagree or never to 7 for strongly agree or always (Krosnick & Presser, 2010). Validity testing, including content validity through expert reviews and construct validity via CFA in SmartPLS-SEM, was thoroughly conducted, ensuring the reliability and accuracy of the measurement model. The measurement model in this study comprises reflective constructs. Each indicator reflects the underlying latent variable and high internal consistency among indicators is expected. The analysis focuses on evaluating the reliability and validity of these reflective constructs. All reflective constructs showed satisfactory factor loadings above 0.70, Composite Reliability (CR) values above 0.70, and AVE values above 0.50, indicating good convergent validity (Hair et al., 2017; Gefen & Straub, 2005). Discriminant validity (Henseler, Ringle & Sarstedt, 2015) was confirmed using the Fornell-Larcker criterion (Fornell & Larcker, 1981) and Heterotrait-Monotrait Ratio (HTMT) (Gold et al. (2001).

Sampling Method and Respondents: Respondents are employees of multinational companies in Beijing. There are more than 20,000 MNCs listed in LexisNexis's Directory of Corporate Affiliations, with a revenue threshold of $50 million. The number of MNCs with headquarters in Beijing in 2016 was 926, including domestic parent companies and foreign regional headquarters (Wang et al., 2021). This study adopts a convenience sampling method. The online questionnaires were sent to relatives, previous colleagues and friends working at multinational companies in Beijing and asked them to distribute to their friends who fit the criteria for the target group. PLS-SEM analysis requires 147 samples to achieve a 0.05 significance level and 0.1 R^2, with a maximum of 5 arrows pointing at a construct. In total, 173 valid responses were collected. Therefore, this sample is sufficient for performing PLS-SEM. Table 1 displays the demographic characteristics of the respondents. The study is based on the job demands-resources model, known for its effectiveness in predicting employee job performance and well-being (Bakker & Demerouti, 2006). This idea explains that stress arises from disparities between the requirements of a work and the resources accessible to manage them. Job

demands refer to the physical and/or psychological efforts needed for a job, whereas resources help reduce these demands, promoting personal development and achieving goals. This study explores job resources including organizational climate, authentic leadership, co-worker support, knowledge diversity, and work-life support practices (see Figure 1).

Figure 1: Theoretical Framework

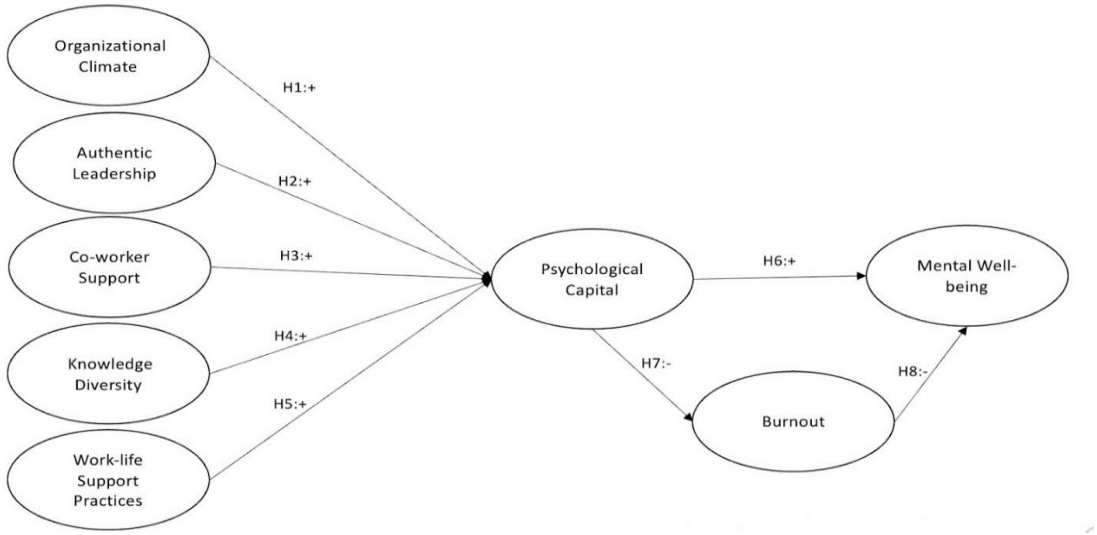


Table 1: Respondents' Demographics

Category	Sub-Category	Frequency (n=173)	Percentage (%)
Gender	Male	67	38.7
	Female	106	61.3
Age	＜30	13	7.5
	31-40	73	42.2
	41-50	72	41.6
	>50	15	8.7
Education Qualification	Diploma	15	8.7
	Bachelor	85	49.1
	Master	73	42.2
Education Background	Business	8	4.6
	Engineering	40	23.1
	Education	8	4.6
	Management	37	21.4
	Computer and Information Sciences	22	12.7
	Accounting & Finance	38	22.0
	Others	20	11.6
Working Experience	＜5 years	9	5.2
	>20 years	43	24.9
	11-15 years	50	28.9
	16-20 years	49	28.3
	5-11 years	22	12.7
Tenure	＜5 years	48	27.7
	>20 years	13	7.5
	11-15 years	41	23.7
	16-20 years	21	12.1
	5-11 years	50	28.9
	Middle management	77	44.5

Job Category	Action-oriented/execution roles	86	49.7
	Top management	10	5.8
Domain	Technical	50	28.9
	non-technical	123	71.1
Department	General Management	16	9.2
	Business Development	14	8.1
	Human Resource	11	6.4
	IT	24	13.9
	Audit Risk & Compliance	10	5.8
	Marketing	13	7.5
	Operations & Logistics	4	2.3
	Research and Development	12	6.9
	Accounting & Finance	20	11.6
	Sales	34	19.7
	Training	6	3.5
	Others	9	5.2
Industry	IT, Internet, Software & Services	11	6.4
	Semiconductors, Electronics, Electrical, Engineering, Hardware& Telecommunications Services	7	4.0
	Engineering	6	3.5
	Automotive	94	54.3
	Banking and Financial Services	41	23.7
	Others	14	8.1
Headquarter Country	China	82	47.4
	Germany	62	35.8
	USA	12	6.9
	UK	9	5.2
	Others	8	4.6

4. Results

Table 2 displays indicator reliability, with factor loadings above 0.7 considered acceptable. Items falling between 0.4 and 0.7 were evaluated, but no removal was warranted as it did not impact AVE and CR. Despite some loadings between 0.5 and 0.7, all items were retained for consistency. The internal consistency, evaluated by Cronbach's alpha and Composite Reliability (CR), ranged from 0.865 to 0.93 and 0.905 to 0.947, respectively, meeting reliability criteria (Nunnally, 1994). Discriminant validity was established by meeting the Fornell-Larcker and HTMT criteria. The Fornell-Larcker analysis showed that the square root of Average Variance Extracted (AVE) was higher than the correlations, and HTMT ratios below 0.9 suggested significant discriminant validity (Henseler et al., 2015). Tables 3, 4 and 5 illustrate satisfactory outcomes for both criteria, ensuring discriminant validity.

Table 2: Measurement Model Evaluation

Constructs	Items	Loadings	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Organizational Climate	OC1	0.851	0.865	0.873	0.908	0.713
	OC2	0.78				
	OC3	0.851				
	OC4	0.917				
	OC5	0.878				
	OC6	0.887				

Authentic Leadership	AL1	0.869	0.873	0.875	0.898	0.529
	AL2	0.758				
	AL3	0.852				
	AL4	0.892				
Co-worker Support	CS1	0.893	0.929	0.936	0.947	0.781
	CS2	0.906				
	CS3	0.909				
	CS4	0.896				
	CS5	0.81				
Work-life Support Practices	WLSP 1	0.848	0.877	0.898	0.905	0.613
	WLSP 2	0.83				
	WLSP 3	0.829				
	WLSP 4	0.904				
	WLSP 5	0.838				
	WLSP 6	0.761				
Knowledge Diversity	KD1	0.709	0.93	0.935	0.945	0.742
	KD2	0.74				
	KD3	0.825				
	KD4	0.815				
	KD5	0.811				
	KD6	0.791				
Psychological Capital	PC1	0.847	0.893	0.897	0.926	0.757
	PC2	0.862				
	PC3	0.881				
	PC4	0.891				
Burnout	BU1	0.733	0.9	0.904	0.921	0.627
	BU2	0.661				
	BU3	0.809				
	BU4	0.773				
	BU5	0.816				
	BU6	0.777				
	BU7	0.648				
	BU8	0.56				
Mental	WB1	0.778	0.913	0.92	0.933	0.699
	WB2	0.846				
	WB3	0.673				
	WB4	0.87				

Well-being	WB5	0.821
	WB6	0.752
	WB7	0.788

Table 3: Discriminant Validity (Fornell-Larcker Criterion)

	AL	BU	CS	KD	OC	PC	WB	WLSP
AL	**0.844**							
BU	-0.408	**0.727**						
CS	0.629	-0.436	**0.883**					
KD	0.348	-0.258	0.287	**0.783**				
OC	0.793	-0.526	0.719	0.339	**0.862**			
PC	0.615	-0.557	0.649	0.38	0.685	**0.87**		
WB	0.506	-0.623	0.576	0.283	0.623	0.679	**0.792**	
WLSP	0.498	-0.427	0.553	0.478	0.577	0.471	0.47	**0.836**

Table 4: Discriminant Validity (Heterotrait-Monotrait Ratio, HTMT)

	AL	BU	CS	KD	OC	PC	WB	WLSP
AL								
BU	0.437							
CS	0.695	0.456						
KD	0.368	0.27	0.29					
OC	0.875	0.543	0.774	0.346				
PC	0.696	0.588	0.707	0.411	0.744			
WB	0.57	0.663	0.628	0.315	0.677	0.748		
WLSP	0.557	0.454	0.6	0.517	0.626	0.513	0.522	

Table 5: The Inner VIF Values

Variable	VIF
AL	2.794
BU	1.452
CS	2.238
KD	1.327
OC	3.604
PC	1.452
WLSP	1.836

Structural Model Results: Analysis of the structural model showed that 6 out of 8 hypotheses were statistically significant at the 0.05 and 0.01 levels, as indicated in Table 6. Organizational climate (β = 0.337), co-worker support (β = 0.303), and knowledge diversity (β = 0.147) positively influenced psychological capital, supporting H1, H3, and H4 respectively. Moreover, psychological capital positively impacted employees' mental well-being (β = 0.483), while negatively affecting burnout (β = -0.558), corroborating H6 and H7. Additionally, burnout negatively affected mental well-being (β = -0.353), supporting H8. However, authentic leadership (β = 0.115) and work-life support practices (β = -0.018) did not significantly influence psychological capital and mental well-being, rejecting H2 and H5. Burnout mediated the relationship between psychological capital and mental well-being in a significant way (β = 0.197). R2 values indicated that psychological capital and mental well-being accounted for 54.9% of variations in mental well-being. Q2 values revealed high predictive relevance for psychological capital, moderate for mental well-being, and low for burnout. Effect sizes showed large effects of psychological capital on mental well-being (f2 = 0.357) and burnout (f2 = 0.452), with smaller effects for organizational climate, co-worker support, and knowledge diversity on psychological capital. Authentic leadership and work-life support practices had minimal effects on mental well-being (see Table 7).

Table 6: Path Coefficient, T-Statistics and Significance Level Hypothesized Paths

Hypothesis	Relationship	Path coefficients	T statistics (|O/STDEV|)	P values	Decision
H1	OC -> PC	0.337	2.934	0.00	Supported
H2	AL -> PC	0.115	1.185	0.24	Not supported
H3	CS -> PC	0.303	3.31	0.00	Supported
H4	KD -> PC	0.147	2.236	0.03	Supported
H5	WLSP -> PC	-0.018	0.251	0.80	Not supported
H6	PC -> WB	0.483	6.384	0.00	Supported
H7	PC -> BU	-0.558	14.173	0.00	Supported
H8	BU -> WB	-0.353	6.164	0.00	Supported
H9	PC -> BU -> WB	0.197	5.174	0.000	Supported

Table 7: The results of R^2, Q^2, f^2

Endogenous Construct	R^2	Q^2	Path	f^2	Effect Size
Psychological capital	0.545>0.5	0.398>0.35	Organizational climate -> Psychological capital	0.069	Small Effects
			Authentic leadership -> Psychological capital	0.01	No Effects
			Co-worker support -> Psychological capital	0.09	Small Effects
			Knowledge diversity -> Psychological capital	0.036	Small Effects
			Work-life support practices -> Psychological capital	<0.001	No Effects
Burnout	0.311>0.25	0.14>0.02	Psychological capital -> Burnout	0.452	Large Effects
Mental well-being	0.549>0.5	0.336>0.15	Psychological capital -> Mental well-being	0.357	Large Effects
			Burnout -> Mental well-being	0.19	Medium Effects

Note: f^2 < 0.02: No Effects; f2 > 0.02: Small Effects; f2 > 0.15: Medium Effects; f2 > 0.35: Large Effects

Discussion

The study uncovers important connections between many elements concerning job resources and employees' psychological capital. Organizational climate demonstrates the strongest association with psychological capital ($\beta = 0.337$, $p < 0.01$). This finding aligns with Mulki and Lassk (2019), who argue that a supportive work environment is essential for mitigating the adverse effects faced by employees, particularly in multinational settings where cultural and operational complexities are heightened. A positive organizational climate fosters a sense of security, belonging, and support, which are crucial in enhancing employees' psychological capital. This is particularly important in multinational corporations where the organizational environment must accommodate diverse cultural backgrounds, thus amplifying the need for a climate that is both inclusive and supportive. Following closely, support from coworkers also significantly impacts psychological capital ($\beta = 0.303$, $p < 0.01$). This result corroborates the findings of Peepratoom et al. (2020) and Lee et al. (2013), who highlight the importance of social support in resource development, especially for employees dealing with cross-cultural obstacles. In workplaces where cross-cultural interactions are frequent, the support of coworkers becomes a vital resource that helps employees navigate challenges, build confidence, and enhance their psychological capital. This peer support not only provides emotional sustenance but also fosters knowledge-sharing and collaborative problem-solving, which are essential for personal and professional

growth in diverse environments. While the relationship between knowledge variety and psychological capital is less pronounced ($\beta = 0.147$, $p < 0.05$), its significance should not be underestimated. Knowledge variety contributes to fostering inclusivity and a sense of connection among employees, particularly in diverse teams where the exchange of varied perspectives can lead to innovative solutions and a richer workplace experience.

Shore et al. (2011) and Jaiswal and Dyaram (2020) emphasize that diversity management when effectively implemented, can enhance psychological capital by promoting an environment where different viewpoints are valued and integrated into decision-making processes. In this context, knowledge variety plays a key role in cultivating an inclusive culture that supports the development of psychological resources among employees. Contrary to expectations, authentic leadership ($\beta = 0.115$, $p = 0.236$) and work-life support practices ($\beta = -0.018$, $p = 0.802$) show negligible effects on psychological capital. These findings suggest that in multinational corporations, the influence of leadership and work-life balance initiatives on psychological capital may be diminished by the hierarchical management structures and cultural influences prevalent in such organizations. Authentic leadership, typically characterized by transparency, ethics, and a focus on employee development, may not have the desired impact in environments where rigid hierarchies and cultural norms limit the expression and reception of leadership behaviors. Similarly, work-life support practices may be perceived as less relevant or effective in settings where work demands and cultural expectations around work-life balance differ significantly from one region to another.

The study also finds a strong correlation between psychological capital and mental well-being ($\beta = 0.483$, $p < 0.01$), reinforcing the notion that employees with higher levels of psychological capital are better equipped to maintain good mental health. This supports Luthans' (2015) assertion that psychological capital—comprising hope, efficacy, resilience, and optimism—serves as a robust foundation for mental well-being, enabling employees to cope more effectively with stress and adversity. The significant role of psychological capital in mitigating stress ($\beta = -0.558$, $p < 0.01$) further underscores its importance as a buffer against burnout. This finding aligns with Bitmis and Ergeneli (2015), who argue that psychological resources are crucial in combating the detrimental effects of work-related stress, particularly in high-pressure environments such as multinational corporations. Burnout, in turn, slightly worsens mental health ($\beta = -0.353$, $p < 0.01$), acting as a mediator between psychological capital and mental well-being ($\beta = -0.353$, $p < 0.01$). The result is aligned with previous studies of Manzano-García and Ayala (2017) and Li et al. (2022), who explore the complex interplay between psychological capital, burnout, and mental health. Their research indicates that while psychological capital can reduce the likelihood of burnout, the presence of burnout can, in turn, diminish the positive impact of psychological capital on mental health. Therefore, interventions aimed at enhancing psychological capital should also address factors that contribute to burnout, ensuring a comprehensive approach to improving employee well-being. In a nutshell, this study contributes to a deeper understanding of the intricate relationships between job resources and psychological capital, offering valuable insights for organizations, particularly those operating in multicultural and multinational contexts. By highlighting the central role of organizational climate and coworker support, the research underscores the importance of creating a supportive and inclusive work environment that fosters the development of psychological resources, ultimately leading to better mental health outcomes for employees.

5. Managerial Implications and Recommendations

The results of the structural equation analysis in this study reveal important connections among many factors in the setting of multinational corporations (MNCs) in Beijing. Firstly, the work environment significantly influences employees' psychological capital, accentuating the need to cultivate a positive and supportive workplace to address the challenges present in multinational corporation settings. Secondly, social support from coworkers emerges as another significant factor influencing psychological capital, highlighting the importance of cultivating strong interpersonal relationships within diverse teams. Additionally, while knowledge variety doesn't exhibit a strong direct link with psychological capital, it remains crucial for promoting inclusivity and a sense of belonging within MNCs, emphasizing the need for robust diversity management policies. However, the study suggests that traditional notions of leadership in MNCs may not significantly impact psychological capital, possibly due to entrenched hierarchical structures. Surprisingly, work-life support practices show no significant effect on psychological capital, suggesting that employees prioritize professional growth over personal pursuits in the competitive landscape of Beijing's MNCs. The study

highlights the significant influence of psychological capital on mental health and stress reduction, emphasizing its importance as a vital resource in dealing with the demands of the corporate setting, especially in addressing burnout. The results highlight the complex elements that affect psychological well-being in multinational corporations, emphasizing the significance of fostering supportive organizational cultures and utilizing resources to improve employee resilience and mental health.

Conclusion

There are multiple constraints on this study. The data analysis result may be biased due to the use of convenience sampling in this study, which is a self-administered sampling approach. The findings must be comprehensively understood and widely utilized as a result. Only 173 replies were collected due to time constraints. Increasing the number of responses will enhance the representativeness of the target group and improve the accuracy of the results. Lastly, in addition to the five components mentioned in the research review that directly affect psychological capital, other variables including employees' personalities, traits, and autonomy may also influence psychological capital and mental well-being. This study indicates that authentic leadership does not have a substantial impact on employees' psychological capital and mental well-being. Therefore, other leadership styles, such as transformational leadership, should be taken into account when assessing the influence on psychological capital. Finally, it is advised to research MNCs in other nations or different categories of organizations.

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The Impact of Government Expenditure on Economic Growth in Malaysia

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Abstract: This study experimentally investigates the relationship between economic growth and government spending in Malaysia from 1990 to 2022 using time series data. The study analyzes the impact of total government spending on economic growth, covering housing, healthcare, social services, military, and education while identifying which sector has the most effect on economic growth. The Autoregressive Distributed Lag (ARDL) method is employed to evaluate the effects of these expenditures. The findings demonstrate that, in the short run, all variables significantly affect economic growth, hence refuting the null hypothesis. However, only trade openness and labor spending positively impact long-term economic growth. Research indicates that housing and education expenditures are the primary long-term drivers of economic growth in Malaysia. The data suggest that the Malaysian economy contradicts the Keynesian theory, as less government spending appears to improve the real GDP growth rate. The inverse relationship between government spending and economic growth indicates that government expenditure may not be the primary catalyst for economic growth, hence supporting Wagner's law. These findings provide policymakers with essential insights for optimizing government spending to improve economic development results.
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Keywords: *Economic growth, ARDL, government expenditures, Keynesian, total expenditure*

1. Introduction and Background

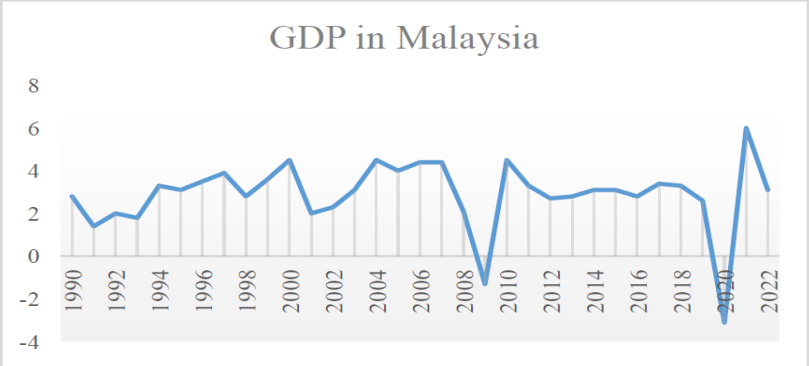
Economic growth is fundamental to the prosperity of nations, characterized by an increase in the productive capacity of the economy, which in turn raises national output and income over time. Smith (2003) defines economic growth as the venture where the increasing level of production of the economy is realized over time to produce higher national income and output. This definition underscores the importance of GDP growth rates as key indicators of economic health.

Government expenditures are often considered an important indication for promoting and maintaining expansion in the economy. In recent decades, a growing number of economists and policymakers have expressed interest in the correlation between government expenditure and economic growth. Odo et al. (2016) highlighted the importance of government expenditure as an essential instrument for maintaining substantial economic growth rates. Government expenditure is an essential factor in facilitating economic recovery. Hasnul (2015) emphasizes that government expenditure significantly influences economic activity and the achievement of policy objectives. Among the others, Abdullah et al. (2016) further examine the positive correlation between government expenditure and economic growth, positing that government expenditure serves as an essential variable in promoting economic progress.

In Malaysia, government expenditure is a crucial factor that affects economic activity and policy objectives. Kannan et al. (2014) assert that government expenditure is essential for economic recovery, especially during periods of economic hardship. This is also supported by Ahuja & Pandit (2020) where increasing government expenditure is important for maintaining and achieving high levels of economic growth, as it can help stabilize the economy and foster development. Figure 1 illustrates the changes in Malaysia's gross domestic product growth from 1990 to 2022. Between 1990 and 2022, Malaysia's gross domestic product (GDP) exhibited substantial fluctuations, notably observing a significant decline from 7.3 in 1997 to -7.4 in 1998. The Gross Domestic Product (GDP) exhibits a significant fall from 2019 to 2020, shifting from an upward trend of 4.4 to a decline of -5.5, followed by another climb until 2022. This demonstrates that Malaysia persists in addressing external developmental challenges and risks associated with a more liberal economic framework, despite the substantial efforts conducted in macroeconomic governance. (Kamis et al., 2020). As we can see in Figure 1, Malaysia has been experiencing a fluctuating trend of economic growth despite the substantial government

efforts in macroeconomic management over the past 5 years, however, the economic growth is inconsistent. The study focuses on the significance of government expenditure on economic growth in Malaysia. The main objective of this article is to assess the impact of government expenditure on economic growth in Malaysia, employing data from 1990 to 2023. This research seeks to explain the impact of various government expenditures on GDP in promoting economic stability and development. Various categories of government spending—such as housing, healthcare, social services, defense, and education are employed to reaffirm the effectiveness of each government effectiveness on economic growth. This analysis is particularly important given the mixed results found in existing literature, where some studies indicate positive correlations between government spending and economic growth, while others suggest negative or insignificant effects.

Figure 1: Malaysia's GDP growth (annual %)



Source: World Bank Data

This study employed various indices of government spending on economic development. Uwatt's (2019) study highlights the important role of the housing sector in economic growth and development. The industry significantly impacts a nation's social and economic advancement. The research emphasized the crucial role of both government and private sectors in promoting sustainable growth and improving economic output through the development of high-quality housing. Moreover, IMF, (2023) stated that with the help of numerous initiatives, the housing sector's recovery can boost the economy and lead to general growth. In the context of government spending, "housing expenditure" usually refers to the money allotted or spent by the government on housing-related projects, programs, or subsidies. The purpose of government housing spending is to meet the population's housing needs, promote affordable housing, and address several housing sector issues.

In terms of healthcare, the study by Bloom et al., (2004) states that health is important to promote economic growth. Employees in better physical and mental health are more energetic and persistent. They produce more and make more money. According to the Ministry of Health, in 2019, Malaysia's GDP was 4.3% of its total health expenditure (TEH). A healthier workforce, higher productivity, and better health outcomes are frequently linked to higher healthcare spending, all of which can support economic growth. Spending more on healthcare is frequently linked to better health outcomes, higher productivity, and a healthier workforce which may contribute to economic expansion. (Bloom and Canning, 2003) For social expenditure, the study from (Alper & Demiral, 2016) concludes that social expenditures in all three dimensions can contribute substantially to economic expansion. The overall findings highlight the fact that, in the case of certain OECD countries, public spending can be profitable as an investment. The term "healthcare expenditure" refers to the money that the government sets aside or spends on infrastructure, services, and programs related to healthcare. The goal of this spending is to keep and enhance the population's health and well-being. The amount of money allocated by the government to healthcare varies depending on the priorities, policies, and healthcare system of the nation.

This study by Aziz & Asadullah(2017), found that the effect of military spending on growth in case of internal conflicts is positive and significant but, it is not confirmed when external conflicts exist. Farther than that, however, even though the studies directly targeting defense spending and national security in Malaysia are lacking, the government usually finances the national defense expenditure which is important for the growth

of the economy because of its impact on national security, stability and critical infrastructure protection. (Kamis et al., 2020)

For education expenditure, the study from Abdul Latif et al., (2007) suggests that there is a co-integrating relationship between GDP per capita and education as measured by primary, secondary, and higher education enrolment rates. Next, a study from Hussin et al., (2012) demonstrates the significance of human capital, such as education, in influencing Malaysia's economic growth. Based on the above existing literature, this study examines the impact of government expenditure by focusing on the above-mentioned five sectors including housing, healthcare, social, defense security, education expenditure, capital expenditure, trade openness and labor expenditure.

Next, in terms of capital expenditure, according to reports, one of the most important components of public spending for a nation's comprehensive and long-term economic growth is capital spending. Nevertheless, it is a difficult undertaking to manage capital expenditures, expenses, and distribution in an equitable way to achieve economic growth in each fiscal year. (Al-Sharif, 2019). Based on the above-mentioned studies, the paper will further investigate the role of government expenditure on economic growth by focusing on how various categories of government spending—such as housing, healthcare, social services, defense, and education-impact economic growth. Hence, the second objective of the paper.

The remaining of the study is organized into five sections. In section two, the paper addresses the existing theoretical and empirical literature on various government expenditures on economic growth; section three introduces estimation technique and methodology, section four shows the empirical research analysis and section five concludes the study and recommendations.

2. Literature Review

The relationship between government spending and economic growth has been a commonly examined subject in economic studies. Wagner's Law and Keynesian Theory influence the relationship by providing various perspectives on the function of government expenditure. Wagner’s Theory posits that as an economy grows, government expenditure increases, whereas economic growth leads to higher public spending due to increased demand for public services and infrastructure. According to this theory, as the economy evolves, the government's activities and functions tend to expand. Consequently, the proportion of public spending relative to national income typically rises during economic development (Magazzino et al. 2015). Economic growth, or GDP, refers to the increases in an economy's productive capacity, leading to the creation of a significantly greater quantity of goods and services. Several studies support Wagner’s hypothesis, showing a positive correlation between economic growth and government spending. For instance, Wu et al. (2010) found a bidirectional causal relationship between government expenditure and economic growth regardless of the perspective on the size of the government using data from 182 countries. In a similar study by Uzuner et al. (2017), the long-term correlation between public spending and economic growth is found in Turkey, supporting Wagner’s law with Johansen's cointegration test and Granger's causality test for the period from 1975 to 2014.

Keynes (1936) argued in his book "General Theory of Employment, Interest, and Money" that governments must step in during economic downturns to boost aggregate demand as a short-term remedy. As Government spending is one of the determinants of aggregate demand, any upward movement of it leads to the multiplier that increases output and employment. Keynes argued that government spending is fiscal policy and is a mechanism for affecting the economy. As a result, he asserted that public spending was exogenous. This is consistent with an Italian study by Magazzino et al., (2015), who supports the Keynesian theory of government expenditure. Additionally, the research conducted in Nigeria by Ayo et al. (2011) demonstrates a two-way causal relationship between government expenditures and economic growth that operates in both the short- and long-term. Among the others, Jiranyakul (2020) and Babatunde (2011) for Nigeria. By using Granger's causality test and conducting a cross-country investigation in five Asian nations, Wu et al., (2010) discovered a Keynesian connection only in the Philippines case.

The empirical findings on the correlation between government spending and economic growth cover various sectors including housing, healthcare, social services, defense, education, capital, trade openness, and labor. In the early stages of development, governments in countries like China and South Korea often discouraged housing investments, believing that they yielded lower returns compared to manufacturing and infrastructure sectors. However, more recent studies highlight the significant role of housing in economic growth. Housing investments contribute to job creation, income generation, and overall economic development. For example, Uwatt (2019) noted that improved housing can enhance productivity in other economic areas. Andrews et al. (2011) further emphasized the need for better housing policies to promote economic growth, advocating for targeted social housing systems and flexible housing allowances.

The World Health Organization (WHO) asserts that healthcare spending is a significant component of national budgets, offering substantial opportunities to impact national economies. Health is both a desirable outcome and a key determinant of economic productivity. Grossman (2004) described health as a commodity that individuals both produce and consume. Healthier populations are more productive, which boosts economic growth. Studies in East Africa (Gisore, 2020) and Malaysia (Kamis et al., 2020) have found positive correlations between healthcare expenditure and economic growth. However, some studies, like those by Hasnul (2015) and Velenyi (2016), suggest a complex relationship between health spending on economic growth, indicating the health channel is country-specific, and the effects on economic growth may vary by context.

Among the others, Alam et al. (2010) examined the long-term effects of social sector spending on economic growth in developing Asian nations, finding positive impacts. Social sector spending, including on health, nutrition, housing, education, and social security, is generally seen as beneficial for the economy. Social expenditures also improve employment opportunities, income levels, and productivity, which in turn foster economic growth. The positive and long-run relationship between social expenditures and economic growth is also supported by Ayuba & Ayuba (2014). Ayuba & Ayuba (2014) used Vector Error Correction (VEC) model-based causality to examine the impact of social expenditures and economic growth in Nigeria between 1990 to 2009.

The relationship between defense spending and economic growth is complex and contentious. Benoit (1978) found that defense expenditures had a positive impact on economic growth in less developed countries, a finding known as the "Benoit Hypothesis." However, more recent studies present mixed results. Yildirim & Ocal (2016) observed a positive effect of military spending on economic growth in Middle Eastern countries, while Braşoveanu (2010) found that defense spending negatively affected economic growth in Romania.

Investment in education is crucial for developing human capital, which is a key driver of economic growth. Studies in developing countries (Idrees & Siddiqi, 2013) and Malaysia (Hussin et al, 2012) found that education spending positively correlates with GDP growth. The quality of education is capable of increasing a country's economic growth. However, some existing studies (Suwandaru et al, 2021) argue that the relationship between education and economic growth is not always straightforward, suggesting that other factors may influence this relationship in Indonesia.

Government capital expenditure on infrastructure and other investment goods is essential for economic growth. Empirical research by Waweru (2021) confirmed the positive relationship between government capital expenditure and economic growth in East Africa by using the panel least square (OLS) method. Nonetheless, some studies, like those by Paudel (2023), question the assumption that all capital expenditures equally contribute to growth, indicating that the effectiveness of such investments can vary.

Overall, the theoretical examination emphasizes Wagner and Keynes's views as the most significant theories for comprehending the relationship between government expenditure and economic growth. Keynesian theory emphasizes the use of fiscal policies, including increased government expenditure, to stimulate economic activity during recessions. In summary, the existing theoretical and empirical literature provides a comprehensive foundation for examining the impact of different types of government expenditures on economic growth across different countries. While some studies support a positive relationship between government expenditure and economic growth, others indicate insignificant effects.

3. Research Methodology

This study focuses on the impact of government expenditure on economic growth in Malaysia from 1990-2022. The data are sourced from the World Bank and include GDP per capita, and expenditures on housing, healthcare, social services, defense, education, capital, trade openness, and labor participation. The measurements for each variable are summarized in Table 1.

Table 1: Variable's definition and proxies' measurement

Variables	Proxies	Explanation
GDP	Gross domestic product used to measure economic growth in Malaysia	GDP per capita at local currency unit (LCU)
EXP	The total government expenditure in different sectors includes housing expenditure, healthcare expenditure, social expenditure, defense expenditure, and education expenditure.	All the government expenditure is in Ringgit Malaysia (RM)
C	Gross capital fixed as a proxy to measure capital in Malaysia	Constant local currency unit (LCU)
OPEN	Trade Openness	Constant local currency unit (LCU)
LB	Labor	Labor force, total

We employed a time series analysis to examine data made up of evaluations of the values of variables at various points in time. The model is employed to comprehend the basic components and strengths of the observed data.

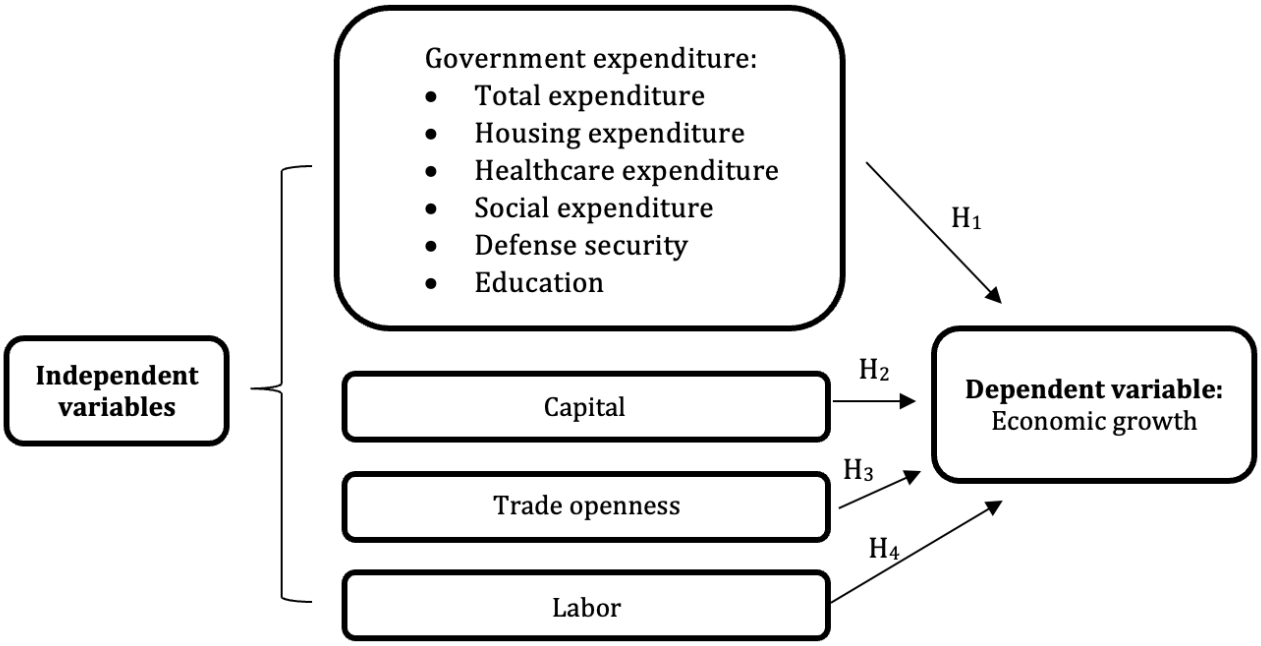
EQ(1) below is the model specification:

$$GDP_t = \beta_0 + \beta_1 EXP_t + \beta_2 C_t + \beta_3 OPEN_t + \beta_4 LB_t + \varepsilon_t$$

Where
GDP = economic growth
EXP = government expenditure
C = capital
OPEN = trade openness
LB = labor
ε = error term

Trade openness and labor force participation are added into the model specification as a vital catalyst for economic growth, enhancing market access and resource allocation. Studies by Huang and Chang (2014) and Tahir and Azid (2015) found positive correlations between trade openness and economic growth. Wong (2005) also highlighted the significant impact of trade openness on Malaysia's economic growth. Studies in Indonesia by Nadilla and Ichsan (2023) show that higher labor force participation rates positively impact GDP. The quality and availability of labor are crucial for sustaining economic development, as highlighted by Jajri and Ismail (2010).

Figure 2: Theoretical Framework



From the theoretical framework in Figure 2, we expect that the Malaysian economy will adhere to the endogenous growth theory and the Keynesian hypothesis, which contend that increased government spending may accelerate economic growth. As a result, all the independent variables are expected to be positively correlated with the GDP aside from the error term, which will likely be zero.

4. Results and discussion

The analysis starts with descriptive statistics testing, followed by unit root testing using the Augmented Dickey-Fuller test. The autoregressive distributed lag (ARDL) short-run estimation approach was also implemented to measure the short-run impact as well as the ARDL Bound test to measure long-run impact. All variables are estimated in logarithm form. According to the ADF test results, all the variables were stationary at the first difference, and none were stationary at a level as shown in Table 2.

Table 2: Unit root test

	Augmented Dickey-Fuller (ADF)	
Variables	**Level**	**First Difference**
GDP	0.4889	0.0000
EXP	0.5143	0.0008
C	0.4555	0.0000
OPEN	0.0656	0.0089
LB	0.9493	0.0019

There were 162 models assessed, and the best-fitting ARDL model selected through the regression method for this dataset was ARDL (2,0,2,0,0). The Schwarz criteria (SIC) was chosen as the model selection approach since it produces a lower value for the model, which is preferable.

The ARDL short-run estimation mainly determines the short-run relationship between the dependent variable, GDP, and the independent and control variables in this study, EXP, C, OPEN, and LB. The results in Table 3 show that all of the factors have a short-run association with GDP. Two of the variables, EXP and C, indicate a negative short-run association, but OPEN and LB show a positive relationship with GDP.

For the bound test and long-run estimation, the findings in Table 4 reveal that the value of the F-statistic is 15.48471, indicating that it is greater than the upper bound values at a 5% significance level. The results show that there is cointegration in the dataset, demonstrating the presence of a long-run link in this model.

The result for the long-run estimation is shown in Table 5. Based on the result, two of the variables shown to have a positive long-run relationship with the GDP are OPEN and LB meanwhile another variable EXP and C show a negative long-run relationship with GDP. This can conclude that in the long run, some of the variables are significant namely EXP, OPEN and LB which indicates the null hypothesis. Is rejected. It means that there is a significant relationship between total government expenditure, trade openness and labor expenditure with economic growth. Meanwhile, for LB, this study accepts the null hypothesis which states that there is no significant relationship between capital expenditure and economic growth.

Table 3: ARDL short-run estimation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP (-1)	0.278003	0.152140	1.827287	0.0813
GDP (-2)	0.188542	0.152340	1.237641	0.2289
EXP	-0.069851	0.022929	-3.046378	0.0059
C	0.090716	0.034138	2.657365	0.0144
C (-1)	-0.026957	0.039093	-0.689557	0.4977
C (-2)	-0.097771	0.034356	-2.845828	0.0094
OPEN	0.343705	0.055771	6.162779	0.0000
LB	0.667848	0.222388	3.003079	0.0065
Constant	-13.45450	3.076787	-4.372907	0.0002

Table 4: Bound test

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	15.48471	10%	2.2	3.09
k	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

Table 5: ARDL long-run estimation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXP	-0.130940	0.055125	-2.375350	0.0267
C	-0.063758	0.084252	-0.756751	0.4572
OPEN	0.644301	0.142980	4.506226	0.0002
LB	1.251931	0.177751	7.043156	0.0000

Next, the estimation divides government spending into five economic sectors: housing, healthcare, social, defense security, and education expenditure. Based on the results of the long-run ARDL test reported in Table 6, this study concludes that two categories of expenditures provide considerable value: housing and education expenditures. This conclusion contradicts Alshahrani and Alsadiq's (2014) claim that expenditure in the housing sector boosts output. Meanwhile, findings confirming Kamis et al.'s (2020) analysis indicate a negative relationship between education expenditure and Malaysian economic growth.

Table 6: ARDL long-run estimation with disaggregate government expenditure

Explanatory Variables	ARDL 1	ARDL 2	ARDL 3	ARDL 4	ARDL 5
Capital	0.048478	-0.014593	0.021376	0.011505	-0.025488
	(0.1402)	(0.7606)	(0.6050)	(0.7939)	(0.5299)
Trade Openness	0.467564	0.173930	0.169165	0.190329	0.329883
	(0.0000)	(0.0205)	(0.0409)	(0.0151)	(0.0000)
Labor	0.569335	0.020244	0.255214	0.334477	0.555127
	(0.0119)	(0.9572)	(0.4764)	(0.3326)	(0.0276)
Housing Expenditure	-0.047527	-	-	-	-

	(0.0021) ***				
Healthcare Expenditure	-	-0.015847 (0.3773)	-	-	-
Social Expenditure	-	-	0.001244 (0.9545)	-	-
Defense Security	-	-	-	-0.016558 (0.5678)	-
Education Expenditure	-	-	-	-	-0.046214 (0.0031) ***

5. Conclusion

According to the results and discussion, this study found that the changes in independent variables, total expenditure which sum of housing, healthcare, social, defense security and education expenditure meanwhile control variables are capital, trade openness and labor had an impact on economic growth in the short run and long run. The result obtained by the ARDL test and Bound Test indicates that there is a long-run relationship between variables.

These findings show that the Malaysian economy does not fit the Keynesian hypothesis. In other words, the evidence suggests that lower government expenditure improves the real GDP growth rate. The fact that government spending and economic growth have a negative relationship suggests that it may be a signal that government expenditure is not a cause of economic growth, as has been suggested by Wagner's law.

Based on the estimated result, the total expenditure has been found to have a significant impact on economic growth in Malaysia. The total expenditure is the sum of housing, healthcare, social, defense security and education expenditures. In detail, for housing, this outcome is consistent with the findings by past researcher Uwatt, (2019) states that there is an excellent possibility that the housing industry and the services it provides will spur economic expansion and development. The housing industry has been used as a growth engine in many of the world's economies.

Subsequently, in the context of healthcare, this finding aligns with Kamis et al. (2020), which asserts that healthcare represents the most significant component of government expenditure impacting economic growth in Malaysia. Additionally, the study by Alam et al. (2010) concludes that social sector expenditures can influence economic growth. Social expenditures enhance productivity through the provision of infrastructure, healthcare, and education, while also resolving the interests of public and private sectors. This outcome aligns with findings from prior research regarding defense security. Yildirim and Ocal (2016) demonstrate that military spending and GDP exhibit a close geographical variation. Exploratory spatial analysis indicates a statistically significant positive spatial association between real income and military spending. In the meantime, with respect to education expenditure, analysis within 14 Asian countries (Bangladesh, China, Hong Kong, India, Japan, Nepal, Pakistan, Malaysia, The Philippines, Saudi Arabia, Singapore, Sri Lanka, Thailand, and Turkey) indicate a positive and statistically significant effect of education expenditures on economic development (Mallick et al, 2016). in summary, this study concludes that total expenditures, covering housing, healthcare, social services, defense security, and education, can enhance economic growth in Malaysia.

Other than that, capital which uses gross capital fixed as a proxy, the result indicates that the impact on economic growth is insignificant. According to the classical growth theory, capital will advance economic development. This result is inconsistent with the results reported by Alexiou (2009). Meanwhile, for trade openness which uses the total of imports and exports as a proxy, the results show a significant impact on economic growth. This supports the previous study by Hasnul (2015) states that the effect of the level of trade on economic growth turns out to be negative and significant in the base model. Lastly for labor, this study indicates that labor also has a significant impact on fostering economic growth in Malaysia. A past study from Hasnul(2015), shows a positive correlation with economic growth.

This research has several limitations. The study only examines a small number of distinct economic sectors. This may have an impact on the variables' ability to depend on one another. It also takes time to look at every facet of the economy. Every variable takes time to produce, and in Malaysia, there aren't as many variables available to measure the government's expenditures as there are in the World Bank's data. The policy implications of a study on government expenditure and economic growth are crucial for guiding policymakers in formulating effective strategies to foster sustainable development. In this study, some variables show a positive significant impact on economic growth which are trade openness and labor expenditure. Hence, policymakers may consider maintaining or increasing fiscal stimulus during economic downturns to boost aggregate demand. Meanwhile, for the insignificant which indicates that the expenditure does not influence the economic growth, a more cautious approach to budgeting may be necessary.

Recommendations

As for the recommendation for better future research in government expenditure, the researcher can expand the empirical study with cross-country comparison as the effects may vary from different country settings. By comparing the role of government expenditure on economic growth with different country settings, it can identify best practices and possible areas for improvement. Apart from that, the econometric analysis will also assist in giving Malaysian policymakers direction on how to comprehend and investigate the key elements influencing economic growth. They could find new measurements that were possibly overlooked because the country's trends are always shifting.

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Effect of Foreign Direct Investment, Energy Consumption and Unemployment on Income Distribution in Malaysia

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Abstract: The paper analyses the relationships between Foreign Direct Investment (FDI), Energy Consumption, Unemployment, and their effects on Income Distribution in Malaysia from 1990-2022. Despite economic growth, Malaysia faces income inequality, especially among ethnic groups. The study uses ARDL regression to find that FDI promotes income distribution by creating jobs and facilitating technology transfer. Increased energy availability boosts industrial production, which is crucial for equitable income distribution. High unemployment, particularly among graduates, exacerbates income inequality. Government initiatives aim to address unemployment through skills enhancement and entrepreneurship. The study concludes that FDI and energy consumption positively influence income distribution, while unemployment has a negative impact. The findings are valuable for policymakers in fostering inclusive growth and equitable income distribution in Malaysia. As Malaysia is an export-oriented country, these insights can lead to impactful improvements in the export sector, further boosting employment opportunities and economic resilience.

Keywords: *Income Distribution; Energy Consumption, Foreign Direct Investment, Unemployment*

1. Introduction and Background

Income distribution is a crucial measure of economic health and social equality, reflecting how wealth and resources are allocated within a population (Butt et al., 2022). In Malaysia, historical economic disparities originated during colonial times when different ethnic groups were assigned specific economic roles: the Chinese in trade and industry, Indians in plantation agriculture, and Malays in subsistence farming. Post-independence, the New Economic Policy (NEP) of 1971 aimed to address these disparities by enhancing the economic participation of Malays and other indigenous groups (Bumiputeras) through affirmative action (Mamun et al., 2020). Although the NEP reduced extreme poverty and increased Bumiputera's economic involvement, structural imbalances and urban-rural disparities persisted. The Gini coefficient, measuring income inequality from 0 (perfect equality) to 1 (perfect inequality), showed a downward trend in Malaysia over recent decades inequality (Azam et al., 2021; Esquivias et al., 2022; Rahman et al.,2022). In the 1970s, the coefficient was around 0.51 but improved to 0.39 by 2019 due to economic development and government initiatives. Despite progress, income inequality remains exacerbated by the COVID-19 pandemic, which intensified job losses among low-income groups (Masseran et al., 2019). The government responded with stimulus packages and financial aid, but long-term impacts on income distribution are yet to be fully seen. The pandemic also accelerated Malaysia's digital transformation, highlighting the need to bridge the digital divide. Foreign Direct Investment (FDI) has been crucial for Malaysia's economic growth, especially in manufacturing, services, and high-tech sectors (Malik and Tamat, 2019). Although FDI declined during the pandemic, recovery signs were evident in 2021 and 2022. The oil and gas sector and investments in renewable energy and tourism remain significant for FDI. Energy consumption, predominantly from fossil fuels, is essential for economic growth (Abbas et al., 2022). Malaysia's energy intensity is high compared to global standards, though it has improved. The government's focus on sustainability reflects efforts to reduce carbon emissions (Ali, 2022). Unemployment has varied over time, peaking at 5.3% in May 2020 due to the pandemic. Youth and gender disparities in unemployment highlight ongoing inequality issues.

The literature on the impact of Foreign Direct Investment (FDI) on income distribution presents mixed views. Some research suggests that FDI promotes equal income distribution, while other studies indicate it exacerbates income inequality. In Malaysia, evidence on the relationship between foreign investment and income inequality needs to be clarified, with findings suggesting that FDI might influence income inequality directly or indirectly through its effects on economic growth. This highlights the need for further investigation into this complex relationship. Another significant factor influencing income inequality is the energy market. There is a notable dynamic between energy consumption and income distribution. The use of renewable energy

has been linked to reductions in income inequality, as energy security—ensuring a reliable and stable supply of energy at reasonable prices—plays a crucial role in economic and social development (Rodon et al., 2021). Energy is essential for domestic activities such as lighting, cooking, and heating. Disruptions in energy access can severely impact households, affecting their social and economic well-being. Therefore, understanding how energy consumption affects income inequality is crucial for policymakers. Malaysia's economy is driven by a robust export industry, which generates a lot of job possibilities, particularly in the manufacturing and services sectors. The nation supports industrial growth by ensuring a steady supply of resources through a strategic energy policy. These measures promote economic growth and raise living standards while helping Malaysia maintain its competitiveness on the world stage.

The research gap this study addresses is the limited exploration of the combined effects of foreign direct investment (FDI), energy consumption, and unemployment on income distribution in Malaysia. While previous studies may have examined these factors individually, more comprehensive research needs to analyze their interconnected impact over an extended period, particularly from 1990 to 2022. This study seeks to fill that gap by providing a holistic understanding of how these variables collectively shape income inequality in Malaysia, which is crucial for informed policymaking. It seeks new insights into addressing income inequality, a significant concern for the Malaysian government. Whether strategies to attract more FDI, enhance energy access, and reduce unemployment will effectively address income inequality remains to be seen. The government aims to implement strategies to lower the Gini coefficient and improve income distribution (Sani et al., 2020). Understanding the underlying causes of income inequality is essential for developing effective policies and refining existing ones. This study focuses on three key variables—FDI, energy consumption, and unemployment—to evaluate their effects on income inequality.

2. Literature Review

Income Distribution In Malaysia

The relationship between economic growth and income distribution has been a central focus of economic research, with the "Kuznets Curve" being one of the most influential hypotheses in this domain. Proposed by Simon Kuznets in 1955, the Kuznets Curve posits that income inequality follows an inverted U shape as a country progresses through different stages of economic development. According to Kuznets, income inequality tends to rise during the initial phases of economic growth. This increase is attributed to structural transformations within the economy, where a shift from agriculture to industrialization typically benefits a minority with capital or skills suited to the emerging sectors, leaving the majority initially behind.

The Relationship Between Foreign Direct Investment of Malaysia and Income Distribution

Developing and transitioning countries increasingly see FDI as a role in economic development, modernization, income growth, and job creation. The Solow-Swan model highlights its role in increasing capital formation, technological progress, and productivity. According to Solow (1956) and Swan (1956), FDI contributes to economic growth by bringing in new technology, managerial expertise, and investment capital, increasing the host economy's productive capacity. This influx of capital and knowledge can lead to higher economic growth rates as domestic industry benefits from increased efficiency and innovation (Bekmurodova, 2020). Foreign direct investment (FDI) can support long-term income growth through productivity impacts and technology spillovers. There are two ways that the productivity spillover from FDI can impact the development of regional income. The first is through the vertical engagement of international and domestic businesses, fostering stronger ties and spillovers with clients and suppliers. Second, because local businesses gain from the demonstration, foreign enterprises can provide spillovers to domestic businesses operating in the same industry through horizontal partnerships.

Empirical studies indicate that FDI has been a significant driver of economic growth in Malaysia, contributing substantially to the country's industrialization and modernization efforts. Hira et al. (2019) document how FDI has facilitated Malaysia's transition from an agriculture-based economy to an industrially diversified one. However, the distribution of these benefits has been uneven. FDI in Malaysia has predominantly flowed into manufacturing sectors, particularly the electronics and petroleum industries. Ismail (2001) notes that these sectors have created numerous jobs and increased wages, contributing to economic growth. While FDI can create jobs and stimulate economic growth, there is a concern that it may exacerbate income inequality if not

adequately managed. Referring to Rasiah, Asirvatham, and Adamu (2017), policymakers in Malaysia need to implement measures that promote inclusive growth and ensure that the benefits of FDI are shared among all segments of society. One way to achieve this balance is through targeted policies encouraging FDI in sectors with a high potential for job creation and value addition. The inverse link implies that macroeconomic volatility may exacerbate the income gap in Africa. Malik and Tamat (2020) investigated the effects of FDI on wealth inequality and the ability of relationship-dependent children to absorb information using data from 54 countries between 1980 and 2005. Studies from Mukaramah-Harun (2015) show that although FDI has contributed to overall economic growth and development, it has also increased income inequality in specific periods and regions. This observation implies that FDI can increase income disparity when a country first develops but reduce inequality as development continues.

H_1: There is a positive relationship between Foreign Direct Investment in Malaysia and Income Distribution.

The Relationship Between Energy Consumption in Malaysia and Income Distribution

The economic literature well documented the relationship between energy consumption and economic growth. Utilizing sophisticated econometric models and statistical techniques, Walheer's studies reveal that fluctuations in energy consumption can lead to substantial variations in economic output. This theoretical framework posits that energy is not merely an ancillary input but a core driver of economic activity. For instance, when there is an increase in energy availability, it can significantly boost industrial production by enabling factories to operate at higher capacities and allowing businesses to expand their operations. This theoretical framework is particularly pertinent. Malaysia's rapid industrialization and economic development have historically been closely linked to its energy consumption patterns. Recent research by Rahman et al. (2017) and empirical studies on Malaysia corroborate Walheer's findings, demonstrating a strong correlation between energy consumption and economic growth.

Recent arguments highlight that as Malaysia continues to advance towards a knowledge-based economy, the role of energy in supporting technological innovation becomes even more critical (Shadman et al., 2021). Access to reliable and affordable energy is essential for powering high-tech industries and supporting digital transformation initiatives. This is particularly relevant in electronics, biotechnology, and information and communication technology (ICT), where energy-intensive processes are fundamental to production and innovation. Research by Schulte and Heindl (2017) indicates that low-income families tend to exhibit weaker responses to price fluctuations than high-income households. Environmental degradation, such as air and water pollution from fossil fuel use, disproportionately impacts low-income communities that may lack the resources to mitigate these impacts. Promoting sustainable practices in industries that heavily contribute to carbon emissions could positively affect the environment and income distribution (Ran & Xu, 2023). By incentivizing businesses to adopt greener technologies and reducing their reliance on fossil fuels through policies targeting greenhouse gas reductions, Malaysia could create an ecosystem where resources are allocated more equitably while mitigating climate change risks (Ismail et al., 2020). The findings suggest that increased consumption of renewable energy reduces income inequality.

H_2: There is a positive relationship between Malaysia's energy consumption and income distribution.

The Relationship Between Unemployment in Malaysia and Income Distribution

Unemployment refers to being without a job, while income distribution refers to how income is divided among individuals or households in a society (Janice et al., 2021). Phillips Curve Theory, formulated by economist A.W. Phillips in 1958, proposed an inverse relationship between unemployment and inflation. According to this theory, when unemployment is low, labor becomes increasingly scarce, causing employers to compete for workers by raising wages. Higher wages increase consumer purchasing power, leading to higher demand for goods and services, which can then raise prices, resulting in inflation. Conversely, when unemployment is high, the pressure on wages is reduced, and inflation tends to be lower (Sreenu, 2023). This theory suggests policymakers face a trade-off between reducing unemployment and controlling inflation.

Recent studies and empirical evidence suggest that Phillips Curve dynamics can be observed in the Malaysian economy (Fung & Nga, 2023; Norhashim et al., 2019; Ghorpade et al., 2024). For example, a period of low unemployment in Malaysia has been linked to rising wages, particularly in sectors experiencing labor shortages, such as manufacturing, construction, and services. Recent arguments highlight that the relationship between unemployment and inflation in Malaysia is influenced by several factors, including global economic

conditions, labor market dynamics, and policy interventions (Hassan et al., 2023). For example, external shocks such as international oil price fluctuations can affect inflation independently of the domestic unemployment rate. Chan and King (2020) claimed fewer job opportunities are often available if high unemployment rates are high. This can result in a higher concentration of wealth among those employed, leading to an unequal income distribution. Law (2018) states income inequality can also impact unemployment rates. The primary sector offers stable, high-paying jobs with benefits, while the secondary sector consists of low-paying, unstable jobs with minimal benefits. The findings suggest a negative relationship between unemployment and income distribution in Malaysia.

H_3: There is a negative relationship between Unemployment in Malaysia and Income Distribution.

3. Research Methodology

Data and Variables Explanation

Due to data availability, this study used annual data from 1990 to 2022 as a sample period. A summary of the data and its sources is shown in Table 1 below.

Table 1: Variables description

Variables	Indicator	Source
Income Distribution	Gini coefficient index (GINI)	World Development indicators
Foreign Direct Investment	Foreign direct investment, net inflows (% of GDP)	World Development indicators
Energy Consumption	Energy use	World Development indicators
Unemployment	Unemployment rate	World Development indicators

Note: The GINI index values range from 0 to 100, where 0 represents perfect equality while 100 represents perfect inequality. The higher the value of the coefficient, the higher the degree of inequality

Estimation Procedures

The general functional form of the income distribution model for Malaysia was derived as follows:

GINIt = f (FDIt, ENCt, UEt,)

where

GINIt represents income distribution,

FDIt represents foreign direct investment inflows,

ENCt represents energy consumption,

UEt represents unemployment.

The variables in Equation were transformed into log-linear forms (LN). The log version of the variables indicates the short-run and long-run elasticity. The log version of the model derived from the Equation can be seen as follows:

$$LNGINIt = \beta 0 + a1LNFDIt + b2LNENCt + s3LNUEt + \varepsilon it$$

FDI is crucial in boosting economic growth and improving citizens' living standards (Azam et al., 2021; Esquivias et al., 2022; Rahman et al.,2022). Foreign direct investment (FDI) has emerged as a critical driver of economic growth and development in countries worldwide. FDI refers to the investment made by individuals, businesses, or governments from one country into another to establish a lasting interest in the host country. Energy consumption plays a crucial role in shaping the income distribution dynamics of a country like Malaysia. The impact of energy consumption on income distribution dynamics cannot be understated, especially in Malaysia. Energy consumption affects the economy and significantly affects how wealth is distributed among different segments of society. How we produce and consume energy directly impacts job creation, economic growth, and access to essential services (Ayomitunde et al., 2021). Understanding the relationship between unemployment and income distribution is crucial for policymakers and economists alike. Unemployment refers to being without a job, while income distribution refers to how income is divided among individuals or households in a society (Janice et al., 2021). The two concepts are interconnected, as high levels of unemployment can lead to unequal income distribution and vice versa. Chan and King (2020) claimed fewer job opportunities are often available if high unemployment rates are high. As for these studies, we expected a

positive sign between FDI and energy consumption towards income distribution. To conclude, unemployment is expected to impact income distribution negatively.

The cointegration of the variables in the study was examined using an autoregressive distributed lag (ARDL) bound test. ARDL was applied to determine the cointegration of short-run and long-run relationships between variables. ARDL is relevant for small data sets and undertakes the variable's integration order at I(0) or I(1). The ARDL model based on the unrestricted error correction model (UECM) is stated below:

$$\Delta LNGINIt = \beta_1 + \theta_0\, LNGINI_{t-1} + \theta_1 LNFDI_{t-1} + \theta_2 LNENC_{t-1} + \theta_3 LNUE_{t-1} + S\Delta LNGINI_{t-i} + \sum_{i=0}^{b} \alpha_i\, \Delta LNFDI_{t-i} + \sum_{i=0}^{c} \gamma_i\, \Delta LNENC_{t-i} \sum_{i=0}^{d} \lambda_i\, \Delta LNUE_{t-i} + u_t$$

$$\Delta LNFDIt = \beta_1 + \theta_0\, LNGINI_{t-1} + \theta_1 LNFDI_{t-1} + \theta_2 LNENC_{t-1} + \theta_3 LNUE_{t-1} + the \sum_{i=1}^{a} \beta_i\, \Delta LNFDI_{t-i} + \sum_{i=0}^{b} \alpha_i\, \Delta LNGINI_{t-i} + \sum_{i=0}^{c} \gamma_i\, \Delta LNENC_{t-i} \sum_{i=0}^{d} \lambda_i\, \Delta LNUE_{t-i} + u_t$$

$$\Delta LNENCt = \beta_1 + \theta_0\, LNGINI_{t-1} + \theta_1 LNFDI_{t-1} + \theta_2 LNENC_{t-1} + \theta_3 LNUE_{t-1} + \sum_{the\ i=1}^{a} \beta_i\, \Delta LNENC_{t-i} + \sum_{i=0}^{b} \alpha_i\, \Delta LNGINI_{t-i} + \sum_{i=0}^{c} \gamma_i\, \Delta LNFDI_{t-i} \sum_{i=0}^{d} \lambda_i\, \Delta LNUE_{t-i} + u_t$$

$$\Delta LNUEt = \beta_1 + \theta_0\, LNGINI_{t-1} + \theta_1 LNFDI_{t-1} + \theta_2 LNENC_{t-1} + \theta_3 LNUE_{t-1} + \sum_{i=1}^{a} \beta_i\, \Delta LNUE_{t-i} + \sum_{i=0}^{b} \alpha_i\, \Delta LNGINI_{t-i} + \sum_{i=0}^{c} \gamma_i\, \Delta LNFDI_{t-i} \sum_{i=0}^{d} \lambda_i\, \Delta LNENC_{t-i} + u_t$$

Where Δ is the first difference operator, and it is the white-noise disturbance term? Residuals for the UECM should be serially uncorrelated, and the model should be stable. The diagnostic tests listed in the analysis section can be used to address this validation. According to the primary model, historical values might affect and clarify the income distribution (LNGINI) level. It, therefore, involves additional shocks or disruptions. The long-run elasticity from the UECM estimation equals the coefficient of the one-lagged dependent variable divided by the coefficient of the one-lagged explanatory variable (multiplied by a negative sign). The first differenced variable's coefficients capture the short-term effects. In the long-term connection, the null of no cointegration is defined as follows:

Hypothesis H0 (H0). Income Distribution = FDI = Energy Consumption = Unemployment = 0 (there is no long-run relationship), is
tested against the alternative.

Hypothesis H1 (H1). Income Distribution ≠ FDI ≠ Energy Consumption ≠ Unemployment ≠ 0 (a long-run relationship exists).

Assume the calculated F-statistic is smaller than the lower-bound critical value and apply the well-known F-test. Then, we do not rule out the null hypothesis of no cointegration. However, consider that the calculated F-statistics are higher than the 10% significant level's upper bound critical value. We then reject the null hypothesis that there is no cointegration.

4. Results

As with other time series analysis processes, the first step usually involves determining the unit root of each variable that will be studied. The data's stationarity was determined using two-unit root tests: Phillips-Perron (PP) and Augmented Dickey-Fuller (ADF). The unit root tests show that the energy use, FDI, and Gini coefficient are I(1) variables because they are non-stationary at their levels but become stationary after first differencing. This indicates that to attain stationarity, these variables must be differentiated due to their stochastic trend. We moved on to the PP unit root test since it was thought to be more effective than the ADF unit root test because of the mixed stationarity of this result. The mixed stationarity trend is once more identified for the PP

unit root test at the level, intercept, and trend. Therefore, we deduced that the mixed stationarity model—also referred to as ARDL estimation—satisfies the criterion for a bound test.

Table 2: Testing ADF and PP unit root

Variable	Unit Root Test			
	Augmented Dickey-Fuller		Phillips-Perron	
	Level	1st Difference	Level	1st Difference
Gini	-0.986 (0)	-5.542 (0) ***	-0.986 (0)	-5.624 (3) ***
FDI	-4.773 (0) ***	-6.449 (1) ***	-4.767 (2) ***	-24.954 (28) ***
Energy use	-2.410 (2)	-5.997 (0) ***	-4.513 (13) ***	-6.807 (6) ***
Unemployment	-2.383 (0)	-4.107 (0) ***	-2.253 (4)	-3.563 (9) **

Note: 1. ** and *** 5% and 1% of significant levels, respectively. 2. The optimal lag length is selected automatically using the Schwarz info criteria (SIC) for the ADF test. The bandwidth was selected using the Newey–West method for PP.

Next, we need to determine whether long-run cointegrating exists for our suggested model before moving on to ARDL short—and long-term forecasting. The F statistic validated the long-run cointegrating link between LNGINI, LNFDI, LNENC, and LNEU. At a 10% significance level, a long-run cointegrating vector in this model is validated by the F statistic of 3.925, which is more significant than the 10% threshold based on the income distribution model. The income distribution model will be the exclusive foundation for the following study.

We performed several diagnostic tests, including the serial correlation, multicollinearity, heteroscedasticity, normality test, and CUSUM/CUSUMSQ test, to ensure we could generate a trustworthy result. The results are shown in Figure 1, Tables 3, 4, and 5. It is verified that the model is free of all diagnostic issues since the probability value of every test is more than the 10% significant level. The blue line within the two dotted lines in the CUSUM and CUSUMSQ tests shows the model's short- and long-term stability.

Table 3: Diagnostic Test 1

Model	Lag Order	F Statistic
LNGINI = f (LNFDI, LNENC, LNUE)	(1, 1, 1, 2)	3.926**
LNFDI= f (LNGINI, LNENC, LNUE)	(1,0,1,0)	7.363**
LNENC= f (LNGINI, LNFDI, LNUE)	(1,0,0,0)	6.252**
LNUE= f (LNGINI, LNFDI, LNENC)	(1,0,0,0)	3.642
Critical Values for F Stat	Lower I (0)	Upper (1)
10%	2.37	3.2
5%	2.79	3.67
1%	3.65	4.66

Note: The critical values are based on Pesaran et al. (2001), case III: unrestricted intercept and no trend. 2. k is several variables equivalent to 6. 3. **and *** represent 5% and 1% significance, respectively. Estimation was based on the Schwarz criterion (SC). The maximum lag set is (2, 2).

Table 4: Diagnostic Test 1

(A)	(B)	(C)
Normality	Autocorrelation	Heteroskedasticity
[*p*-Value]	[*p*-Value]	[*p*-Value]
1.281884	0.021545	1.173274
[0.52679]	[0.9446]	[0.0018]

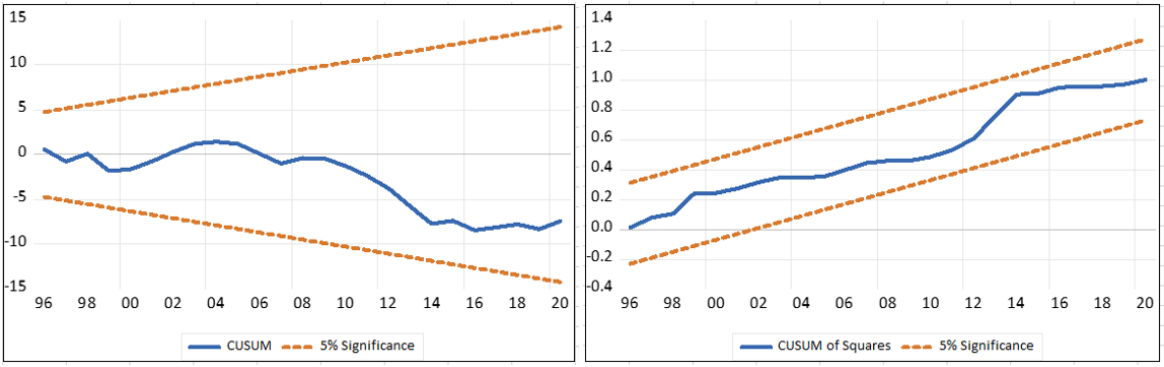
Note: The diagnostic test performed as follows: A. based on a test of skewness kurtosis of residuals; B. Breusch-Godfrey Serial Correlation LM Test; C. ARCH Test.

Table 5: Diagnostic Test 2

(D) Variable	Coefficient Variance	Uncentered VIF	Centered VIF
FDI	1.08E-20	7.272539	1.827202
ENERGY_USE	5.05E-07	36.62504	1.653174
UNEMPLOYMENT	0.568194	82.39304	1.136360

Note: The diagnostic test performed as follows: D. Multicollinearity Variance Inflation Factors

Figure 1: CUSUM and CUSUMQ



After confirming the model's reliability, we were ready to proceed with Auto Regressive Distributed Lag Models. In the short run, the elasticity coefficients indicate the immediate effects of changes in FDI, energy consumption, and unemployment on income distribution. The coefficient for the first difference of FDI is -0.005, which implies a negative but statistically insignificant short-run impact of FDI on income inequality. This suggests that short-term fluctuations in FDI do not significantly influence income distribution in Malaysia, consistent with findings by Borensztein et al. (2017) that emphasize the importance of absorptive capacity and the longer-term impacts of FDI on economic outcomes. The coefficient for the first difference in energy use is -0.046, indicating a negative short-run relationship between energy consumption and income inequality. Although this relationship is not statistically significant, the negative coefficient suggests that reduced energy use may initially influence income inequality, possibly due to the uneven distribution of benefits from energy-intensive industries. This reflects the complex nature of energy's impact on economic distribution, as discussed by Sadorsky (2010). The coefficient for the first unemployment difference is -0.035, showing a negative but statistically insignificant short-run effect on income inequality. This suggests that short-term changes in unemployment rates do not strongly affect income distribution, supporting the argument by Blanchard and Katz (1992) that labor market adjustments and their impact on income inequality are typically observed over more extended periods.

The CointEq(-1) coefficient, representing the speed of adjustment towards long-run equilibrium, is -0.477 and statistically significant at the 5% level. This indicates that approximately 47.7% of the disequilibrium from previous periods' shocks is corrected within the current period, highlighting a moderate adjustment speed toward equilibrium. This finding is consistent with the adjustment dynamics observed in similar studies, such as Narayan and Smyth (2006).

The long-run elasticity coefficients offer more robust insights into the relationships between the variables over an extended period. The long-run coefficient for FDI is -0.030, statistically significant at the 5% level, suggesting that an increase in FDI is associated with a reduction in income inequality over time. This finding aligns with the literature emphasizing the potential of FDI to foster economic growth and reduce inequality, particularly in developing countries, as highlighted by Chintrakarn et al. (2019). The long-run coefficient for energy use is -0.194, which is also significant at the 5% level, indicating that higher energy consumption is associated with decreased income inequality in the long run. This result may reflect the role of energy in supporting industrial activities that generate widespread economic opportunities, a relationship corroborated by the studies of

Apergis and Payne (2021). The long-run coefficient for unemployment is 0.082, which is not statistically significant. This suggests that unemployment does not have a considerable long-term impact on income inequality in Malaysia, consistent with studies that find mixed evidence regarding the relationship between unemployment and income distribution, such as those by Galbraith and Kum (2015).

The constant term in the long-run equation is 5.853 and is highly significant, capturing the baseline level of the Gini coefficient when all other variables are held constant. This aligns with the general observation that baseline income inequality can persist despite fluctuations in different economic variables.

Table 5: Short Run and Long Run Elasticities

Short-Run Elasticities		Long-Run Elasticities	
Variables	**Coefficient**	**Variables**	**Coefficient**
D(LFDI)	-0.005	LFDI	-0.030**
D(LENERGY_USE)	-0.046	LENERGY_USE	-0.194**
D(LUNEMPLOYMENT)	-0.035	LUNEMPLOYMENT	0.082
CointEq(-1)*	-0.477**	C	5.853**

Note: 1. ***, **, and * are 1%, 5%, and 10% of significant levels, respectively.

Discussion

First, the relationship between FDI and income distribution was significantly negative. This implies that an increase in FDI leads to a reduction in income inequality in Malaysia. Descriptive statistics reveal that over the observed period, substantial foreign capital inflows were observed. This influx of investment will likely contribute to economic growth and job creation, thus increasing income distribution. The regression coefficient indicates that each unit increase in FDI significantly reduces the Gini coefficient, a general measure of income inequality. This finding supports the hypothesis that FDI is vital in stimulating economic growth and promoting a more equitable distribution of wealth.

The study found that energy consumption has a similar negative effect on income inequality. Average energy consumption over the period reflects the country's increasing energy needs as its economy grew. The regression coefficient for energy consumption indicates that higher energy consumption is correlated with a reduction in the Gini coefficient. This relationship can be linked to the role of energy in driving industrial and economic activity, which in turn creates jobs and improves living standards. The study proved that ensuring access to affordable and reliable energy can help reduce production costs, lower the prices of goods and services, and ultimately contribute to a more equitable income distribution.

Unemployment, on the other hand, has been found to exacerbate income inequality. The average unemployment rate during the study period reflected the varying conditions of the labor market. The regression coefficient for unemployment indicates that a higher unemployment rate significantly increases the Gini coefficient. These findings underscore the critical importance of addressing unemployment to improve income distribution. High unemployment reduces household income and limits access to essential services and opportunities for upward mobility.

5. Managerial Implications and Recommendations

By aligning their strategies with broader socio-economic goals, companies can play an essential role in promoting equitable income distribution for organizations operating in Malaysia. This can involve investing in regions with high unemployment rates, adopting inclusive employment practices, and supporting local communities through corporate social responsibility (CSR) initiatives. Additionally, by integrating sustainability into their operations, companies can contribute to reducing the negative impact of energy consumption on income distribution. By adopting such practices, organizations can improve their corporate image and contribute to Malaysia's socio-economic development.

Malaysia also needs to shift towards more sustainable energy use practices. Policymakers should focus on

promoting energy efficiency and investing in renewable energy sources. This can help reduce production costs, lower the prices of goods and services, and reduce adverse effects on income distribution. Malaysia can ensure more equitable economic development by fostering a sustainable energy sector. This study emphasizes the importance of job creation and workforce development programs. Policymakers should prioritize initiatives that improve job skills, provide vocational training, and stimulate sectors with high employment potential. In addition, encouraging entrepreneurship and small business development can create job opportunities and contribute to a more balanced income distribution. By addressing unemployment, Malaysia can take essential steps towards reducing income inequality and fostering inclusive growth.

Future research can build on these findings by incorporating additional variables such as education, healthcare, and technological progress. Education, for example, plays a crucial role in income distribution by equipping individuals with skills that enhance their employability and earning potential. Higher levels of education can lead to more equitable income distribution by reducing income disparities between different segments of the population. Healthcare, on the other hand, impacts income distribution by influencing the productivity and economic participation of the workforce. Access to quality healthcare can reduce income inequality by ensuring that everyone, regardless of socioeconomic status, can contribute effectively to the economy. Technological progress is another critical factor that can significantly impact income distribution. Technological advancements can increase productivity and economic growth, creating more job opportunities and higher wages.

Conclusion

This research has carefully analyzed the effects of Foreign Direct Investment (FDI), energy consumption, and unemployment on income distribution in Malaysia. The relationship between FDI and income distribution was found to be significantly negative. This finding supports the hypothesis that FDI is vital in stimulating economic growth and promoting a more equitable distribution of wealth. As Malaysia continues to attract foreign investment, it is indispensable to ensure that such investment is channeled into sectors that generate extensive employment opportunities and foster inclusive growth. However, ensuring that FDI is directed to sectors that generate substantial employment and promote inclusive development is crucial. In addition, the government should create a conducive environment for investors by improving infrastructure, streamlining regulations, and ensuring political stability.

The study found that energy consumption has a similar negative effect on income inequality. This relationship can be linked to the role of energy in driving industrial and economic activity, which in turn creates jobs and improves living standards. The findings on energy consumption highlight the need for sustainable energy policies. Malaysia can sustain economic growth by promoting energy efficiency and investing in renewable energy sources while minimizing environmental impact. Ensuring access to affordable and reliable energy can help reduce production costs, lower prices of goods and services, and ultimately contribute to a more equitable income distribution.

Unemployment, on the other hand, has been found to exacerbate income inequality. High unemployment reduces household income and limits access to essential services and opportunities for upward mobility. The government should focus on job creation, skill development, and labor market reforms to reduce unemployment. Investing in vocational education and training can equip the workforce with the skills needed to thrive in a dynamic economy, thereby reducing unemployment and promoting equitable income distribution.

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The Effect of Work Stress and Work Environment on Job Performance in Manufacturing Industry: A PLS-SEM Approach

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Abstract: Employee performance is a critical determinant of growth and success within manufacturing organizations, making it essential to understand the factors influencing it. This study delves into the effects of work stress and the work environment on job performance, specifically within the electronics manufacturing sector in Penang, Malaysia. The research addresses how role ambiguity and conflict can act as stressors and also explores how intrinsic and extrinsic motivation factors related to the work environment affect job performance. The study sample comprised 116 participants from five electronics manufacturing firms located in Bayan Lepas, Penang. Data collection was conducted through a structured questionnaire, and the analysis was performed using Partial Least Squares Structural Equation Modelling (PLS-SEM). The results confirmed that the measurement model was robust, providing a solid foundation for validating the structural model. The PLS-SEM analysis demonstrated that the model had significant predictive capability, revealing that both work stress and the work environment exert substantial effects on job performance within the electronics manufacturing industry in Penang. Specifically, role stressors such as ambiguity and conflict were found to negatively impact job performance, while a supportive and motivating work environment positively influenced it. The study's results align with the theoretical frameworks of role stressors and self-determination, suggesting that effective management of stressors and the cultivation of a motivating work environment are essential for optimizing employee performance in the manufacturing sector.

Keywords: *Works Stress, Work Environment, Job Performance, Electronics Manufacturing Industry.*

1. Introduction and Background

Competition in the manufacturing sector is increasingly intensified. The proliferation of new products and processes through invention and innovation has led to the firm's competitiveness. According to Solhi (2022), Penang is well on its way to becoming an innovation supercluster for the manufacturing industry because it adopted technology emerging from the fourth industrial revolution. This pertains to the correlation between employee productivity and the expectation for them to contribute extensively without taking into account the potential impact on their health and well-being (Engelbrecht et al., 2019). Stress has been an increasing problem in organizations and has been shown to negatively impact workplace productivity during the previous decade. Selye (1936) introduces the concept of stress in scientific research. Stress is a constant that affects workers all across the world (Dewe & Cooper, 2020). Employees' performance in the workplace is hindered by several factors. Every worker will likely experience some degree of stress related to their job at some point.

Employees' performance in the workplace is hindered by several factors. Every worker will likely experience some degree of stress related to their job at some point. Workers are the primary sufferers of work-related stress, but the company experiences the effect. Unhealthy health is a contributor to poor company efficiency, high turnover of workers, and sick days taken for both major and minor ailments, including obesity, heart disease, stomach issues, and mental health issues like anxiety and depression (Sari et al., 2020). There's a lot more stress in the workplace these days, and it's having an impact on everyone's productivity. Workplace stress is defined as the negative physiological and psychological reactions an individual has when their abilities, resources, and requirements do not match those of their employment. According to Sari et al. (2020), industrial sector employees might be negatively affected by work stress, which in turn leads to high turnover rates due to worker frustration caused by superior pressure.

Over the last few decades, the expansion of Malaysia's economy has been primarily reliant on the nation's electronics manufacturing sector, which has made major contributions to the country's gross domestic product, exports, and employment (Hashim & Abdullah, 2021). At the same time, studies conducted by Brady and Wilson

(2022) found that stress at work can significantly impact productivity. On the one hand, stress may be a driving force that gets people to do their best work and finish tough projects on time. That is because, these days, employers are becoming pickier about what they expect from their employees. Today's era has been aptly termed the 'Age of Anxiety and Stress' (Coleman, 1976). The level of stress experienced is generally related to the number of stressors one encounters. Conversely, Beehr and Newman (1978) describe stress as a condition where a person's usual functioning is disturbed or changed due to a shift in their psychological and or physiological state, whether for better or worse. Work stress has a negative and significant effect on employee performance, as found by the research of Putri and Suhartono (2021). Likewise, research shows that stress at work hurts productivity, there would not be any difficulties at work if stress levels were manageable. According to Nisa et al. (2023), the quality of the work environment has a significant effect on employee productivity. An improved work environment leads to increased productivity.

2. Literature Review

Job Performance

One of the critical determinants of a company's success is the management's ability to continually elevate performance standards across all levels of the organization. The topic of employee performance has been at the forefront of stakeholders' conversations for decades, and for good reason. In their study, Silitonga and Sadeli (2020) argued that the way an organization is perceived is directly affected by the performance of its employees. Performance has been seen as the result of both organizations and employees, according to Alase and Akinbo (2021). Organizational success and glory are attributed to productivity, service quality, employee happiness on the job, and loyalty to the company. As Pushpakumari (2008) emphasizes, the success of a company often hinges on how effectively management sets and maintains high-performance benchmarks for employees. This proactive approach ensures that only the most qualified candidates are selected and retained, fostering an environment where high performance is consistently achieved. The concept of job performance has been extensively explored in the literature, with Balouch and Hassan (2014) defining it as the effectiveness with which employees complete their assigned tasks. Performance is often viewed as a direct outcome of an individual's aptitude, skill, and effort within a given context, as noted by Lawler and Porter (1967). This perspective aligns with the notion that performance is not merely about the completion of tasks but also about the quality and efficiency with which these tasks are performed. Motowidlo (2003) offers a comprehensive definition, describing work performance as "the overall expected value to the organization of discrete behavioral episodes that an employee carries out over a standard period." This definition highlights the multifaceted nature of performance, which encompasses both the execution of specific job duties and the broader impact of these activities on organizational goals.

Work Stress

The term "stress" was coined by Dr. Hans Selye in 1956 to describe how people reacted to external factors that had an impact on their performance. Work stress has significant consequences on employee job performance and organizations, and it is present in all workplaces and all organizations because of the increased complexity of both. According to Rose (2003), long hours and high levels of concern about time decrease workers' motivation to do their best. Several factors contribute to stress at work, including family conflicts and work overload. According to Stamper and Johlke (2003), if an organization or its management fails to appreciate employees for their hard work or contributions, it can lead to increased stress and a higher likelihood of employees intending to leave the organization. According to Ahmed & Ramzan (2013), the research found that the majority of the workers were unhappy with the present culture where they were asked to work prolonged hours and cope with immense workloads while simultaneously reaching production objectives and deadlines.

When people are not able to manage their stress well, it shows in their interactions with everyone and everything around them, from coworkers to strangers. According to Virgiawan et al. (2021), the employee's performance at work was negatively impacted by the unfavorable symptoms they encountered. According to Greenberg et al. (2017), work stress is a concept that is very difficult to describe. Stress at work happens in someone when someone flees from difficulties as some workers raise the level of work to a predisposition to stress, job stress is a mix of causes of stress on the job, individual traits, and stressors outside the company. In view of the above, the following hypothesis was suggested for testing:

H1: *A significant relationship exists between work stress and employee job performance within the manufacturing sector*

Work Environment.

Normal temperatures, lack of unpleasant odors or dust, lack of crowding, and a serene atmosphere are all part of what we mean when we talk about a "work environment". Vischer, (2007), posits that unfavorable working circumstances contribute to employee stress and discontent on the job. Poor working circumstances may negatively influence the individual performance of workers. According to Aswar et al. (2022) "the work environment" refers to the physical setting in which workers perform their duties. Cleanliness, enough lighting, and a calm atmosphere are all features of this ideal workplace. Inside, there are two distinct personalities to be found in the workplace.

Furthermore, employees are easily distracted by a subpar working environment, resulting in less productivity (Yeow et al., 2014). Poor working conditions not only affect productivity but also increase the risk of occupational injuries. Capital returns might be negatively impacted by the prevalence of occupational accidents (Ng et al., 2014). According to research by Narasuci & Noermijati (2018), workers' productivity increases when they are provided with a pleasant and supportive workplace. Forms of environmental effects that give contextual characteristics promote or aid the formation of performance. In view of the above, the following hypothesis was suggested for testing:

H2: *A significant relationship exists between the work environment and employee job performance in the manufacturing sector*.

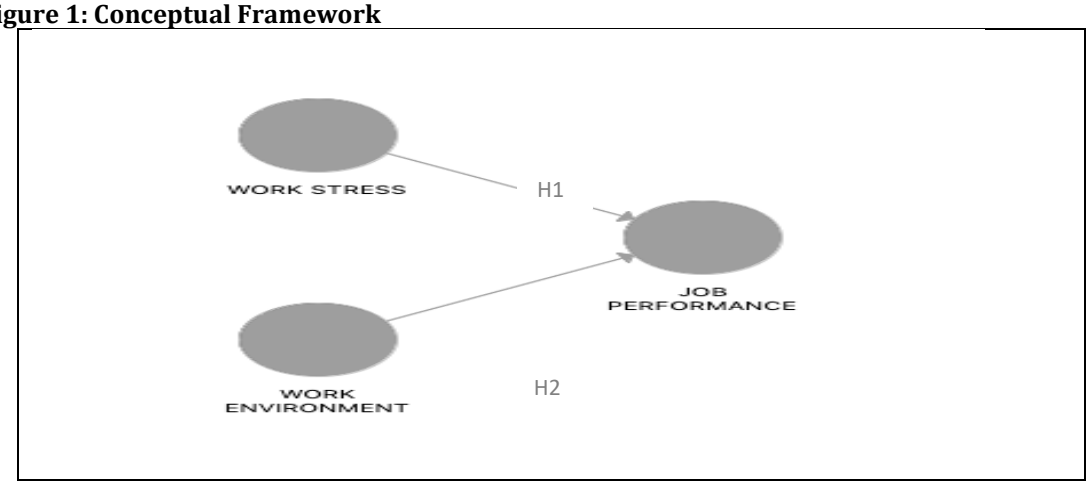
3. Research Methodology

This study adopted a quantitative approach that utilized a questionnaire survey in addressing the objectives of the study (1) To determine the relationship between work stress and employee job performance in a manufacturing company, (2) To determine the relationship between work environment and employee job performance in a manufacturing company. In addition, this study adopted the Likert scale to measure the responses. The study focuses on the impacts of work stress and work environment on job performance among manufacturer workers in selected electronic firms in Bayan Lepas, Pulau Pinang, Malaysia. Hence, the manufacturing workers will serve as the statistical unit of analysis in this study. The sample size was determined using the GPower calculator (effect size = 0.15 (for medium effect), alpha = 0.05, and power = 0.80). The GPower calculator suggested a minimum of 85 respondents. However, 116 usable responses conceived made a respectable percentage. This research will specifically examine the following research questions:

RQ1: What is the relationship between work stress and employee job performance in a manufacturing company?

RQ2: What is the relationship between work environment and employee job performance in a manufacturing company?

Figure 1: Conceptual Framework



The research examines two independent variables, work stress and work environment, and their direct influence on job performance (JP), which are measured through an observed variable. This study is grounded in the organismic metatheory of self-determination theory (SDT), which underscores the importance of developing internal resources for personality formation and behavioral self-regulation. Empirically, it has become a standard in the field of human motivation, and character is employed to assess their impact on overall job performance (Ryan et al., 1997). Figure 1 illustrates the study's conceptual framework, which includes the variables under investigation. Specifically, the latent variable of work stress (WS) is measured by five items, work environment (WE) is measured by five items, and job performance (JP) is measured by seven items. The best instrument to use to get standardized data from identical questions was a questionnaire survey. Thus, the questionnaire needs to be created according to the research objectives for this study. The questionnaire in this study was adapted from Sari et al. (2020) to align with the current study's context.

4. Results

The survey was conducted among employees from five selected electronics firms, and data was collected via an online questionnaire. Out of 145 distributed surveys, 121 were returned. After excluding five responses identified as outliers through an assessment of studentized residuals, the final dataset consisted of 116 usable responses. Outlier detection followed the guidelines proposed by Christopher et al. (2020), which suggest that studentized residuals outside the ±2 range warrant attention, while those beyond the ±3 range require serious consideration. Table 1.0 presents the outlier detection process, including the studentized residuals analysis performed using IBM SPSS.

Table 1: Outliers Detected using SPSS

RESPONDENT NO.	STUDENTIZED RESIDUAL
4	-3.87969
16	-2.74520
17	2.30179
23	2.16002
113	2.04360

Demographic data were collected and analyzed descriptively as the initial phase of the questionnaire, aiming to gather comprehensive, non-sensitive personal information from respondents, including age, gender, race, marital status, and monthly income. This detailed demographic information is crucial for contextualizing the study and understanding the characteristics of the participant pool.

As illustrated in Table 2.0, the majority of respondents were young adults aged between 20 and 29 years, comprising 74 employees, or 63.8% of the sample. The next largest age group was those aged 40 to 49 years, with 17 employees, or 14.7%, followed by individuals aged 50 to 59 years, totalling 10 employees, or 8.6%. Employees aged 30 to 39 years amounted to 8 individuals, or 6.9%, which is slightly higher than those below 19 years, who numbered 6 employees, or 5.2%. The smallest age category was those above 60 years, represented by only 1 employee, or .9%. Regarding gender distribution, the study included 69 male respondents (59.5%) and 47 female respondents (40.5%), indicating a higher proportion of male participants. Table 1.0 further reveals that most respondents were Malay, totalling 111 employees, or 95.7%, followed by Indian and other racial groups with 2 employees, or 1.7%, and Chinese respondents with 1 employee, or .9%.

In terms of marital status, 73 respondents were single (62.9%), 43 were married (37.1%), and there were no respondents classified as divorced, highlighting that a significant majority of participants were single. Regarding monthly income, the predominant income bracket was between RM1,201 and RM3,000, with 48 employees, or 41.4%, falling into this category. Additionally, 28 employees (24.1%) reported earning more than RM5,001, while 20 employees (17.2%) had incomes between RM3,001 and RM5,000, or below RM1,200. Consequently, the data suggest that most respondents' monthly incomes were concentrated in the RM1,201 to RM3,000 range, indicating a general trend towards financial stability among the participants.

Table 2: Demographic Profile of the Respondents (N=116)

Demographic	Category	Frequency (N)	Percentage (%)
Age	19 and under	6	5.2
	20–29	74	63.8
	30–39	8	6.9
	40–49	17	14.7
	50–59	10	8.6
	60 and above	1	.9
Gender	Male	69	59.5
	Female	47	40.5
Race	Malay	111	95.7
	Chinese	1	.9
	Indian	2	1.7
	Others	2	1.7
Marital Status	Single	73	62.9
	Married	43	37.1
	Divorced	0	0
Monthly Income	RM 1,200 and below	20	17.2
	RM 1,201 – RM 3,000	48	41.4
	RM 3,001 - RM 5,000	20	17.2
	RM 5,001 and above	28	24.1

To address the research objectives, this study utilized the SmartPLS 3 analytical tool to perform variance-based structural equation modelling (SEM) analyses, examining both the measurement and structural models. A two-stage approach was adopted in line with the methodological techniques proposed by Anderson. This approach involved distinct evaluations of the measurement model and the structural model. The first stage, focusing on the measurement model, is pivotal for assessing the reliability and validity of the study's items and latent constructs and the second stage is to assess the relationship between variables in the model, and it is essential for hypothesis testing (Ghozali & Latan, 2015; Sarstedt, Ringle, & Hair, 2021)

Measurement Model Analysis (First Stage)

During this phase, internal consistency was scrutinized through composite reliability (CR) and Cronbach's alpha, with the recommended thresholds set at .5 and .7, respectively (Fornell & Larcker, 1981; Hair et al., 2017). These initial outer model analyses were employed to ensure that the constructs demonstrated adequate reliability and validity. The results from the measurement model analysis confirmed that both the items and constructs met the requisite minimum cut-off points, thereby validating their robustness. Table 3.0 below provides a comprehensive presentation of the outcomes from these analyses, as obtained through the PLS-SEM technique for evaluating the measurement model.

Table 3: Internal Consistency and Convergent Validity Assessment.

Latent Construct	No. of Predictors (Items)	Cronbach Alpha	Composite Reliability (CR)	Average Variance Extracted (AVE)
WS (IV)	3 (2 were excluded due to low loading)	.894	.841	.645
WE (IV)	5	.816	.881	.598
JP (DV)	7	.894	.917	.612

In addition, measurement model assessment of discriminant validity was carried out, this study employed the HTMT (Heterotrait-Monotrait) criterion, a sophisticated approach for determining whether the constructs within the model are sufficiently distinct from one another (Henseler, Ringle, & Sarstedt, 2014; Hair et al.,2017). The selection of the HTMT criterion was deemed suitable by its advanced statistical capabilities and its superior

performance, especially in variance-based structural equation modelling (SEM), offering a more precise assessment of discriminant validity compared to traditional methods such as the Fornell-Larcker criterion or cross-loadings (Henseler et al., 2014; Sarstedt, Hair, Ringle, Thiele, & Gudergan, 2016).

Accordingly, established guidelines were referred to regarding the discriminant validity assessment. The analysis is confirmed to achieve discriminant validity if the HTMT coefficient falls below the critical threshold of .85 (Henseler et al., 2015). In this study, Table 4.0 provides a detailed presentation of the results obtained from the HTMT-based assessment, illustrating the effectiveness of this criterion in verifying the distinctiveness of the model's constructs.

Table 4: HTMT Criterion for Discriminant Validity Assessment.

	JP	WE	WS
JP (Job Performance)	1		
We (Work Environment	.790	1	
WS (Work Stress)	.738	.463	1

As for the measurement model assessments, the overall analysis results confirmed that the study employed valid and reliable measures for both items and constructs. The statistical justification for the measurement model indicated its suitability for further analysis of the structural model, specifically in predicting relationship paths and assessing the significance of the developed hypotheses.

Structural Model Analysis (Second Stage).

After the evaluation of the measurement model, the second stage of the PLS-SEM analysis focused on the assessment of the structural model to scrutinize the causal relationships among the latent constructs. This phase involved a meticulous examination of path coefficients (β) and the outputs from the bootstrapping routine to determine both the strength and significance of these inter-construct relationships. The evaluation of path coefficients was based on Cohen's (1988) criteria, which suggest that β values range from -1 to 1, with values closer to 0 indicating weaker relationships and those further from 0 reflecting stronger associations (Cohen, 1988).

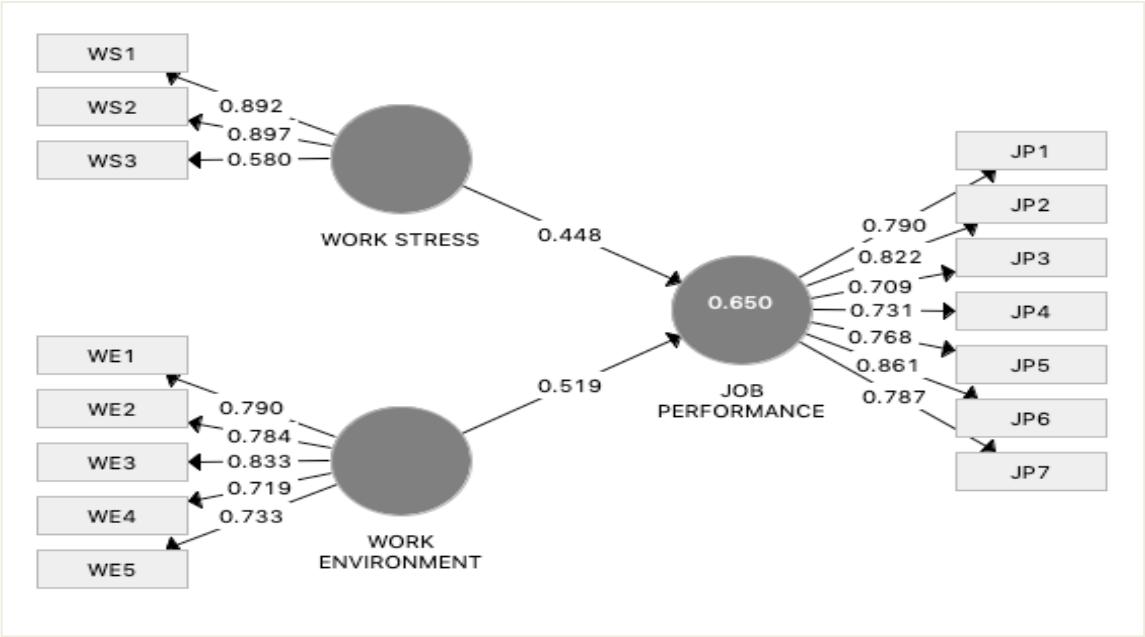
Furthermore, the bootstrapping routine was carried out. This statistical assessment provided compelling evidence of significant positive relationships of the path coefficient between variables under investigation. The significance relationship path analysis outcome explicated the following: work stress (WS) and job performance (JP) causal relationship was found to be β = .448, with a *t*-value of 6.903 and a highly significant $p<.001$. Likewise, the causal relationship between work environment (WE) and job performance (JP) was also positively significant, with a path coefficient of β = .519, a t-value of 9.043, and a $p<.001$ (Cohen, 1988; Hair et al., 2017). These results strongly support the hypotheses H1 and H2, confirming the validity of the proposed structural relationships within the model. Table 5.0 and Figure 2 below exhibit the PLS-SEM analysis outcome for the structural model assessment.

Table 5: Bootstrapping Output – Path Coefficient.

	Original Sample	Sample Mean	Standard Deviation	T-Statistics	P-Values
WS -> JP	.448	.441	.065	6.903	.000
WE -> JP	.519	.524	.057	9.043	.000

Source: SmartPLS output

Figure 2: PLS-SEM analysis output



Additionally, in the evaluation of the overall structural model, the R^2 (coefficient of determination) was assessed to measure the predictive power of the model concerning the endogenous constructs that linked to the exogenous construct. This assessment involved using all data for model estimation to determine the model's predictive power (Ghozali & Latan, 2015; Hair et al., 2017). The R^2 for the relationship between the exogenous and endogenous constructs was found to be convincing at .650, or 65%.

5. Discussion and Conclusion

This study examined the relationship between work stress and job performance within an electronics manufacturing company in Bayan Lepas, Penang. The findings confirm a significant relationship between work stress and job performance, thereby supporting the first hypothesis. These results suggest that reducing workplace stress could positively impact productivity. Factors such as excessive workloads, tight deadlines, and high-risk job conditions contribute to increased work stress, which in turn diminishes employee productivity, as noted by Widayati et al. (2022). This observation contrasts with Puspitasari (2024) study, which indicated that workplace stress negatively affects productivity.

Furthermore, the study explored the second hypothesis concerning the direct relationship between the work environment and job performance. The results indicate a strong, significant correlation between these two variables among employees at the electronics manufacturing company. This finding underscores the role of external factors, such as working conditions, in influencing organizational performance. Employee performance is influenced by intrinsic motivation, skills, and the ability to function effectively within and adapt to challenging environments. Al-Omari and Okasheh (2017) emphasize the importance of these factors, as neglecting them can lead to behavioral issues and poor performance. A positive work environment, including optimal sound conditions and supportive workplace features, has been shown to enhance productivity. Sari et al. (2020) report that a well-designed workspace and recognition from superiors contribute to improved mental health and performance.

In conclusion, the tested hypotheses reveal a statistically significant connection between the examined factors. It is essential to implement improvements comprehensively to enhance workers' performance and job satisfaction. While some challenges may be managed individually, a holistic approach involving systemic changes and managerial interventions can significantly improve both work style and productivity.

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The Association between Social Engagement, Social Network, Social Embeddedness and Quality of Life among University Students

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Abstract: Quality of life (QoL) among university students is a critical concern that impacts not only their academic success but also their overall well-being and prospects. Social relationships are critical for university students' quality of life. Positive social interactions and a supportive network can enhance students' sense of belonging and emotional well-being. However, many students struggle with loneliness and social isolation on campus. This study aims to investigate the association between civic engagement (social engagement, social network, and social embeddedness) and the QoL among university students. We conducted this cross-sectional study among 179 university students on the UiTM Puncak Alam campus via an online survey. We adapted the questionnaire from previous studies and used SPSS version 29 to analyze the data. The Pearson correlation test revealed a link between all the independent variables and the dependent variable, demonstrating both convergent and concurrent validity. The regression analysis showed that social embeddedness was the best predictor of QoL, followed by attitude and behavior. A secure social environment can help one adapt more effectively and provide emotional support, which lowers the risk of depressive symptoms and improves the QoL. In addition, active involvement in social activities helps to increase the sense of belonging to the university community. Identifying oneself as a member of a group of peers, faculty, and staff contributes to the student's self-concept and higher self-esteem, which is vital in terms of psychological health and QoL.

Keywords: *Social Engagement, Social Network, Social Embeddedness, Quality of Life (QoL), University Students*

1. Introduction and Background

The term quality of life (QoL) refers to an intricate and multifaceted concept that is difficult to define, categorize, and analyze. The concept encompasses a range of factors, including social, cultural, economic, political, and environmental dimensions, which pose challenges in terms of identification and quantification (Shin & Jung, 2020). QoL, as defined by the World Health Organisation (WHO) in 2021, is the way an individual sees their living circumstances about their culture and society, taking into account their personal goals and standards. The concept encompasses several aspects of contentment in everyday existence, encompassing life satisfaction, overall well-being, and the experience of happiness (Shin & Jung, 2020). QoL is influenced by multiple factors, such as personal health encompassing physical, mental, and spiritual well-being, relationships, educational attainment, work environment, social standing, wealth, sense of security, freedom, autonomy in decision-making, social connections, and physical environment (Shin & Jung, 2020; Amanfu, 2022; Achangwa et al., 2022).

Civic engagement, which includes social engagement, social networks, and social embeddedness, is one of the elements that contribute to QoL (Sun et al., 2023). It involves how people actively participate in community life to improve the lives of others and create the community's future (Mellet, 2022). Civic involvement activities include community service, membership in environmental organizations, voting, and donating to civic causes (Remr, 2023; Sun et al., 2023). Individuals can make a major difference in their communities by completing these steps and influencing change at the local, regional, and national levels. Scholars such as Rewakowski (2021) and Cui (2022) have emphasized the intimate relationship between civic engagement and QoL.

Civic engagement among university students is crucial to their academic progress, mental health, overall university experience, and QoL. Recent research has emphasized a variety of factors and methods that promote

social engagement, indicating a more advanced understanding of its dynamics and consequences. College students require social involvement because it fosters a sense of belonging and community. BMC Public Health (Chen, Bian, & Zhu, 2023) released a study that found that social support had an indirect impact on academic engagement, with life happiness and academic motivation serving as mediators. Students with strong social networks report higher life satisfaction, which is associated with increased motivation and participation in academic pursuits. These are the anecdotal impacts that a strong social connection between students can have on their academic and overall well-being, suggesting a cause-and-effect relationship that improves resilience to future adversity. Another factor that contributes to boredom in the classroom and lowers academic achievement is social engagement, often known as peer interaction. Students also learn more effectively when they connect with their classmates through collaborative learning in class or group project work, as well as social activities outside of the classroom. Engagement between students and academic staff at an institution improves a variety of outcomes, including dropout rates and course completion. This interchange of ideas and mutual support among students encourages them to thrive in their academics and raises their motivation level (Alalwan, 2022).

Universities serve as centers where students not only gain knowledge but also cultivate vital proficiencies in diverse disciplines (Ahmad et al., 2022). During their time in university, students actively participate in civic engagement, expanding their knowledge of societal matters via both theoretical study and practical application. Nevertheless, it is imperative to study the elements that impact students' engagement in civic activities. In their study, Ahmad et al. (2022) surveyed undergraduate students from three colleges at Universiti Utara Malaysia (UUM) and discovered that a mere 41.2 percent of students actively participate in civic activities. Ahmad et al. (2022) found that students in Malaysia had limited exposure to political participation, which is a crucial national factor contributing to their modest participation in civic engagement. Hence, the objective of this study is to examine the correlation between social engagement, social network, social embeddedness, and quality of life (QoL) among university students.

2. Literature Review

Social Engagement

Social engagement refers to a structured and voluntary activity that seeks to address and identify public concerns. The study by Sun et al. (2023) elucidates how individuals participate in communal endeavors to enhance the well-being of others and foster the future growth of their society. Social involvement encompasses both individual and collective efforts aimed at increasing public awareness of societal challenges, identifying and implementing solutions, and enhancing the overall well-being of society. Community service is a notable form of civic engagement that encompasses activities such as participating in charitable fundraisers. Community service aims to involve individuals in activities that benefit the broader community. However, those who participate in these activities may also derive personal benefits from their involvement (Fenn et al., 2022). Social engagement refers to the collective endeavor of individuals to tackle societal problems, exercise their rights, and contribute to the efficient functioning of their community. Social involvement encompasses several activities such as participating in elections, engaging in political campaigns, protesting or boycotting, volunteering or engaging in community service, practicing pro-environmental behavior, making charitable donations, and providing informal assistance (Wray-Lake et al., 2017).

Doolittle & Faul (2013) categorize social participation into two distinct dimensions: attitudes and behaviors. Attitude refers to an individual's subjective viewpoint and emotions on their involvement in their community and their perception of their capacity to influence that community. The attitudes of university students are influenced by a combination of psychological, social, and environmental elements, which affect their perceptions and behaviors in various situations, including their overall QoL (Chaudhry et al., 2024). As researchers and teachers delve into the complexities of how attitudes are formed and how they affect student learning and growth, there is an urgent requirement for interdisciplinary research and collaborative initiatives to tackle the various issues that modern university students encounter. Universities may foster a more conducive climate for active student engagement in civic activities and cultivate a favorable disposition towards community involvement by addressing these crucial aspects. Attitude is a complex concept that is closely connected to how humans think and behave. It acts as a perspective that shapes how individuals see and engage with the world. Starting from a young age, people start forming attitudes along with other cognitive

and emotional abilities, which shape their perspective on the world and impact how they react to different events and stimuli (Albarracin & Shavitt, 2018). Various elements, such as individual experiences, social interactions, cultural norms, and societal expectations, significantly impact the development of these attitudes (YanJu et al., 2022).

Behavior refers to the way individuals respond or act about external stimuli or within a particular setting. According to the New South Wales (NSW) Health (2020), an individual's behavior is reflected through their activities. Each action is driven by a certain motive and has a distinct underlying cause. Examples of these encompass the use of nonverbal cues such as body language, gestures, facial expressions, and silence to facilitate communication. Additionally, they serve many purposes such as fulfilling demands, capturing attention, eliciting internal or sensory sensations, obtaining access to goods or activities, or evading circumstances. Rahaded et al. (2020) define behavior as the collective accumulation of information, comprehension, mannerisms, values, attitudes, roles, life concepts, and belongings within a group of people. These elements are acquired over generations through collective effort and personal beliefs in the ability to achieve desired outcomes through actions. Moreover, human behavior refers to the capacity to participate in various physical, mental, and social activities during different life phases (Lerner et al., 2024). Like other organisms, humans undergo various stages in their life cycle, each characterized by distinct physical, physiological, and behavioral characteristics. The prevalence of behavioral features, such as mental health concerns, among Malaysian university students is a matter of great concern. According to the World Health Organisation (WHO) in 2021, approximately 14% of individuals between the ages of 10 and 19 experience mental health problems. However, these difficulties often receive inadequate attention and improper care. College students often face significant stress and encounter significant physical and mental challenges due to their demanding academic workload, difficulties in managing their classes, and peer pressure. In recent years, there has been a noticeable increase in mental health problems among students (Radzi et. al., 2022; Wong et al., 2023).

Social Network

According to Del Castillo et al. (2020), social networks are digital platforms that allow users to create personal profiles and share information, fostering engagement with others and connecting with real-life friends, strangers, and relatives. Furthermore, it can offer emotional support, resources, and counsel to people who feel alone in their communities. Social networks also relate to an individual's interpersonal relationships with people in their lives (Kim et al., 2024). Social networks include a wide range of social ties, including personal friends, relatives, neighbors, and casual acquaintances. Individuals can use these connections to easily chat, post, and share information. Bakhshandeh-Bavarsad and Stephens (2024) defined social networks among older individuals as a web of social interactions that include family, friends, and acquaintances and are essential for life satisfaction, mental health, and overall well-being. It is significant because it can help people have happy and rewarding lives as they age.

Social networks influence how people connect, communicate, and share information. They enable people to interact and form relationships that would otherwise be impossible owing to time and distance barriers. Furthermore, social networks have been a prominent focus in computational social science for the majority of the twenty-first century. This branch of study investigates a variety of topics using quantitative approaches, such as machine learning, complexity analysis, major data mining, and simulation modeling (Arya, 2021). These techniques enable researchers to evaluate vast amounts of data created by social network interactions, identify patterns and trends, and create models that can predict future behaviors and results. The earlier study, conducted by Owunna et al. (2022), investigated the association between teens' use of social networking sites. The study's findings indicate a link between increased social network engagement and individuals' desire for social connections, particularly among those who suffer high degrees of loneliness and anxiety. Compared to persons who are less socially anxious, those who are more socially anxious are more likely to prioritize and seek social support online to improve their well-being and receive social acceptability that they would not expect in person (O'Day & Heimberg, 2021).

Social Embeddedness

Social embeddedness (SE) is the type, intensity, and scope of an entity's link to its social context, such as a community (Czernek-Marsza, 2020). This idea classifies relationships into strong, thoroughly integrated links (socially embedded) and weaker, more remote ones (Mikulionienė et al., 2022). Another definition of SE is a broad form of connection to a social unit. Researchers identified two types of embeddedness: relational embedding and structural embedding. Relational embeddedness refers to how well people communicate, depend on, and trust one another in networks, whereas structural embeddedness refers to how interconnected and central network interactions are (Albaram & Lim, 2023).

Schulz et al. (2023) explored how first-year university students may use their classmates as a social resource while seeking academic assistance. The study looks into how SE, specifically the availability of close peer ties, and group awareness, which refers to being aware of peers' knowledge, affect measures of academic performance such as accomplishment, contentment, and dropout intention. According to the study, SE and group awareness make it simpler for students to successfully request academic assistance, which improves their academic performance (Schulz et al., 2023). The findings indicate that SE has little to no impact on academic performance or motivation to drop out. However, SE has an impact on student satisfaction, particularly among engineering students. For engineering students, SE is a prerequisite for effective help-seeking (HS), but this relationship is not mediated by gratifying HS behavior. This means that, while SE promotes HS success and enhances student satisfaction, HS behavior may not be the direct cause of the causal association between SE and satisfaction. Bere's previous research (2019) looked at context-driven use and SE in student adoption of mobile technology in educational settings, with a focus on WhatsApp-mediated interactions. Geographical hurdles, connectivity difficulties, and knowledge gaps among students and educators all had an impact on WhatsApp use. SE evidence includes various perceptions of technology, varying human capacities triggered by its usage, and dissimilar uses compared to developed contexts. It also noted the challenges of successfully integrating mobile technologies into education, including knowledge gaps among peers, teachers, and students, as well as geographical dispersion.

Quality of Life (QoL)

The term QoL denotes the comprehensive condition of welfare encountered by either a populace or an individual at a specific moment in time (Wilzer et al., 2024). According to Gobbi et al. (2023), it refers to a person's assessment of their present situation, which includes their objectives, aspirations, standards, concerns, and dominant ways of life and value systems. This all-encompassing notion encompasses multiple components, including physical and mental well-being, personal convictions, social relationships, and their interplay with important parts of life. Chattu et al. (2020) define QoL as a complex concept that encompasses various aspects, including experiences, states, assessments, actions, capacities, and emotional responses to events. Shin and Jung (2019) suggest that QoL refers to the personal and societal satisfaction experienced in daily living. They argue that QoL includes factors such as life satisfaction, subjective well-being, and overall happiness. Wilzer et al. (2024) suggest that when discussing QoL, it is common to consider factors such as well-being, functioning, life satisfaction, functionality, and interference. These factors refer to the parts of life that contribute to a sense of fulfillment and make life meaningful. The investigation of QoL attracts worldwide attention as a result of growing apprehensions about physical and mental well-being (Pitil et al., 2020). Prior research examining QoL has considered specific variables that are unique to individuals, such as the physical surroundings, contentment with social connections, and encounters with social disputes (Shin & Jung, 2019).

In addition, Alkatheri et al. (2020) observed that students pursuing health sciences, such as medicine, nursing, or allied health professions, are especially prone to experiencing a lower QoL in comparison to the overall population. This observation aligns with prior research, notably, the study conducted by Ramón-Arbués et al. (2022), which similarly identified a decrease in QoL among university students pursuing health-related disciplines. Ghassab-Abdollahi et al. (2020) emphasized the distinct difficulties encountered by these students in their academic education, such as an excessive amount of tasks, rigorous clinical practice requirements during internships, and the expectation of good academic achievement, particularly at public institutions. These factors of stress contribute to a demanding academic setting that can have a substantial effect on students' mental health and general QoL. Research demonstrates the substantial influence of academic stress on students' general well-being, underscoring the importance of addressing stressors to reduce negative consequences and enhance students' QoL. Pitil et al. (2020), Chattu et al. (2020), and Wilzer et al. (2024)

assessed the QoL by employing the World Health Organization Quality of Life-BREF (WHOQOL-BREF) questionnaire. This instrument consists of 26 items that are categorized into four domains: physical health (seven items), psychological health (six items), social relationships (three items), and environmental health (eight items). Furthermore, it encompasses inquiries regarding the entire QoL and overall health. Participants evaluate each item using a five-point ordinal scale, ranging from 1 to 5. They assess a wide range of aspects, including daily activities, medical support, energy levels, mobility, pain levels, sleep patterns, work capacity, personal beliefs, emotions, self-esteem, body image, cognitive abilities, learning capacity, satisfaction with personal and social life, safety, living conditions, possessions, financial adequacy, access to essential services and information, and transportation.

3. Research Methodology

Research Design

The study employed a cross-sectional research design to investigate the relationship between social engagement, social networks, social embeddedness, and QoL among university students in Malaysia. We collected data randomly over 2 months, from May to June 2024, using an online survey (Google Form) from two distinct categories: social sciences students from the Faculty of Business and Management and science and technology students from the Faculty of Pharmacy at UiTM Puncak Alam Campus. The survey recorded a total of 179 respondents.

Instrument

We adapted the questionnaire from the established one, modifying the items to elicit the necessary responses to the research questions. The questionnaire consists of several sections, namely Section A, to request demographic information of respondents such as gender, course, year of study, faculty, and living arrangement. Section B includes items such as social engagement, which consists of 12 items (attitudes and behaviors) (Doolittle & Faul, 2013), social network, which consists of 6 items (Topaloglu et al., 2016), and social embeddedness, which consists of 6-items (Momtaz et al., 2014). Attitude is a personal opinion and feelings that people have about their participation in their community and their sense of ability to change that community, while behaviors have been defined as the steps one takes to actively participate in and improve their community (Doolittle & Faul, 2013). Social networks are a web of social relationships encompassing family, friends, and acquaintances, a fundamental aspect of life satisfaction and overall well-being (Bakhshandeh-Bavarsad & Stephens, 2024), while social embeddedness refers to the nature, intensity, and extent of an entity's connection to its social environment, such as a community. This concept categorizes relationships from strong, deeply integrated connections (socially embedded) to weaker, more distant ties (Mikulionienė et al., 2022). Section C focuses on measuring QoL which was measured using the Quality of Life Scale (QOLS). The QOLS was created originally by American psychologist John Flanagan in the 1970s and has been adapted for use in chronic illness groups (Flanagan, 1978). This form of the QOLS has 16 items rather than the 15 found in the original Flanagan version. Item #16, "Independence, doing for yourself," was added after a qualitative study indicated that the instrument had content validity in chronic illness groups but that it needed an item that reflected the importance to these people of remaining independent and able to care for themselves.

The questionnaire used closed-ended questions with a fixed range of possible answers, as well as a 5-point Likert scale with the following values: 1 = strongly disagree, 2 = disagree, 3 = uncertain, 4 = agree, and 5 = strongly agree to assess the independent variables (social engagement, social network, and social embeddedness) in Section B. The scale used for Section C (QoL) was the 7-point Likert scale (1 = terrible, 2 = unhappy, 3 = mostly dissatisfied, 4 = mixed feeling, 5 = mostly satisfied, 6 = pleased, and 7 = delighted).

Data Analysis

We used statistical software, specifically SPSS version 29, to analyze the collected data. The study uses both descriptive and inferential statistics. The descriptive statistics include the mean and standard deviation. Besides, a linear multiple regression was used to test the effect of social engagement, social network, and social embeddedness on QoL among university students.

4. Results

Profile of Respondents

The data analysis revealed that 91 (50.8%) of the respondents were male and 88 (49.2%) were female and participated in this study. We collected the data from university students at UiTM Puncak Alam Campus, including social sciences students from the Faculty of Business and Management (49.7%) and science and technology students from the Faculty of Pharmacy (50.3%). In terms of living arrangements, or the type of residency, 91 (49.7%) of the respondents resided on campus, while 88 (49.2) were off-campus or non-residential students.

Reliability, Correlation & Regression Analysis

Table 1 presents the results of the reliability and correlation analysis for this study. We derive the reliability results from Cronbach's alphas and present them in parentheses along the diagonal. All variables have Cronbach's alpha values higher than the threshold value of 0.75 as suggested by Kaur and Paruthi (2019), indicating the items are reliable for measuring the intended variables. The Cronbach alpha value ranges from 774 to 962.

According to the study's mean results, the mean score for social attitude is 4.06. It means that most of the respondents agreed that "they felt responsible for the community," "felt confident in helping others who are in difficulty," "believed it is important to be involved in community programs," and "believed that all citizens have a responsibility to their community." The mean score for social behavior is 3.75. The results show that the respondents moderately agreed that "they were involved in volunteering activity in the community," "they helped members of the community," "they participated in discussions that raised issues of social responsibility," and "they contributed to charitable organizations within the community." The mean scores for social networks and social embeddedness are 3.76 and 3.78. The findings revealed that a majority of the participants expressed moderate agreement with the statements, "They perceive social networks/online networks as highly beneficial," "They experience greater comfort on these platforms than in social environments," and "They experience a sense of closeness with their parents, siblings, relatives, and friends, confident in their ability to reach them for assistance." them for help." Aside from that, the mean score for QoL is 5.51. The results showed that universities' QoL levels are moderately satisfactory. Generally, they were satisfied with their basic needs, such as accommodation, food, and financial support; satisfied with their current health condition; satisfied with their learning quality; and satisfied with their relationships with others.

All independent variables showed significant correlations with each other, according to the correlation analysis results. The highest correlation is between attitude and behavior (r =.57, p.01), followed by the relationship between behavior and social embeddedness (r =.375, 01). The social network and social embeddedness have the lowest correlation (r =.257, p.01). When assessing the relationship between independent variables and dependent variables, the results revealed that all independent variables show a relationship with QoL. The relationship between social embeddedness and QoL has the highest correlation (r =.464, p =.01), followed by the relationship between attitude and QoL (r =.458, p =.01), and the relationship between social network and social embeddedness has the lowest correlation (r =.21, p =.01). In this study, the Pearson correlation analysis results show convergent and concurrent validity.

Table 1: Result of Correlation and Reliability Analysis (n=179)

No	Variables	Mean	SD	1	2	3	4	5
1	Attitude	4.06	.587	(.872)				
2	Behavior	3.75	.672	.570**	(.854)			
3	Social Network	3.76	.713	.321**	.360**	(.823)		
4	Social Embeddedness	3.78	.735	.348**	.375**	.257**	(.774)	
5	Quality of Life (QoL)	5.51	.958	.458**	.437**	.210**	.464**	(.962)

Notes: **. Correlation is significant at the 0.01 level (1-tailed); *. Correlation is significant at the 0.05 level (1-tailed); Cronbach's alphas along the diagonal in the parentheses; N=179.

We conducted a multiple regression analysis to identify the factors that influence students' QoL. With an R2 of.336, the regression model is good; it shows that attitude, behavior, social network, and social embeddedness,

which are the independent variables, explain 33.6% of the variation in QoL. The F value of 22.061 is significant, denoting that the data fits the model very well. The root MSE Durbin-Watson coefficient of.984 indicates that the regression model does not have an autocorrelation problem. Looking at the contribution of independent variables in explaining QoL, two independent variables are significant at 0.01 (attitude and social embeddedness), while behavior shows a significant value at 0.05. The strongest predictor that contributes to QoL among respondents is social embeddedness, followed by attitude, and the least factor that contributes to QoL is social behavior. Contrary to expectations, social networks show no significant association with QoL among university students.

Table 2: Summary Results of Regression Analysis (n=179)

Variables	Standardized Beta Values Quality of Life
Attitude	.250**
Behavior	.183*
Social Network	-.017
Social Embeddedness	.313**
R	.580
R^2	.336
Adjusted R^2	.321
F values	22.061
Sig. F values	.000
Root MSE	.984

** Sig. At the 0.01 level, * Sig. At the 0.05 level

Discussion

Based on the findings, the respondents' QoL is moderately high. This suggests that the majority of university students are content with the overall standard of living they experience while on campus. In general, they expressed contentment with material comforts such as housing, nourishment, amenities, and financial stability. They were also content with their physical well-being, feeling physically strong and energetic. Additionally, they reported a moderate level of satisfaction in their relationships with their parents, siblings, and other relatives, specifically in terms of communication, visits, and assistance. They also indicated contentment with their learning experience, attending classes, deepening their comprehension, and gaining extra knowledge. They were also satisfied with their self-awareness, understanding their strengths and shortcomings, and comprehending the fundamental nature of life. The QoL among university students is crucial since it has a substantial impact on their academic achievement, psychological well-being, and general welfare. A favorable QoL, characterized by sufficient availability of resources, social assistance, and chances for individual growth, is linked to improved academic achievement and increased levels of student contentment. In a study conducted by Alharbi and Smith (2018), it was found that students who have a higher QoL exhibit greater resilience and are less prone to experiencing stress and burnout, which are prevalent issues in the university environment. In addition, creating supportive workplaces and ensuring balanced workloads can result in better mental health outcomes, more engagement, and higher retention rates (Nabavi, 2020). Thus, institutions should prioritize enhancing the students' QoL to create a favorable atmosphere for their academic and personal development.

The findings of this study also demonstrated that there is a correlation between social engagement (attitude and behavior) and QoL among the participants. University students greatly benefit from social involvement as it cultivates a feeling of inclusion, improves academic achievement, and positively impacts overall welfare. Participating in social activities and establishing relationships with classmates and professors can result in the formation of supportive networks, which are crucial for successfully navigating the difficulties of university life. Studies indicate that students who actively participate in social activities demonstrate increased levels of academic motivation, improved mental well-being, and a higher probability of completing their education (Astin, 1999). In addition, Tinto (2012) establishes a connection between social involvement and the acquisition of essential soft skills, such as communication, teamwork, and leadership, which are highly advantageous for achieving success in one's future job. Thus, colleges must give priority to the establishment

of opportunities for social involvement, acknowledging its substantial influence on students' academic and personal growth.

Social embeddedness refers to the extent to which an individual is integrated into social networks that provide support, information, and a feeling of belonging. Social embeddedness is of paramount importance for university students, as it significantly impacts their academic success, mental health, and overall well-being. The transition to university life frequently entails substantial alterations in students' social surroundings, rendering the examination of social embeddedness especially pertinent. The study findings demonstrated a significant correlation between social embeddedness and QoL in university students. Smith et al. (2022) conducted a study that found a positive correlation between strong social ties among students and the likelihood of receiving academic support from peers. This support has the potential to improve their learning experiences and outcomes. In a recent study conducted by Lee and Robbins (2023), it was discovered that students who had higher degrees of social embeddedness reported experiencing lower levels of stress and exhibited better mental health results.

5. Conclusion

Multiple variables, such as physical well-being, psychological well-being, interpersonal connections, academic stressors, and financial worries, impact the overall well-being of college students. To tackle these problems, a comprehensive strategy is needed, encompassing institutional backing, mental health provisions, and lifestyle changes. By employing these tactics, universities may optimize the well-being of their students, resulting in enhanced academic achievement, personal growth, and overall life contentment. Universities and students can utilize a range of tactics to improve social interaction. These tactics prioritize the creation of chances for social contacts and the facilitation of students in establishing and sustaining their social networks with other individuals, such as their classmates, lecturers, university personnel, and community members. Active participation in social activities is a crucial element of the university experience, exerting a substantial impact on academic achievement, psychological well-being, and individual growth. Gaining insight into the variables that influence social interaction and employing tactics to amplify it might result in a university experience that is more encouraging and fulfilling for students. As colleges evolve to accommodate shifting social dynamics and technological progress, cultivating robust social networks among students will continue to be a crucial objective.

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Unlocking HR's Hidden Treasure on Innovation Capability: The Mediating Role of Knowledge Management Capacity

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Abstract: Effective innovation is possible when one can innovate. Malaysia has serious problems due to a lack of R&D and innovation skills. Furthermore, small and medium-sized firms (SMEs) in developing nations have received less attention in past research on Malaysian innovation. A quantitative strategy is employed to meet the study's goals. A survey approach is used to collect data from the owners, chief executives, and management of ICT SMEs. The research collected and analyzed a total of 200 respondents. The research models and hypotheses were assessed using the Partial Least Squares (PLS) technique. This research comprises the difference between Innovative Centric Human Resource Management (ICHRM) (Acquisition; Development; Egalitarian; Collaborative; Documentation, Information System) and Innovation Capability (Radical; Incremental), also the relationship between ICHRM and Innovation Capability, using Knowledge Management Capacity as a mediator. Based on the findings of this study, the majority of HRM practices are suitable for SMEs' incremental innovation capabilities. This study also presents empirical evidence of the impact of ICHRM on knowledge management capacity on innovation, focusing on the impact of each dimension in ICHRM components that were linked to organizational processes, with a focus on the influence on incremental and radical innovation.

Keywords: *ICHRM, Development, Egalitarian, Collaborative; Documentation, Information System, Innovation Capability, SMEs*

1. Introduction and Background

Innovation is considered a vital factor in advancing Malaysia toward achieving developed nation status with a high-income classification (Inovasi Malaysia, 2022). The presence of innovative and competitive SMEs is essential for the success and future advancement of nations, particularly Malaysia (Cakar & Erturk 2010). Due to the essential nature of innovation for a firm's existence and development, possessing innovation capabilities has become increasingly vital (Francis & Bessant, 2005). Companies with enhanced innovation capabilities are likely to be more adept at managing innovation than their competitors and more effective in capitalizing on new ideas (Francis & Bessant, 2005).

Innovation is a crucial element for Malaysia to achieve developed nation status and a high level of living by 2020. (Hilmi, Pawanchik, Mustapha, & Mahmud, 2012; Sulaiman, Muhamad, & Sanusi, 2012). The future prosperity and expansion of Malaysia hinge on the presence of creative and competitive small and medium-sized enterprises (SMEs) (Cakar & Erturk, 2010). For a company to prosper and expand, enhancing its capacity for innovation is becoming increasingly essential (Francis & Bessant 2005). A corporation with a high degree of innovation aptitude is likely to manage and implement new ideas more effectively than its competitors (Francis & Bessant 2005).

The critical factor in maximizing innovation is the necessity of a creative idea or vision, whether it pertains to new business processes, organizational changes, or modifications in products and services. Innovation serves both the user's and the business's interests. Comprehending innovation typically involves a certain level of imagination, albeit not all innovations require it. Innovative developers implement creative ideas to effectuate definite and substantial changes in the area of innovation inside an organization (Hertog, Aa & Jong, 2010). Small and medium-sized enterprises (SMEs) encounter difficulties in attracting and retaining human resources; therefore, the success of SME-ICT firms in Malaysia necessitates the efficient management of human resources essential for facilitating technology and knowledge transfers, ultimately fostering the growth of Malaysian ICT SMEs. Furthermore, the function of market sensing as a moderator is crucial, as it is essential to answer client expectations. Innovation, knowledge management, and human resource management challenges are critical in

the context of SME-ICT Malaysia. This indicates the necessity for a comprehensive examination of the relationship among HRM, knowledge, and innovation in SME-ICT Malaysia.

Numerous studies acknowledge the pivotal function of ICT in enhancing the corporate environment by generating exceptional chances for growth, job expansion, and innovation acceleration. Few SMEs are fully harnessing the potential of digitalization. The paper 'Accelerating Malaysian Digital SMEs: Escaping the Computerization Trap', produced by SME Corp, examined the present state of innovation within the Malaysian SME sector and determined that the majority have only minimally engaged with technology as a catalyst for growth. The growth and success of small and medium-sized enterprises (SMEs) are crucial in today's global ICT landscape, irrespective of economic conditions (Abdullah & Beal, 2003). Small and medium-sized enterprises (SMEs) throughout the information and communication technology industry, especially in Malaysia, encounter intense competition and a dynamic worldwide market. They must continually pursue novel methods to enhance their capacity for innovation to achieve sustained growth and improved company success. Calantone, Cavusgil, and Zhao (2002) assert that a company's innovative capacity is essential for its competitiveness and performance, but Hurley and Hult (1998) and Terziovski (2008) contend that innovation competence is a vital component of successful innovation.

SMEs need to generate exceptional new goods or services to use emerging technologies (Hadjimanolis 1999). Small and medium-sized firms (SMEs) have a historical record of innovation despite constrained resources (Rosenbusch, Brinckmann & Bausch 2011). Companies' competitiveness and economic performance decline when their potential for innovation fails to expand and be maintained (Capaldo, Landoli, Raffa & Zollo 2003). Therefore, a company's capacity for innovation must be enhanced to remain competitive in the marketplace.

In the global information and communications technology (ICT) landscape (Abdullah & Beal, 2003), small and medium-sized enterprises (SMEs) are regarded as vital to the economic well-being of any nation, including Malaysia. Small and medium-sized enterprises in the ICT sector, especially in Malaysia, encounter heightened rivalry and a dynamic business landscape as a result of globalization. To achieve sustained development and enhanced business performance, they must continually explore new methods to enhance their capacity for effective innovation. Calantone, Cavusgil, and Zhao (2002) and Hurley and Hult (1998) assert that innovation and the capacity to innovate are the paramount aspects influencing an organization's competitiveness.

To compensate for the decline of conventional revenue streams, firms used digital initiatives. A corporation that fails to adopt digital practices is unlikely to survive, let alone prosper. Small and medium-sized enterprises (SMEs) constitute 99 percent of Malaysia's 920,624 firms. In 2018, small and medium-sized firms (SMEs) comprised 66.2 percent of Malaysia's workforce and contributed RM522.1 billion, representing 38.3 percent of the nation's GDP. Small and medium-sized enterprises can be categorized into micro, small, and medium classifications based on their industry, revenue, and employee count. Seventy-six-point-five percent of Malaysian SMEs are classified as micro-enterprises. Conversely, merely 2.3% of SMEs qualify as medium-sized enterprises (Amos & Rachel, 2020).

Human resource functions have already been examined concerning knowledge management competence (Lengnick-Hall et al., 2009). Research predominantly centers on Human Resource (HR) tasks that emphasize innovation, specifically recruiting, selection, and performance evaluation. However, there seems to be insufficient study about the influence of HR functions within the framework of Innovation Centric HR on knowledge management and innovation. This research will analyze two forms of innovation: radical and incremental. This study seeks to address the existing gap in the literature through investigation. Therefore, the objective of this thesis is to examine the relationship between the human resource management of Malaysian ICT SMEs and their capacity to manage knowledge. Also, This study investigates innovative-focused HRM practices and knowledge management capabilities, which have not been extensively explored in Malaysian ICT SMEs.

2. Literature Review

HRM Practices and Knowledge Management Capacity

Acquisition through the creation, sharing, and implementation of radical new concepts, HRM practices help businesses enhance their ability to manage knowledge (Baer, 2007, Kang, et al., 2007). Organizations have access to a wider range of information and resources the more diversified the external networks that people have built, which broadens their understanding of the most recent institutional and technological developments. Collaborative HRM practices improve knowledge acquisition, knowledge sharing, and application by promoting better teamwork and collaboration among stakeholders (Youndt and Snell, 2004). Unrestricted HRM practices that eliminate hierarchical differences in the organization have been found to encourage employees to acquire, share, and apply knowledge.

Employee knowledge acquisition, sharing, and application are supported by HRM practices by requiring employees to create and populate knowledge storage devices such as information systems, manuals, and standard operating procedures (Davenport & Prusak, 1998). Using information technology infrastructure, technological HRM practices aid in the codification, capture, and management of organizational knowledge (Youndt & Snell, 2004). In this case, various technologies such as online databases, groupware, data warehouses, and information processing software help a company's KM function (Kamhawi, 2010).

Therefore, the relationship between a firm's HRM practices and knowledge management appears to be straightforward, as existing literature provides compelling evidence that innovation-centric HRM approaches directly impact knowledge management capabilities. Thus, the following hypotheses are proposed:
H1: *The Acquisition HRM practices directly and positively influence its Knowledge Management Capacity.*
H2: *The Development of HRM practices directly and positively influences its Knowledge Management Capacity.*
H3: *The Egalitarian HRM practices directly and positively influence its Knowledge Management Capacity.*
H4: *The Collaboration HRM practices directly and positively influence its Knowledge Management Capacity.*
H5: *The Documentation HRM practices directly and positively influence its Knowledge Management Capacity.*
H6: *The Information HRM practices directly and positively influence its Knowledge Management Capacity.*

Mediating Relationships between Constructs

Human Resource Practices, Knowledge Management Capacity and Radical Innovative Capability

According to Damodaran and Olphert (2010), knowledge management systems (KMS) are defined as "information systems that are believed to enhance organizational learning by capturing both content and process knowledge and making this knowledge accessible to all employees." As stated by Abubakar et al. (2017), "Knowledge Management encompasses various components, including human resource practices, technology, culture, and organizational structures; hence, it represents a systematic approach to optimizing a firm's knowledge economy and fostering innovations" (pg.13). The deployment of KMS encompasses not only technological aspects but also human factors (Shrafat, 2018). This may be interpreted as knowledge-based human resource management strategies enhancing the rate of radical innovation adoption. The implementation of radical innovations should also influence the profundity of organizational knowledge. An increased number of professionals facilitates the comprehension of novel technical concepts and the formulation of methods for their implementation. This approach, however, presupposes that the professionals are sufficiently concentrated to facilitate effective communication among themselves. The concentration fosters a greenhouse effect for the cultivation and sustenance of innovative ideas, particularly when these ideas signify substantial alterations in the conceptualization of a manufacturing process.

They asserted that a proactive strategy enhances industry performance by fostering flexibility, innovation, improved opportunity recognition, and superior foresight of market fluctuations. Abernathy and Clark (1985) delineated the difference between gradual and radical innovation. Radical innovations are characterized by a significant divergence from current technical pathways. The extent of technological novelty—a novelty to enterprises, the industry, and the consumer—dictates whether an innovation is classified as radical. The corporation can utilize the knowledge that affects the nature of innovation generated, whether gradual or drastic (Subramaniam & Youndt, 2005). The research serves as a significant reference in this study, as it is among the limited empirical investigations that assess inventive capability. In conclusion, the examined

literature indicates that both radical and incremental inventive capacities are established notions that warrant additional examination due to their significant business ramifications. The inquiry into how organizational knowledge might yield varying outcomes in radical or incremental innovation remains unresolved.

It is essential to highlight that knowledge inside organizations resides with employees. The subsequent section will explore the topic of human resource management (HRM), which focuses on the management of employees inside organizations. This conversation aims to explore how Human Resource Management might affect an organization's capacity for innovation. In organizations, "knowledge management" (KM) denotes a strategy for effectively utilizing individuals' knowledge and experience to generate value (Scarborough, 2003). The resource-based theory of the organization is often cited as a primary reference in numerous KM studies, including those by Chen and Huang (2009) and Seleim and Khalil (2007), which acknowledge knowledge as a vital organizational resource (Nonaka & Takeuchi, 1995). In addition to the resource-based theory, knowledge management academics sometimes reference the firm's knowledge-based theory.

The knowledge-based theory of the firm posits that organizations function as systems for the development, utilization, and dissemination of knowledge, with positive performance reliant on their capacity to process knowledge (Seleim & Khalil, 2007). The resource-based theory posits that organizations get advantages from distinctive resources, but the knowledge-based theory extends this notion by asserting that knowledge is the paramount organizational resource (Nonaka & Takeuchi, 1995).

The knowledge-based theory is an addition to the resource-based theory of the company (Seleim & Khalil, 2007; Nonaka & Takeuchi, 1995). In conclusion, the firm's resource-based and knowledge-based theories assert that innovation is closely associated with 2 organizational resources: knowledge and employees, which serve as fundamental repositories of information. Knowledge is a major asset essential for attaining competitive advantage in organizations, as it fulfills the criteria of being rare, valuable, distinctive, and inimitable (de Pablos, 2004). Multiple studies have demonstrated that HRM strategies can be employed to acquire and retain human resources possessing unique and hard-to-replicate attributes, subsequently enhancing their competencies into organizational capabilities that generate sustainable competitive advantage for organizations. Consequently, in this investigation of organizational innovation, the theories function as foundational principles.

Nonetheless, despite the substantial contributions of both resource-based and knowledge-based models of the company, academics caution that evidence indicates organizational resources alone may not inherently provide competitive benefits to organizations (Ray, Barney & Muhanna, 2004). Employees and knowledge must be cultivated, underpinned by management processes, and utilized to attain specified objectives that confer a competitive advantage to the organization. To improve the organization's innovation performance, they need to be effectively managed.

This research aims to thoroughly document the resources and organizational procedures that facilitate innovation in companies. This section examines how social ties and learning processes within organizations facilitate innovation. Knowledge Management Capability (KMC) is typically defined as the organization's capacity to generate, disseminate, and utilize knowledge resources to produce principles of competitive advantage. KMC allows organizations to discover, analyze, and manage necessary and available knowledge to enhance knowledge resources and attain organizational objectives (Chawla & Joshi, 2010). Most scholars concur that KMC encompasses the processes of acquiring, sharing, and applying knowledge (Chen & Huang, 2009). Knowledge acquisition pertains to a firm's capacity to seek and obtain new information and knowledge from pre-existing knowledge. Also, Knowledge sharing is the process by which people share their knowledge and experience to improve and produce insightful new ideas (Liao & Wu, 2009).

Numerous research has substantiated the correlation between knowledge management capability and innovation aptitude. Le and Lei (2019) assert that a firm's capacity for innovation is significantly contingent upon its proficiency in knowledge transformation and implementation. Innovation is not the only focus of knowledge management; it also creates an atmosphere that encourages innovation. Ling and Nasurdin (2010) assert that good knowledge management enhances a firm's organizational capacity for innovation by perpetually evolving its administrative processes, information systems, and organizational structure into

innovative frameworks. Costa and Monteiro (2016) assert that knowledge management capability substantially enhances innovation by transforming tacit knowledge to explicit knowledge, also improving the capacity to identify knowledge gaps, subsequently making this knowledge available and accessible. Costa and Monteiro (2016) evidenced the substantial impact of knowledge management capability on diverse types of innovation through a rigorous analysis of 45 seminal works. KMC enables organizations to deliberately control knowledge inflows and outflows, facilitating the effective execution of external exploitation and internal innovation. Naqshbandi and Jasimuddin (2018) found that Knowledge Management Capabilities (KMC) enhance and expedite the acquisition and application of knowledge, hence augmenting the innovation capacity of 172 French enterprises.

Recent research indicates that the primary factors influencing an organization's innovation processes are the acquisition, diffusion, and application of knowledge resources (Le & Lei, 2019). Additionally, regarding the relationship between KMC and ambidextrous innovation, Andriopoulos and Lewis (2009) asserted that KMC enables organizations to leverage existing knowledge and experiences for incremental innovation while simultaneously enhancing their capacity to explore new knowledge to promote radical innovation. Organizations with a higher KMC are anticipated to exhibit greater efficiency in striking a balance between exploitative and exploratory technological innovations in an ambidextrous manner. The findings indicated that KMC has a positive correlation with exploitative practices and ERIs. Despite the acknowledged positive link between Knowledge Management Capability(KMC) and innovation, empirical research examining the relationship between KMC, and several facets of innovation remains insufficient.

H7: *The KMC Mediates the Relationship between Acquisition and Radical Innovation Capability.*
H8: *The KMC Mediates the Relationship between Development and Radical Innovation Capability.*
H9: *KMC Mediates the relationship between Egalitarian and Radical Innovation Capability.*
H10: *The KMC Mediates the Relationship between Collaboration and Radical Innovation Capability.*
H11: *The KMC Mediates the relationship between Documentation and Radical Innovation Capability.*
H12: *The KMC Mediates the Relationship between Information and Radical Innovation Capability*

Human Resource Practices, Knowledge Management Capacity and Incremental Innovative Capability

Businesses have recognized the importance of knowledge management (KM) due to its capacity to facilitate innovation through effective knowledge utilization. Numerous multinational enterprises (MNEs) are currently using Knowledge Management (KM) to optimize the value of the knowledge possessed by their existing and prospective customers and shareholders. Lichtenthaler (2017) posits that a company's ability to acquire, retain, and utilize knowledge in open innovation is most accurately characterized by the notion of organizational learning. Collaboration, innovative initiatives, and efficient knowledge management frameworks are crucial for multinational enterprise innovation endeavors. Both internally and externally, a company's innovative concepts can proliferate rapidly due to the dissemination of information across several locations. A company's knowledge management practice encompasses a range.

Knowledge management capacity is crucial for innovation as it identifies knowledge deficiencies, amalgamates internal and external knowledge, and enhances its availability and accessibility for the innovation practice (du Plessis, 2007). Multinational enterprises can enhance their innovative endeavors by adopting the open innovation paradigm, which involves obtaining external knowledge and utilizing external channels for the commercialization of new insights. A benefit of knowledge management is that it enhances the organization's open innovation initiatives. Tan and Nasurdin (2011) assert that knowledge management capacity functions not only as a prelude to organizational innovation but also as an intermediary mechanism linking organizational elements, such as human resource management practices, to innovation outcomes. These authors assert that HRM strategies empower organizations to improve employees' capacity to generate expertise in their field and maximize the influence of group knowledge on organizational innovation. This study aims to elucidate the mediation mechanism by which knowledge management capacity influences the effects of Human Resource Management (HRM) practices on exploitative and Employee Retention Intention (ERI) behaviors, thereby addressing existing research gaps.

An organization's knowledge management capacity denotes the degree to which knowledge resources are generated, disseminated, and utilized across functional boundaries. The KM capability is dynamic, allowing organizations to manage their knowledge bases by reorganizing and realigning the processes of knowledge

exploration, retention, and exploitation both internally and externally (Lichtenthaler & Lichtenthaler, 2009). The pace of invention is exceedingly rapid, and the intense battle for market share is escalating daily. Innovators, business executives, and specialists often concentrate on developing groundbreaking breakthroughs to generate new markets and categories for technologies, products, and services, thereby securing a substantial advantage over competitors. Although this is accurate, the significance of incremental innovation must not be disregarded. The market impact can be substantial, even if it is not immediately evident or quantifiable at the time of introduction. Therefore, this research posits that:

H13: *The KMC mediates the relationship between Acquisition and Incremental Innovative Capability.*
H14: *The KMC mediates the relationship between Development and Incremental Innovative Capability.*
H15: *The KMC mediates the relationship between Egalitarian and Incremental Innovative Capability.*
H16: *The KMC mediates the relationship between Collaboration and Incremental Innovative Capability.*
H17: *The KMC mediates the Relationship between Documentation and Incremental Innovative Capability.*
H18: *The KMC mediates the relationship between Information and Incremental Innovative Capability.*

3. Methodology

Research Design

This research aims to investigate how factors correlate to one another (constructs), such as distributive human resource practices, KM, and organizational innovation, quantitative research is appropriate. The variables were measured with a research instrument, and the data gathered was then analyzed statistically (IBM SPSS Statistics and PLS-SEM). In terms of data collection, a survey was used because it is associated with the deductive approach and has been cited as one of the most prominent data collection strategies in business-related research (Sekaran & Bougie, 2010). The survey is appropriate because many respondents were needed for this study, and it is highly economical practically.

Population and Sample

This study approach is supported by research findings which have found that subjective self-reports, in terms of organization perception employee perception of their organizational practices. As such, to understand the HR practices for knowledge flow and innovation from the perspective of individual employees, an organization the research population identified all SME-ICT in Malaysia.

Sampling Design

SME Corp., Malaysia provided a list of companies from which to sample for this thesis. As the secretariat for the National SME Development Council (NSDC), SME Corp serves as the primary source of information and advice for all Malaysian small and medium enterprises (SMEs). An alphabetical list of small and medium-sized enterprises (SMEs) is available on the website. It was necessary to obtain the list of businesses included in the ICT sector for this investigation. At the time of access in August 2020, there were 500 companies on the list, which served as a population frame. Businesses in Malaysia's Greater Kuala Lumpur/Klang Valley region, which includes the city of Kuala Lumpur as well as its surrounding suburbs, cities, and towns in the state of Selangor, were selected.

Survey Instruments

The survey questionnaire for this study was created by modifying and compiling a number of survey instruments that had been used by other researchers in the past. As indicated in Table 1, the study's questionnaire was modified from previous research.

Table 1: Survey Items

	Constructs	Dimensions	Sources of Measurement Scales	Adopt/Adapt	No of items
1	Innovative capability	Incremental innovative capability	Subramaniam & Youndt (2005)	Adapt	3
		Radical innovative capability			4
2	Knowledge management capacity	Knowledge management capacity	Chen & Huang (2009)	Adapt	7

3	Innovative-centric HRM practices	Acquisition HR Egalitarian HR Documentation HR Information System HR Collaborative HR Development HR	Youndt & Snell (2004) Kang, Morris, & Snell (2007)	Adapt	34

Data Analysis

This paper suggests that a partial least squares (PLS) technique is frequently more appropriate when there is a relatively fresh or evolving model, or when the theoretical model or measurements are not well-formed (Chin & Newsted,1999). Partial Least Square (PLS) has gained attention among behavioral researchers to explore a new theory or research model in the studies.

4. Results and Discussion

Demographic

The research population comprised SMEs from the ICT sector in Malaysia. Data were collected from the SMEs in Selangor, the Federal Territory, Cyberjaya, and Putrajaya. The minimum sample size for this study is 160, as determined by the G-Power analysis. This study successfully gathered 200 replies following data collection. This thesis was derived from a list of companies on the SME Corp, Malaysia website. SME Corp serves as the secretariat for the National SME Development Council (NSDC) and acts as the primary source of information and consulting services for all SMEs in Malaysia. The website offers an alphabetical listing of SMEs categorized by several industry groupings. The list of firms in the ICT industrial sector was obtained for this research. In December 2020, the access point had a list of 6,594 companies, serving as the population frame. The demographic information of the respondents included gender, age, educational attainment, work position, tenure, and the number of employees in the SME company.

Table 2 indicates that there were 110 male respondents, constituting 55 percent, and 90 female respondents, representing 45 percent. The respondents' ages varied, with the predominant group being 36 to 45 years old (49.8 percent), followed by 25 to 35 years old (29.9 percent) and 46 to 55 years old (15.4 percent). Only 8 employees were above 55 years old, constituting 4.0 percent, while those under 25 years old represented 1 percent. Most respondents possess a degree (85.0 percent), a diploma (7 percent), or a master's degree (8 percent). The employees represented four distinct job levels. Most respondents possess a degree (85.0 percent), a diploma (7 percent), or a master's degree (8 percent). The workforce comprised four managerial job levels (85.5 percent), management/director positions (8.9 percent), the owner (4.0 percent), and top executives (5 percent). The duration of services is categorized as follows: 5 to 10 years (73.5 percent), 3 to 5 years (19.0 percent), less than one year (5.0 percent), and more than 10 years (2.5 percent). The employee distribution across 200 organizations was as follows: more than 75 employees (71 percent), 10 to 30 employees (12.5 percent), 30 to 60 employees (10 percent), and fewer than 10 employees (6.0 percent).

Table 2: Demographic factors

Demographic Profile		Frequency	Percentage
Gender	Male	110	55.00
	Female	90	45.00
Age	below 25 years old	2	1.0
	25-35 years old	60	29.9
	36-45 years old	100	49.8
	46-55 years	31	15.4
	More than 55 years	8	4.0

Level of Education	Diploma Degree	14	7.0
	Master	170	85.0
		16	8.0
Job Level	Owner Top	8	4.0
	Management/Direct or	5	2.5
	Managerial	16	8.0
		171	85.5
How long have you been in the organization	Less than 1 year 3-5 years	10	5.0
	5-10 years	38	19.0
	More than 10 years	147	73.5
		5.	2.5
How many employees are in your company organization	Less than 10	12.0	6.0
	10-30	25	12.5
	30-60	21	10.0
	More than 75	142	71.0

Data Screening

Missing Data

There were 10 variables including six independent variables, two dependent variables 1 mediating variable, and 1 moderating variable. Overall, the total items for 10 variables were 48 items. The number of cases was 200 cases, and the total value was 7600. Therefore, there were no missing values in this study.

Outliers

In assessing the outliers, Mahalanobis distance is one measure of that multivariate distance. The values, then there are issues with the outliers. The findings showed that the Mahalanobis distance values (D2) ranged from a minimum of 0.364 to a high of 12.403. D2 values for 21 of the cases were evaluated, and the results showed that the report contained multivariate outliers. Thus two-one of the data was deleted. As a result, there was no outlier, as the highest Mahalanobis value decreased from 24.93 to 12.403.

Common Method Bias (CMB)

For this study, since the total variance explained was 6.39 percent, which is less than 50 percent, it can be concluded that there were no issues with common method variance in this study.

Descriptive Statistic

This study conducted a descriptive analysis that included mean, standard deviation, minimum, maximum, kurtosis, and skewness for each dimension. In the realm of egalitarianism, the least answer value was 1.0, while the maximum was 5.0. The mean value is 3.741, and the standard deviation is 0.688, indicating a high level of egalitarian behavior among the respondents in this study. The five elements of egalitarian exhibited a skewness of -0.429 and a kurtosis of 1.211. Kline (2011) states that the appropriate range of normalcy is characterized by skewness values below 3 and kurtosis values below 10. Therefore, this signifies that the data for this investigation was normally distributed.

The minimal value for collaboration was 1.25 and the maximum value was 5.0. The mean value was 3.917, and the standard deviation was 0.643, indicating a high level of collaborative practice among the respondents in this study. The eight components of collaboration exhibited a skewness of -0.936 and a kurtosis of 2.866, indicating that the data for this study was normally distributed.

The lowest value for the development of HRM practice was 1.00, while the highest value was 5.00. The mean value was 3.936, and the standard deviation was 0.667, indicating a high level of HRM practice growth among the respondents in this study. The eight components of HRM development exhibited a skewness of -0.936 and a kurtosis of 2.866, indicating that the data for this study was normally distributed.

The lowest value for the documentation of HRM practice was 1.00, while the maximum value was 5.00. The mean score was 4.018, and the standard deviation was 0.692, indicating a high level of HRM practice growth

among the respondents in this survey. The four components of HRM development exhibited a skewness of -1.236 and a kurtosis of 3.556, indicating that the data for this study was normally distributed.

The subsequent step was the descriptive analysis of the information system. The minimum value for information system practice was 1.00, while the maximum value was 5.00. The mean value was 3.75, and the standard deviation was 0.692, indicating a high level of information system practice among the respondents in this survey. The four components of the information system revealed a skewness of -0.723 and a kurtosis of 1.829, indicating that the data for this investigation was normally distributed.

The four acquisition elements reveal that the least acquisition practice value was 1.00, while the maximum value was 5.00. The mean value was 3.59, and the standard deviation was 0.648, indicating a high level of information system practice among the respondents in this study. In the four acquisition items, the skewness was -0.641 and the kurtosis was 1.576, indicating that the data for this study was normally distributed.

The six components of knowledge management capacity demonstrate that the minimal value for its practice was 1.00, while the highest value was 5.00. The mean value was 3.89, and the standard deviation was 0.659, indicating a high degree of knowledge management capability practice among the respondents in this study. In the six acquisition items, the skewness was -0.987 and the kurtosis was 3.136, indicating that the data for this study was normally distributed.

The three components of incremental innovation capabilities demonstrate that the minimal value for its practice was 1.00, while the highest value was 5.00. The mean score was 3.69, and the standard deviation was 0.791, indicating a high level of incremental innovation capability among the respondents in this study. The three market sense capability items had a skewness of -0.443 and a kurtosis of 0.280, indicating that the data for this study was normally distributed. The minimal value for radical innovation capabilities practice was 1.00, while the maximum value was 5.00. The mean score was 4.07, and the standard deviation was 0.805, indicating a high level of incremental innovation capability among the respondents in this study. The three market sense capability items had a skewness of -1.410 and a kurtosis of 3.479, indicating that the data for this study was normally distributed.

Assessment of Measurement Model

Factor Loading for Endogenous Constructs

According to Hair et al. (2014), To be regarded as having high internal consistency reliability, the loading needs to be more than 0.7. To extract the average variance with a minimum value of 0.50 and greater than 0.7, the item should be removed from the construct if the loading is less than the threshold value. The result for PLS revealed that all of the 48 items have a high factor loading with values that are greater than 0.5 and above 0.7.

The evaluation of composite reliability (CR) was conducted to ascertain dependability following the removal of components. Hair et al. (2014) assert that composite reliability should exceed 0.70, and the average variance extracted should be above 0.50 to ensure excellent internal consistency reliability and validity. Table 3 demonstrated the composite validity for the following values: acquisition (0.81), collaboration (0.902), development (0.889), documentation (0.851), egalitarian (0.881), information system (0.839), incremental innovation capability (0.846), knowledge management capability (0.902), and radical innovation capability (0.891). All indicators exhibit strong internal consistency values exceeding 0.7 for the evaluation of composite dependability. The findings validated the reliability of the 51 items.

Table 3: Assessment of measurement model

Construct	Number of Items	Item Deleted	Loadings for Retained Items	Composite Reliability	Average Variance Extracted (AVE)
1. Egalitarian	5	EGA1	0.577	0.881	0.601
		EGA2	0.700		
		EGA3	0.857		
		EGA4	0.844		
		EGA5	0.857		

2. Collaborative	8	COLAB1	0.718	0.902	0.536
		COLAB2	0.718		
		COLAB3	0.782		
		COLAB4	0.735		
		COLAB5	0.809		
		COLAB6	0.638		
		COLAB7	0.705		
		COLAB8	0.776		
3. Documentation of HRM Practice	4	DOCU1	0.711	0.851	0.588
		DOCU2	0.798		
		DOCU3	0.828		
		DOCU4	0.725		

The evaluation of average variance extracted (AVE) was conducted to ascertain reliability following the removal of components. Hair et al. (2014) assert that the variance extracted must exceed 0.50 to ensure excellent internal consistency reliability and validity. The composite validity for the values of acquisition (0.519), collaboration (0.536), development (0.538), documentation (0.588), egalitarian (0.601), information system (0.571), incremental innovation capability (0.647), knowledge management capability (0.571), and radical innovation capability (0.673) is presented. All indicators exhibit strong internal consistency values exceeding 0.7 for the evaluation of composite dependability. The findings validated the reliability of the items.

Table 4: Assessment of measurement model (continued)

Construct	Number of Items	Item Deleted	Loadings for Retained Items		Composite Reliability	Average Variance Extracted (AVE)
4. Development of HRM Practice	8	DEVELOP2	DEVELOP1	0.545	0.889	0.538
			DEVELOP3	0.74		
			DEVELOP4	0.81		
			DEVELOP5	0.746		
			DEVELOP6	0.822		
			DEVELOP7	0.66		
			DEVELOP8	0.774		
5. Information System	4		INFO1	0.748	0.839	0.571
			INFO2	0.866		
			INFO3	0.815		
			INFO4	0.557		
6. Acquisition	4		ACQU1	0.740	0.81	0.519
			ACQU2	0.816		
			ACQU3	0.723		
			ACQU4	0.583		

Table 5: Assessment of measurement model (continued)

Construct	Number of Items	Item Deleted	Loadings for Retained Items		Composite Reliability	Average Variance Extracted (AVE)
7. Knowledge Management Capacity	7		KMC1	0.669	0.902	0.571
			KMC2	0.828		
			KMC3	0.799		
			KMC4	0.818		
			KMC5	0.674		
			KMC6	0.780		
			KMC7	0.701		

8. Radical Innovative Capability	4	RADIC1	0.871	0.891	0.673
		RADIC2	0.805		
		RADIC3	0.899		
		RADIC4	0.691		
9. Incremental Innovative Capability	4	INNOC1	0.835	0.846	0.647
		INNOC2	0.728		
		INNOC3	0.846		

Discriminant Validity

Additional analysis was conducted to ascertain the discriminant validity. The Fornell and Larcker criterion was employed to assess the cross-loadings among the other constructs (Fornell & Larcker, 1981). Table 6 indicates that the cross-loadings of the construct exceed those of the other constructions, hence satisfying the requisite assumption. The cross-loadings of all objects in the reflecting model range from 0.695 to 0.839. Consequently, this outcome indicates that no item was loaded more significantly on constructs that were not intended for measurement.

Table 6: Discriminant model

Constructs	1	2	3	4	5	6	7	8	9	10
1. Acquisition	**0.721**									
2. Collaboration	0.717	**0.732**								
3. Development	0.627	0.698	**0.734**							
4. Documentation	0.600	0.668	0.717	**0.767**						
5. Egalitarian	0.622	0.743	0.55	0.592	**0.775**					
6. Information System	0.711	0.702	0.681	0.753	0.593	**0.756**				
7. Incremental Innovation Capability	0.603	0.622	0.718	0.503	0.522	0.608	**0.804**			
8. Knowledge Management Capability	0.634	0.864	0.62	0.625	0.944	0.626	0.571	**0.755**		
9. Radical Innovation Capability	0.536	0.596	0.929	0.652	0.468	0.577	0.457	0.527	0.597	**0.82**

Assessment of Structural Model (Hypotheses Testing)

R Square

The R^2 values of the incremental innovation capability are 0.589 (58.9%), radical innovation capability was 0.873 (87.3%), and knowledge management capability 0.956 (95.6 %), which suggested highly explained by eight exogenous constructs of acquisition, collaboration, development, documentation, egalitarian, information system, and knowledge management capability.

Direct Relationship Human Resources Practice with Knowledge Management Capacity

Correlation between human resources and knowledge management capacity in terms of collaboration (β= 0.446), development (β= 0.029), and egalitarianism (β= 0.675). The path coefficient was negative for acquisition (β= -0.091), documentation (β= -0.017), and information system (β= -0.029), whereas it was positive for knowledge management capacity (β= 0.424) and market sense capability (β= 0.765). The subsequent stage is to ascertain the significance of the link. Bootstrapping is necessary for each data collection, necessitating a minimum of 500 samples. The p-value and t-value must be below 0.05 ($p < 0.05$) to accept the hypotheses on the link. The subsequent stage is to ascertain the significance of the link.

Each data set necessitates bootstrapping, which requires a minimum of 500 samples. The p-value and t-value must be below 0.05 ($p < 0.05$) to accept the hypotheses on the link. The findings indicate that acquisition

(t=2.603, p <0.05), collaboration (t=10.61, p <0.05), and egalitarianism (t=16.03, p <0.05) significantly influence knowledge management capacity since the t-values surpass 1.96 and the p-values are less than 0.05. Consequently, the hypotheses on the link (H1, H3, & H4) were validated. The other construct did not significantly affect radical innovation capability, since the t-values were below 1.96 and the p-values exceeded 0.05.

Mediating Effect of KMC on HRM and Radical Innovation Capability

The results indicate that the path coefficients for acquisition (β= 0.039), documentation (β= -0.007), and information system (β= 0.012) were positive. The path coefficients for collaboration (β= -0.189), development (β= -0.012), and egalitarian (β= -0.286) were negative. The subsequent step is to evaluate the importance of the link. The data necessitate bootstrapping with a total of 500 samples per data set. To validate the importance of the association, the p-values must be below 0.05 (p<0.05) and the t-value must surpass 1.96 to accept the hypotheses regarding the link. The findings indicate that knowledge management capability did not mediate the association between human resources and radical innovation capability, as the t-value was below 1.96 and the p-value exceeded 0.05. Consequently, the assumptions regarding the association (H7-H12) were not substantiated.

Mediating Effect of KMC on HRM and Incremental Innovation Capability

The results indicate that the route coefficients for collaboration (β = 0.465), development (β = 0.03), and egalitarian (β = 0.704) were positive. Conversely, the route coefficients were negative for acquisition (β= -0.095), documentation (β= -0.018), and information system (β= -0.03). The subsequent step is to evaluate the importance of the link. The data necessitate bootstrapping with a total of 500 samples per data set. To validate the importance of the relationship, the p-values must be below 0.05 (p<0.05), and the t-value should surpass 1.96 to accept the relationship hypotheses.

The findings indicate that information management mediates the association between collaboration and incremental innovation capability (t=2.617, p<0.05) as well as egalitarianism (t=2.576, p<0.05), with the t-values above 1.96 and p-values being less than 0.05. Consequently, the hypotheses regarding the link (H15 and H18) were validated. The outcomes of H13, H14, H16, and H17 were not corroborated.

5. Discussion and Conclusion

In this section, the findings from the data analysis are further discussed and compared with the previous findings. The purpose of the discussion is to compare and verify the findings with the other studies. In the next subsection discussion according to the objectives of this study.

Direct Relationship Innovative Centric Human Resources Practices with KMC

The findings of the study indicate that human resources practices have substantial knowledge management capabilities. The practices of acquisition, egalitarianism, and collaboration (H1, H3, H4) are crucial for enhancing knowledge management ability in human resources. This outcome (H1, H3, H4) aligns with the findings of Sheng and Chien (2016), who addressed the acquisition of new knowledge and the development of new goods for new clients or emerging markets in the context of exploration.

The principles of acquisition, egalitarianism, and collaboration can be elucidated through ongoing organizational learning. The acquisition enables the individual to learn from peers and acquire new experiences. Furthermore, egalitarianism enables employees at all levels to acquire knowledge within the organization. Collaboration across several departments facilitates the flow of information and experiences among personnel. Consequently, human resources practices are vital to the organization since they enhance opportunities and benefits for organizational performance. The organization's continuous learning orientation enhances its competencies and bolsters the competitive advantage of its human capital (Sheng & Chien, 2016).

The adoption of HRM techniques enables organizations to improve their ability to manage knowledge through the generation, dissemination, and implementation of innovative concepts. According to Zheng et al., (2010), organizations derive greater benefits from diversified external networks developed by employees, as these networks provide varied information kinds and resources, hence enhancing their understanding of recent

technological and institutional advancements. HRM strategies facilitate knowledge sharing, acquisition, and application by promoting improved teamwork and cooperation among stakeholders (Youndt and Snell, 2004). Also, Egalitarian HRM approaches that reduce or eliminate hierarchical disparities have been shown to promote employee engagement in the acquisition, dissemination, and application of knowledge.

Documentation HRM approaches facilitate employee sharing, acquisition, and application of knowledge by mandating the creation and completion of knowledge storage devices, including information systems, manuals, and standard operating procedures (Davenport & Prusak, 1998). Technological HRM methods facilitate the formulation, capture, and management of organizational knowledge by using information technology infrastructure (Youndt & Snell, 2004). A firm's knowledge management role is enhanced by approaches including online databases, groupware, data warehouses, and information processing software (Kamhawi, 2010).

Collaborative HRM strategies facilitate knowledge sharing, acquisition, and application by promoting improved cooperation and collaboration among stakeholders (Youndt and Snell, 2004). Egalitarian HRM approaches that reduce or eliminate hierarchical disparities have been shown to promote employee engagement in the acquisition, sharing, and application of knowledge (Youndt and Snell, 2004). Consequently, human resources practices are crucial to the organization since they enhance opportunities and benefits for organizational performance. The organization's continuous learning orientation enhances its competencies and augments the competitive advantage of its human capital (Sheng & Chien, 2016).

Consequently, human resources practices are crucial to the organization since they enhance opportunities and benefits for organizational performance. The organization's continuous learning orientation enhances its competencies and strengthens the competitive advantage of its human capital (Sheng & Chien, 2016). Thus, the amalgamation of acquisition, egalitarianism, and cooperation has enhanced knowledge management capabilities.

Nonetheless, the development, documentation, and information were not substantial about knowledge management capacity (H2, H5, H6). This has been attributed to inadequate administration of the database system. An SME company is a small enterprise that is unable to consistently maintain its collection of papers. They must allocate substantial resources for an effective database management system. Furthermore, the development necessitates an investigation of novel concepts that are currently absent among the personnel. The employees require exposure and training, rendering development inconsequential to knowledge management capabilities.

Hypothesis H5 posits that documentation does not influence knowledge management. Capabilities in Documentation and Knowledge Management. These indicated that the absence of an adequate documentation system in the majority of small and medium-sized firms may account for the ineffectiveness of organizational learning capability and its correlation with other factors. The standardization of procedures and documents inside the SME is not yet highly developed. The potential for information integration and document standardization among firms is significant, given that the cluster has been functioning for less than five years. Moreover, the predominant proportion of respondents (73.5%) engaged in this study had been employed at the organization for a duration of 5 to 10 years, so limiting their ability to establish an effective documentation system that enhances their knowledge management capabilities.

Among these challenges include the lack of standardization and regulations for document management, along with the restricted utilization of electronic documents and Electronic Document Management Systems (EDMS). Certain criteria evaluated, including executive management commitment and a favorable opinion of document management methodologies and practices, are regarded as strengths for the cluster. Consequently, SMEs will be more proficient in standardizing documents and processes and executing an EDMS. The overwhelming majority of surveyed SMEs engage in document management. A position such as this indicates a company's dedication to investing. Although these investments seem inadequate for the implementation expenses of EDMS, prevailing management practices in this sector, which depend on the administration of paper and electronic documents, validate this assertion. Despite the rapid evolution of document formats in recent years,

corporations continue to depend on conventional techniques, as demonstrated by their storage tools and the limited adoption of electronic documents for information dissemination.

An information system was determined to be not significant for knowledge management competence. Research indicates that the accessibility of information and knowledge management steers corporate innovation processes towards enhanced competitive advantage (Mao, Liu, Zhang, & Deng, 2016). Owners and managers of small and medium-sized enterprises may derive advantages from some findings of our research. Our research yields two key findings: This research indicates that Information Technology capabilities significantly facilitate the development of higher-order capabilities. Surpasses the performance of tiny enterprises. The allocation of finances alone is insufficient for the integration of Information Technology into their processes; nonetheless, it is essential to acknowledge that Information Technology can yield beneficial outcomes if they opt to apply or enhance its more advanced or complex capabilities.

The Mediating Effect of KMC between Human Resource Management Practices and Radical Innovation Capability

The findings indicate that knowledge management capacity did not moderate the association between human resources and radical innovation capability, since the t-value was below 1.96 and the p-value was below 0.05. The suggestions regarding the link from H7 to H12 were not substantiated. This may be elucidated by the inclination of SME ICT enterprises in Malaysia towards radical innovation. Most organizations typically encounter difficulties in handling the introduction of products founded on radical innovations. They lack the proficiency to navigate the hurdles and capitalize on the commercial opportunities associated with the introduction of disruptive or discontinuous technology (Alfawaire & Atan, 2021). The unpredictability of outcomes and market applications for a novel concept renders the function of knowledge management capabilities a significant challenge in forecasting the new product. It became harder to evaluate an innovation's potential and market acceptance the more radical it is. There is a substantial knowledge gap between theory and practice due to the growing complexity and market dynamics. Numerous organizations lack the structure to foster innovative ideas, identify critical market trends, swiftly react to evolving market conditions, or initiate market reforms. This case elucidates why knowledge management capability did not mediate the association between human resource management practices and radical innovation capability. Implementing radical innovation is inherently tough.

The Mediating Effect of KMC between HRM Practices and Incremental Innovation Capability

The study reveals that knowledge management capacity moderates the association between egalitarian and incremental innovation capabilities, and the relationship between cooperation and incremental innovation potential is mediated by knowledge management capacity. Collaboration within teams enables all members to acquire new information and experience from one another, and the principle of equality effectively facilitates knowledge management capacity for incremental innovation. The integration of new knowledge with existing knowledge facilitates the reconfiguration of organizational capacities and competencies, resulting in value-added products. Knowledge management skills are crucial for organizations and SMEs to foster product and process innovation capabilities, attaining competitive advantage.

However, knowledge management capacity did not mediate the interaction between acquisition, development, documentation, and information, and both radical and incremental innovation capability. Acquisitions in SMEs facilitate business expansion through the purchase of an existing enterprise, leading to a substantial increase in resources and knowledge, which often enhances diversity and transforms a company's resource and knowledge foundation. However, in the absence of resource sharing throughout the broader organization, novel combinations and opportunities may remain unreal.

The mediation effect of KMC did not influence the connection between development approaches and innovative capabilities. This occurs in SMEs because KMC did not moderate the relationship between development practices and innovation capability. Training and development activities can enhance alignment between employees' existing and necessary knowledge and skills, fostering knowledge creation and advancing human capital. However, skills may decline and become outdated, and the capacity for knowledge management did not mediate the relationship between acquisition and innovative capabilities.

Poor record management in documentation processes hinders KMC procedures and leads to business innovation failures. Insufficient planning, design, coordination, and assessment are factors that hinder KMC from mediating the relationship between information systems and innovation capabilities. The insufficient expertise of knowledge managers and staff leads to the use of the information system for fostering innovative capabilities. Furthermore, SMEs face difficulties with inadequate planning and inflated expenses associated with the implementation of new information technology. Therefore, the capacity for knowledge management did not mediate the relationship between acquisition and innovative capabilities.

Conclusion

Research has shown that innovation is a crucial driver of growth and competitive advantage for organizations. However, Malaysia's level of innovation is still low, and studies on factors affecting innovation capability and corporate innovation are scarce. Human capital is the primary resource for fostering innovation, as it provides expertise, knowledge, and skills that can transform an organization. Common practices in human capital management include acquisition, collaboration, development, documentation, egalitarianism, and information systems.

Malaysian ICT SMEs possessing significant social capital promote collaboration both internally and externally among firms. Employees with exceptional competence, creativity, and intelligence are considered essential for enhancing innovation capabilities. These employees enhance the organization's innovation capacity by delivering services and products that offer unique advantages over competitors, addressing client challenges with innovative methods, proposing creative solutions and ideas, presenting original solutions to clients, and pursuing unconventional solutions to problems.

Knowledge management (KMC) is a vital resource that affects innovative capabilities. KMCs promote collaboration both internally and externally among firms, allowing employees to acquire proficiency in collaboration, identify and resolve issues, engage in dialogue and idea exchange, disseminate information, learn collectively, and establish partnerships with customers, suppliers, alliance partners, and others.

In conclusion, further research is needed to ensure the growth of local businesses in Malaysia through organizational innovation. The HR framework of a Malaysian company can be structured to promote knowledge acquisition, information exchange, and knowledge application to enhance innovative skills within Malaysian organizations.

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The Impact of Technological-Organizational-Environmental (TOE) Factors on Homestay Performance

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Abstract: Homestay have been a part of the tourism industry for a long time, however, their prevalence is still lower than the other travel-related services. Determining the factors that homestays should have to improve their performance and level them with other tourism services is the goal of this pilot study. Thus, this study aims to investigate how homestay performance can be improved by using the TOE Framework. To do this, a self-administered questionnaire was distributed among 50 homestay coordinators in the pilot study. To verify the validity and internal consistency of the measures, a few tests were carried out on the data by using SPSS 29 software. The three factors examined in this study which are technology, organization and environment factors were all determined to be significant. The findings show that homestays should give each of these factors top priority if they want to improve their performance and stay competitive in the tourism industry. In conclusion, the uniqueness of this study has contributed to the development of the most effective homestay business plan and provided empirical data for the study, both of which are essential resources for decision-makers engaged in the execution of future research.

Keywords: *TOE Framework, Homestay, Homestay performance, MOTAC, Tourism*

1. Introduction and Background

The government of Malaysia has allocated RM 237.61 million to the Ministry of Tourism, Arts and Culture (MOTAC), in an attempt to boost the tourism industry (Zulkefli, Che Aziz and Mohd Radzol, 2021). These kinds of grants support the economic development of rural communities with limited resources by facilitating a variety of business transactions of commodities, crafts and services. This provides the opportunity for the community to seek careers in business. Therefore, Community Based Tourism (CBT) is viewed as an excellent option to launch a number of activities that encourage tourists to learn about accessible natural treasures. Homestay is a common CBT program that allows participants to visit neighboring towns and villages as well as reside with local foster families (Phunnarong, 2021). This is because the Homestay program is one of the initiatives that the rural community takes part in to enhance living circumstances, strengthen community bonds and reap equitable benefits from the homestay (Kunjuraman, Hussin, and Aziz, 2022). As stated by Azman (2020); Ramele and Yamazaki (2020), this Homestay program was officially launched in 1995 and distributed to all rural villages in Malaysia.

Additionally, guests can stay with host families through this program, interacting with family members and taking in the customs and daily activities of the community (Azhar et al., 2021). Furthermore, Zulkefli et al. (2021) found that this program was designed to provide unique experiences to tourists who are eager to learn about the local way of life and culture, as well as to develop a fresh and reasonably priced rural tourism service for the global market.

According to Balasingam and Bojei (2019), this program also will help in enhancing the social and economic status of the community by reducing unemployment and creating job opportunities. Where the program offers various advantages to the community, including generating income, developing the handicraft sector and fostering rural culture (Janjua et al., 2021).

Even with all of the government incentives that the Homestay program has received, it is still a slowly expanding industry. There is a problem with registered homestays declining interest in taking part in the

program. This is in line with Ismail et al., (2016) study stated that the homestay program faces numerous challenges, due to external and internal factors in its business environment that affect the program's performance and efficiency. Thus, to what extent the usage of the TOE Framework in the Homestay Program is yet to be determined. In addition, there is less evidence on how the TOE Framework is utilized in practice, reflecting the context of use in a homestay program, which is confined and susceptible to situational constraints (Agyeiwaah, 2018; Siti Nabiha, Nordin, and Poh, 2021). Thus, to enrich the literature, this study seeks to investigate the influence of TOE factors on the performance of homestay in Malaysia.

2. Literature Review

There are a number of well-known frameworks that aid the explanation of why individuals or organizations decide to accept or reject new technologies. The TOE framework, which integrates technology, organization, and environment, has gained significance in analyzing the ways in which different elements impact the financial performance of businesses, including homestays. The purpose of this literature study is to examine how the TOE framework has been used to evaluate homestays' financial performance, with an emphasis on the ways in which these elements support both operational effectiveness and profitability. This review attempts to provide a thorough understanding of how homestays can use the TOE framework to improve their financial performance by highlighting important findings and gaps in the literature through a synthesis of recent research. Hence, this is how the TOE framework and homestay performance are summarized

TOE framework

The TOE framework is a well-known theoretical model that explains how technology is adopted and integrated into businesses (Fan et al., 2023). This framework was first proposed by Tornatzky and Fleischer during the progress of technology (Tornatzky & Klein, 1982). It includes technological, organizational and environmental factors. Compared to the other theory, the TOE framework has the advantage of being able to identify both internal and external impacts, as well as offering a more comprehensive research perspective (Zhong and Moon,2023). Perceived relative advantage, perceived compatibility and other pertinent technologies utilized by the company are all included in the technological factors (Amini and Jahanbakhsh, 2023). Organizational factors comprise the firm's characteristics and features, including its size, the level of competence of its human resources, the quantity of resources at its disposal, and its organizational structure (Kwabena et al., 2021). According to Ramlan et al., (2023), the environmental context includes external factors that have an impact on the company.

Technological Factors

Technological factors refer to the creative efforts made by an organization to acquire new technologies that could improve its performance (Wang et al., 2016). Tornatzky et al. (1990) highlighted the importance of company capabilities in managing technology by emphasizing the technological aspect within the TOE framework. In terms of putting technological components into practice, Yalcin and Daim (2021) have recommended acquiring technology as well as having the ability to manage, integrate, and develop with these elements successfully. Technology will continue to grow as long as internal factors continue to drive it and performance will also increase with it. Naturally, internal R&D alone is not enough to improve an organization's performance. Some companies that have a long R&D cycle and a high difficulty coefficient can achieve twice the outcomes in half the time by introducing new technology. Thus, the introduction of new technology can improve an organization's performance in innovation. Technological advancement is the key factor driving this improvement.

Organizational Factors

Kwabena et al., (2021), claimed that organizational factors affect an organization's performance. In accordance with Stenberg and Nilsson, (2020), "internal resource bases and procedures that affect an organization's ability to respond to both the internal and external environment" are referred to as organizational factors. It may affect the planning, overall performance and strategic objectives. Additionally, Ellstrom et al., (2022) stated that organizational expertise and innovation are necessary for organizations to improve their performance. In this regard, businesses should be able to strategically create long-term goals (AlNuaimi et al., 2022). Organizational skills are also necessary for this organizational aspect. Some of its constituents are an agile organizational structure (Adel, 2022), effective decision-making procedures and the capacity to reallocate

personnel and resources as necessary (Asker and Mergel, 2022).

Environmental Factors

Based on Amini & Jahanbakhsh (2023) stated that environmental factors are things that affect and impede particular operational characteristics. This element includes the demands of the market and customers, trading partners, readiness, sociocultural considerations, government support and technical infrastructure (Zhong and Moon, 2023). This is in line with Ramlan et al. (2023) defined the environmental context as external factors that impact the firm, like competition from competitors and pressure from suppliers or customers. Moreover, regarding the environmental element, businesses need to be able to respond quickly to external factors such as market trends, industry upheavals, and regulatory changes (Steininger et al., 2022). In this instance, organizations require governance-risk-management-compliance (GRC) to manage the environment and guarantee that, through risk management and regulatory compliance, the organization can obtain performance from the application of the TOE Framework (Abdurrahman et al., 2023).

Homestay

The official homestay program is known as a cluster homestay and is managed by the Ministry of Tourism and Culture (MOTAC) (Bachok, Hasbullah, Ab Rahman, 2018). Moreover, according to Ramele & Yamazaki, 2020; and Azhar et al. 2021 stated that MOTAC started promoting the homestay program in 1995. They also have produced a set of guidelines and regulations that these cluster homestays must follow (Ramele & Yamazaki, 2020). Therefore, recognition and program licenses will only be granted to property owners who comply with the rules and regulations for hosting visitors (Noor and Awang, 2018).

Moreover, MOTAC also established branches of the Malaysian Homestay Association (MHA) in every state in Malaysia so that they could participate in the inspection of the host family house throughout the registration process for cluster homestay (Velan, 2019). This Association will coordinate discussions and negotiations between the host family and MOE. Additionally, they also took part in marketing and advertising for homestays, which prompted a lot of visitors to sign up for the program (Ramele & Yamazaki, 2020). Furthermore, Nor and Awang (2018) stated that the MOTAC Homestay logo is placed in front of the house and marks it as a "cluster homestay," making it easy to recognize the homestays that have been registered with MOTAC in Malaysia. They also claimed that MOTAC is the owner of the logo's patent and prohibits unregistered homestay providers from using it (Nor and Awang, 2018).

Figure 1: Logo Cluster Homestay



Nevertheless, based on Wang et al.' (2016) stated that the Homestay program is a tourism product that gives visitors a sense of local community life and a pleasant rural environment. Adli and Chin (2021) further define homestay as a type of lodging in which visitors stay in private houses with a host family, who typically reside on the premises. This is in line with Ayupp, Jaafar and Tinggi, (2021) stated that the guests will have the opportunity to participate in community events and communicate with the hosts to exchange information, customs, and life experiences.

Additionally, the program seeks to generate income and economic booster for rural communities (Kayat et al., 2016). This is reached by their engagement in operating homestays out of their homes and by taking part in other activities that are part of the packages that are offered to the visitors (Mapjabil et al., 2017). In addition, according to MOTAC (2024), based on statistics, showing that there were about 208 homestay programs registered in Malaysia involving the participation of a total of 450 villages and 3397 operators in December

2023 which is a decreasing number from previous years. There is a problem with cluster homestays declining interest in taking part in the program which affects the performance of the homestay (Ramele & Yamazaki, 2020; Nor and Awang, 2021).

Performance of the Homestay

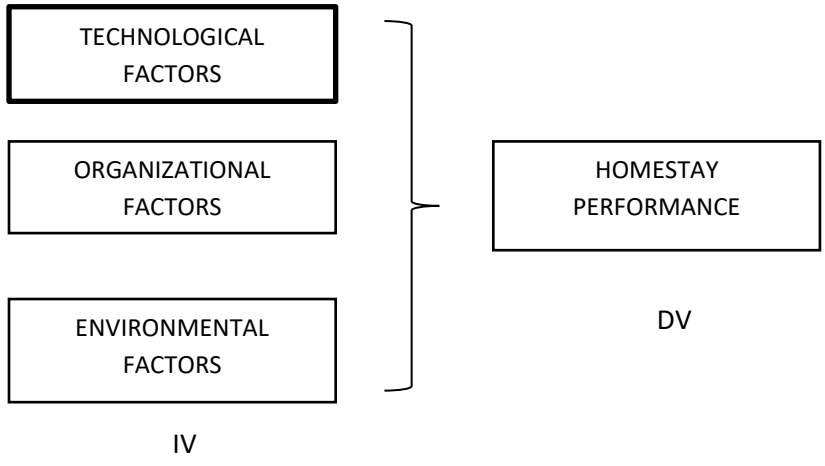
The performance of an organization can be evaluated using both financial and nonfinancial parameters (Zulkefli et al., 2021). Based on Dawayana et al., 2021 stated that productivity, sales growth, cash flow, and profitability are examples of financial criteria measurements. On the other hand, non-financial goals contribute to alternative success measures, such as customer satisfaction, effective leadership, strong partnerships with public and private organizations and uniqueness of homestay attractions (Zulkefli et al., 2021).

Homestay is an initiative taken by the government to enhance the standard of living among the participating rural communities (Kunjuraman, Hussin, and Aziz, 2022). There was little research done on performance evaluation in homestay settings (Yong et al., 2021). Moreover, Walker and Brown (2004) claimed that the relationship between financial and nonfinancial variables indicates actual performance for success and can be explained more thoroughly. Previous studies have indicated that a multitude of factors may impact the homestay's performance; however, this particular study focuses exclusively on its financial performance.

Furthermore, according to Golovkova et al. (2019), financial performance is the phrase used to describe financial operations. The achievement of financial objectives is frequently indicated by financial performance. Golovkova et al. (2019) define it as the process of evaluating how a company's policies and operations affect its bottom line. Thus, to enhance the effectiveness of homestay performance, homestay operators should persist in their focus on creating unique business approaches (Devadas and Jayasooriya, 2021).

The theoretical framework is then demonstrated in the next section, followed by the methods for data collection and analysis in the next section, and finally, the main conclusions and results are presented. The context-specific information that follows should be especially helpful in pointing out potential areas for improvement.

Conceptual Framework



The framework above is drawn to evaluate the relationship between all variables. On the left side of the model are the independent variables (TOE Factors) as influencing factors. The right side of the model shows the dependent variable which is the Homestay Performance.

3. Research Methodology

In this section, the researcher outlines the methodology strategy, which includes defining the target population, the survey's nature, sample size estimation and survey instruments.

Research design

This paper is a pilot study that uses a structured questionnaire with a quantitative research design to gather data from the homestay coordinators. The purpose of the study is to look into the relationship between the financial performance of the homestay and the TOE framework, which considers technological, organizational, and environmental factors. The study focuses on the major concepts included in the TOE framework and examines the connections between these factors and the financial performance of the homestay using SPSS 29 software.

Population and Sampling

Data was collected from homestay coordinators who act as the representatives to represent the cluster homestay that are registered with MOTAC. The rationale for selecting these respondents is that they are the people who will report the homestay's performance as a whole to MOTAC, have the knowledge to provide accurate responses and are the best people to complete the questionnaire.

The researcher employed quantitative research and a self-administered survey questionnaire was used as an instrument to collect data. The type of sampling used for this research was the probability sampling technique by using purposive sampling method. For a pilot study, a smaller sample size is often deemed appropriate to test the research instruments and collect preliminary data. However, it is important to ensure that the sample size is large enough to generate reliable results.

Sampling and Data Collection Process

A total of 50 questionnaires for the pilot study were distributed to get higher response and only 30 questionnaires were completed and returned, yielding a response rate of 60%. This response rate is considered adequate for pilot studies but highlights the need for efforts to improve participation in larger-scale studies. Moreover, the survey questions were made bilingually (English and Bahasa Malaysia translation) to make it easier for the respondents to answer the questions. Section A will describe the respondents' demographic profile. Sections B, C, D and E were used to assess respondents' level of agreement and the results were analyzed using SPSS 29. All constructs were measured using established scales adopted from existing literature on a seven-point Likert scale.

4. Results of the Study

Descriptive Analysis

The total number of respondents for this study was 30 respondents which consisted of Homestay coordinators.

Table 1: Frequency analysis

Variables	Items	Frequencies	Percentage
Gender	MALE	19	63.3
	FEMALE	11	36.7
Age	21-40	3	10
	41-60	12	40
	ABOVE 61	15	50
Education	SPM	18	60
	CERTIFICATE DIPLOMA	3	10
	DEGREE AND ABOVE	5	16.7
		4	13.3
Type of Social Media Use	Facebook	19	63.3
	Instagram	2	6.7
	TikTok	0	0
	Other	9	30

Based on Table 1, show the frequency analysis for the study. Overall, of the 30 respondents, 63.3 percent were male respondents and 36.7 percent were female. Respondents age above 61 years old were collected as the highest sample with 15 people (50%) from the whole sample size. Respondents age between 21 to 40 years old

represent the lowest sample for overall research. Additionally, most of the respondents have SPM as their educational level which is 18 respondents (60%). Besides that, the type of social media used by all the respondents was also gathered. The least respondents use Instagram by 2 respondents (6.7%) to promote their homestay. Continuously, the highest percentage of respondents who prefer to use Facebook to promote their homestay was 63.3 percent or 19 respondents.

Table 2: Reliability analysis

Variables	Cronbach's Alpha	N of Items
Technological	.823	10
Organizational	.732	8
Environmental	.685	9
Homestay Performance (DV)	.8.55	11
OVERALL	.872	38

Table 2 shows the results of the reliability test. It demonstrates that there are different degrees of internal consistency amongst the various constructs. The technological and homestay performance variables have reliability (0.823), indicating that the items that measure these constructs are regularly dependable and in good alignment with the dimensions in which they are contained. Additionally, the Organizational factor shows an acceptable reliability of 0.732, which demonstrated generally consistent measurement, though there is room for potential improvement. While, the environmental variable has a moderate reliability of 0.685, indicating that further modification of the environmental component measurement may be necessary to attain higher consistency.

In conclusion, a total Cronbach's Alpha of 0.872 indicates that the measuring instrument has good internal consistency for all variables. As a result, there can be confidence in the consistency and reliability of the study findings, even in the face of some variability in the individual variables that make up the combined instrument. Reviewing and perhaps changing the Environmental factor's elements to increase internal consistency would help produce the most accurate and trustworthy findings.

Table 3: Normality analysis

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Technological Factors	.166	30	.200*	.930	30	.600
Organizational Factors	.106	30	.200*	.974	30	.657
Environmental Factors	.120	30	.200*	.972	30	.607
Homestay Performance	.143	30	.200*	.960	30	.513

The normality test was used to determine whether or not the study data had a normal distribution. Table 3 shows the results of the normality test on each of the constructs in this pilot study. It indicates that all the data for each of the constructs has a normal distribution. This is supported by the fact that the estimated p-values are greater than the significance level (0.05). Consequently, the study data for the research is distributed normally.

Table 4: Validity analysis

	KMO values	Bartlett's Test of Sphericity (Sig.)
Technological Factors	.666	<.0001
Organizational Factors	.748	<.0001
Environmental Factors	.776	<.0001
Homestay Performance	.742	<.0001

Exploratory Factor Analysis (EFA) was used to determine the basic structure of the instruments used in this investigation. The validity test, which includes KMO values and Bartlett's Test for all constructs which are technological, organizational, environmental and homestay performance is shown in Table 4. The scores are

0.666 for technology, 0.748 for organizational, 0.776 for environmental and 0.742 for Homestay performance. A strong correlation between the variables is shown by an overall KMO value above 0.6 and a p-value for Bartlett's test of sphericity below 0.05, which is considered acceptable. Thus, Lorenzo (2003) claimed that the data is appropriate for factor analysis.

5. Implications

Theoretical implication

The theoretical implications of this study are the contribution to knowledge in several ways. Firstly, it adds to the existing literature on performance by expanding the relationship between the TOE Framework and organization performance, focusing on the homestay industry. Second, based on the findings all the results were significant and it confirms the need for the TOE Framework to improve homestay performance. Third, this study also provides empirical findings on how the TOE Framework can be used to study small businesses and not only large corporations as the main respondents of this study were homestay operators who are mainly small business owners from mostly in rural areas.

Practical implication

This study also provides managerial contributions, especially for the homestay industry in Malaysia. The implication of the findings will help homestay operators comprehend the variables affecting the homestay program. Therefore, to strengthen the homestay program, the Ministry of Tourism, Arts, and Culture of Malaysia (MOTAC) and homestay operators should use these components as a standard. Moreover, it is essential to comprehend the TOE components that affect performance to design a program with a strong structure. Furthermore, the study is effective in pinpointing traits that enhance the effectiveness of the homestay program. In general, a number of parties, including researchers, MOTAC, homestay operators, and the tourism industry, will benefit from the data and conclusions from this study.

Conclusion

This study aims to investigate the influence of TOE factors on the performance of homestay in Malaysia. The TOE framework was used as a suitable theoretical foundation for the suggested conceptual model. To accomplish the study's aims, a quantitative field survey was conducted using a self-administered questionnaire, which was distributed to obtain data from a purposive sample. The data analysis and results were presented, including the details of the respondents in the survey sample. It can be concluded that there are strong relationships between Homestay performance and each of the three TOE framework components.

This suggests that the independent variables (technological, organizational, and environmental) have an impact on the dependent variable, which is homestay performance. Technology has the greatest influence on a homestay's performance, according to every hypothesis that was investigated and proven to be accurate. The results of this study have significant implications for both practitioners and researchers, especially in relation to how the homestay is carried out. Consequently, the findings support the Homestay Program's ability to manage tourism resources while serving as a catalyst for community development. Additionally, it also assists them in developing their knowledge and skills in managing the homestay effectively. Therefore, to boost the regional economy and create job opportunities in remote areas.

Limitations and Recommendations

Despite the significant findings, this research addressed a few limitations in examining the TOE framework to enhance homestay performance. Firstly, the respondents were all homestay coordinators. Examining the perceptions of other prospective users in the homestay organization such as the homestay operator and officer in MOTAC could probably give more insights and different reviews regarding the Homestay performance.

Next, the issue of generalizability arises, as the findings rely solely on data from the Homestay industry. To enhance applicability, future research may consider extending the study to other industries. Hence, recognizing that diverse regulations, cultural norms and business practices could influence the relevance of the framework. The last limitation is that researcher would be beneficial to test this model with data from the homestay industry in different countries, as it allows for potential modifications and enhancements to the model. Another area of research involves expanding and developing various inputs within the TOE framework.

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The Determinants of Bank's Liquidity: Comparative Analysis From Global Islamic Banks and Conventional Banks

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Abstract: This study investigates the determinants of bank liquidity in both Islamic and Conventional banks across 15 countries, focusing on key variables such as profitability, capital adequacy, bank size, and credit risk. Utilizing data from 107 Islamic banks and 506 Conventional banks spanning from 2013 to 2022, the analysis reveals significant differences in liquidity management between the two banking systems. The Random Effect Model (REM) was employed based on the Hausman test results to ensure robustness. The findings indicate that profitability negatively impacts liquidity in Islamic banks, likely due to investments in less liquid, Sharia-compliant assets, while it positively influences liquidity in Conventional banks, where profits are often reinvested into liquid assets. Capital adequacy emerges as a crucial determinant of liquidity in both bank types, highlighting the importance of maintaining strong capital buffers. The study also finds that credit risk significantly reduces liquidity in Conventional banks, whereas it has a lesser impact on Islamic banks. These insights contribute to a deeper understanding of liquidity management practices in Islamic and Conventional banks, offering valuable implications for bank managers, policymakers, and regulators.

Keywords: *Islamic banks, Conventional banks, Liquidity, Shariah compliance, Random Effect Model (REM)*

1. Introduction and Background

The banking sector is integral to global economic development, providing the financial infrastructure that supports businesses, facilitates trade, and ensures overall economic stability. At the core of banking operations lies the critical task of liquidity management, which enables banks to meet short-term obligations and maintain customer trust and confidence. Whether operating under conventional frameworks or Islamic principles, banks must navigate the complexities of liquidity management to safeguard against financial instability. However, the approaches to liquidity management differ significantly between conventional and Islamic banks due to their distinct operational principles and regulatory environments (Majeed & Zainab, 2021; Moussa, 2015).

Islamic banks(IB), governed by Shariah law, are characterized by their prohibition of interest (riba) and their commitment to ethical, asset-backed transactions. These unique characteristics present Islamic banks with challenges not typically encountered by their conventional counterparts. For instance, the limited availability of Shariah-compliant financial instruments can restrict Islamic banks' ability to manage liquidity effectively, thereby increasing their exposure to liquidity risk. This issue is particularly critical in a globalized economy where financial shocks can quickly ripple across borders, impacting banks of all types (Jedidia, 2020; Ghenimi et al., 2021).

Despite the importance of effective liquidity management, recent years have witnessed significant challenges for both Islamic and conventional banks. The collapse of Lehman Brothers in 2008, which triggered a global financial crisis, is a stark reminder of the catastrophic consequences that can arise from poor liquidity management. More recently, the failures of Silicon Valley Bank and other financial institutions in the United States have underscored the ongoing vulnerabilities within the banking sector, despite advances in regulatory oversight and risk management practices (Kwaku & Mawutor, 2014). These incidents emphasize the pressing need for banks to develop robust liquidity management strategies that are resilient in the face of economic uncertainties.

The challenges faced by Islamic banks in managing liquidity are further compounded by the constraints imposed by Shariah law. The prohibition of interest and the need to engage only in ethical, profit-and-loss-sharing transactions limit the tools available to Islamic banks, making liquidity management more complex and

less flexible compared to conventional banks. Moreover, there is a significant gap in the academic literature regarding the comparative effectiveness of liquidity management practices between Islamic and conventional banks. While numerous studies have explored the determinants of bank liquidity, few have provided a comprehensive analysis specifically comparing these two banking systems on a global scale (Ghenimi et al., 2021; Jedidia, 2020).

Over the past few decades, the global banking industry has undergone profound transformations driven by rapid technological advancements, evolving regulatory frameworks, and shifting economic landscapes. Banks, whether Islamic or conventional, play a crucial role as intermediaries in the economy, balancing the supply and demand for financial capital. This intermediary function is vital for maintaining liquidity, which is the lifeblood of any financial institution. Liquidity enables banks to fulfill their short-term obligations, such as customer withdrawals and interbank loans, without incurring significant losses. The management of liquidity is, therefore, essential for the stability of banks and, by extension, the broader economy (Moussa, 2015; Munteanu, 2012).

In conventional banking (CB), liquidity management is typically achieved through the use of interest-based instruments and interbank lending. However, Islamic banks, adhering strictly to Shariah principles, face additional challenges in this regard. The prohibition of interest necessitates the use of alternative, Sharia-compliant financial instruments, which are often less flexible and less readily available than their conventional counterparts. Consequently, Islamic banks must navigate a more complex landscape in managing liquidity, balancing the demands of Shariah compliance with the practical needs of maintaining sufficient liquidity levels (Majeed & Zainab, 2021).

As the global Islamic banking industry continues to grow—now accounting for a significant portion of global banking assets—it is imperative to develop a deeper understanding of how liquidity is managed within this sector. The distinct operational principles of Islamic banks necessitate a different approach to liquidity management compared to conventional banks, raising important questions about the comparative effectiveness of these approaches. This study seeks to address this gap by conducting an in-depth comparative analysis of the determinants of bank liquidity in global Islamic and conventional banks. By focusing on key bank-specific factors such as profitability, capital adequacy, bank size, and credit risk, this research aims to uncover the nuanced ways in which these variables influence liquidity across different banking systems namely Islamic banking, conventional banking and banks. The findings are expected to contribute valuable insights into the unique challenges faced by Islamic banks and provide broader implications for the stability and performance of the global banking sector (Munteanu, 2012; Moussa, 2015).

2. Literature Review

Bank liquidity management has been a critical area of study, particularly in understanding the trade-offs banks must navigate between profitability and liquidity.

The Trade-off Theory suggests that banks face a fundamental decision: they can either hold liquid assets to safeguard against insolvency or invest in less liquid assets that typically offer higher returns. According to Eljelly (2004) and Achampong (2022), while liquid assets enhance a bank's ability to meet short-term obligations, they generally yield lower returns, thus reducing overall profitability.

The Too Big to Fail (TBTF) Theory further complicates this dynamic. This theory, which gained prominence in the 1984 bailout of Continental Illinois Bank, argues that large banks may engage in riskier behavior because they expect government intervention in the event of failure. As Gorton and Tallman (2016) note, TBTF institutions might deprioritize liquidity management, assuming they will be bailed out, which could exacerbate their vulnerability during financial crises.

The Bad Management Theory posits that poor internal management practices, including inadequate risk assessment and liquidity management, can lead to significant financial distress. This theory emphasizes that internal factors, such as inefficient asset-liability management, can create liquidity problems even in the absence of external shocks (Ghoshal, 2005).

Finally, the **Buffer Capital Theory** suggests that maintaining a capital buffer above the regulatory minimum can protect banks against unexpected losses and improve their liquidity positions. This theory argues that well-capitalized banks are better positioned to absorb shocks and maintain liquidity during periods of financial stress (Munteanu, 2012).

Empirical Literature Review

Empirical research on bank liquidity has identified several key factors that influence liquidity management across different banking systems. These factors include profitability, capital adequacy, bank size, and credit risk.

Profitability is often seen as a double-edged sword in the context of liquidity management. On one hand, profitability can enhance a bank's capital base, providing more resources for liquidity. However, studies by Al-Harbi (2020) and Mokni and Rachdi (2014) suggest that higher profitability may lead banks to invest in less liquid, higher-yielding assets, thereby reducing their overall liquidity. This inverse relationship is particularly evident in Islamic banks, where profitability is often lower than in conventional banks due to the constraints of Shariah-compliant financing.

Capital Adequacy is another critical determinant of bank liquidity. Capital adequacy ratios, which measure a bank's capital relative to its risk-weighted assets, are crucial for ensuring financial stability. Munteanu (2012) and Al-Harbi (2020) found that banks with higher capital adequacy ratios tend to have better liquidity management. This is especially true for Islamic banks, which must maintain higher capital buffers to comply with Shariah principles and mitigate liquidity risks.

Bank Size also influences liquidity management, though its impact can vary. Larger banks typically have more diversified portfolios and greater access to external funding, which can enhance their liquidity. However, as Al-Homaidi et al. (2019) and Vodová (2019) observed, larger banks might hold fewer liquid assets due to their broader investment opportunities, making them potentially more vulnerable to liquidity crises.

Credit Risk is closely linked to liquidity, as higher credit risk can undermine a bank's ability to convert assets into cash. Munteanu (2012) and Al-Harbi (2017) demonstrated that banks with higher credit risk tend to have lower liquidity, as they may struggle to liquidate assets without incurring significant losses. This relationship highlights the importance of effective credit risk management in maintaining adequate liquidity.

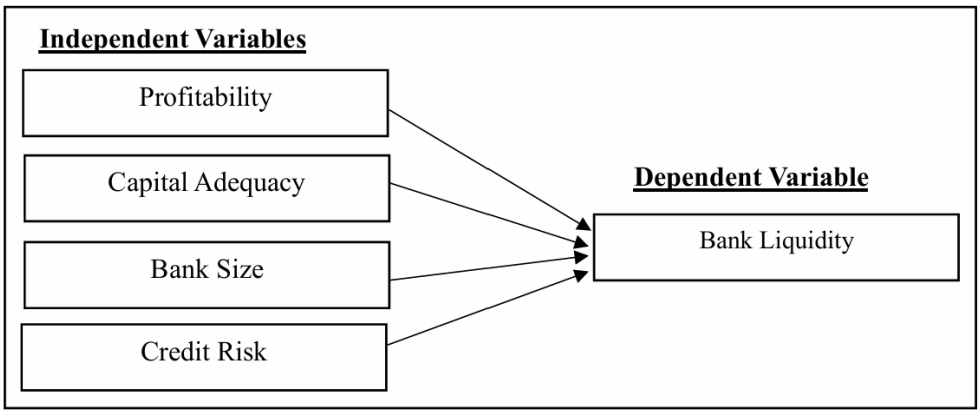
3. Research Methodology

The study examines the relationship between the dependent and independent variables. The dependent variable is the LIQ, while the independent variables are selected based on the review of previous studies which are PROFIT, CAP, BSIZE, CR and type of banks. The research methodology outlines the theoretical framework, hypothesis statements, variables and measurements, data collection methods, and the statistical techniques employed to analyze the data.

Theoretical Framework

The study consists of three models of the theoretical framework because this study compares the factors determining the LIQ in IBs and CBs globally. Model A and Model B address Islamic banking and conventional banks respectively while Model C focuses on the whole groups of banks.

Figure 1: Proposed Framework



Models A, B and C

Table 1: Variables and Measurement

Variables	Notation	Proxy and Measurement	Unit
		Dependent Variable	
Bank Liquidity	LIQ	**Net Loan to Deposit Ratio =** $\frac{Net\ loans}{Deposit} x\ 100$	%
		Independent Variables	
Profitability	PROFIT	**ROAA =** $\frac{Net\ income}{Average\ Total\ Asset\ Value} x\ 100$	%
Capital Adequacy	CAP	**Tier 1 Cap. Ratio =** $\frac{Tier\ 1\ Capital}{Total\ risk-weighted\ asset} x\ 100$	%
Bank Size	B SIZE	**Natural Logarithm of Total Asset =** log (total assets)	USD Million
Credit Risk	CR	**NPL Ratio =** $\frac{NPL}{Gross\ loan} x\ 100$	%
		Dummy Variable	
Type of Banks (Dummy)	TYPE	0 is for Islamic banks, 1 is for Conventional bank	

Data Collection

The study examines the determinants of bank liquidity in a sample of global Islamic and Conventional banks across 15 countries, including Malaysia, Saudi Arabia, Indonesia, and others. Data were collected from 107 Islamic and 506 Conventional banks, covering the years 2013 to 2022, to capture the most recent trends in liquidity. These countries were selected based on their performance in the Islamic Finance Development Indicator (IFDI) 2022 report. The study utilizes data from FitchConnect, resulting in 6,130 observations (1,040 from Islamic banks and 5,090 from Conventional banks). The data were refined through several tests to ensure accuracy and were analyzed using Stata 12 SE.

Multiple Linear Regression Models

To investigate the determinants of bank liquidity, the study employs multiple linear regression models. These models enable the analysis of the relationship between the dependent variable and several independent variables (profitability, capital adequacy, size, and credit risk).

Model A: Islamic banks

$$LIQ_{it} = \alpha_0 + \alpha_1 PROFIT_{it} + \alpha_2 CAP_{it} + \alpha_3 BSIZE_{it} + \alpha_4 CR_{it} + \varepsilon_{it}$$

Model B: Conventional banks

$$LIQ_{it} = \beta_0 + \beta_1 PROFIT_{it} + \beta_2 CAP_{it} + \beta_3 BSIZE_{it} + \beta_4 CR_{it} + e_{it}$$

Model C: Islamic and Conventional Banks

$$LIQ_{it} = \gamma_0 + \gamma_1 PROFIT_{it} + \gamma_2 CAP_{it} + \gamma_3 BSIZE_{it} + \gamma_4 CR_{it} + \gamma_5 TYPE_{it} + u_{it}$$

Where,

$LIQit$ =Bank liquidity I at year t

$PROFITit$= Profitability of the bank I at year t

$CAPit$= Capital adequacy of the bank I at year t

$BSIZEit$ = Size of the bank I at year t

$CRit$= Credit risk of the bank I at year $tTYPEit$= Types of banks I at year t

ε_{it}, e_{it}, u_{it} = error termα, β, γ = intercept

β_1,…,β_5 = regression coefficient

Estimation Techniques

To estimate the parameters of the regression models, this study employs both the Fixed Effects Model (FEM) and the Random Effects Model (REM). These techniques are chosen based on the nature of the panel data and the results of the Hausman test, which determines the suitability of FEM or REM for the dataset.

Fixed Effects Model (FEM): Controls for time-invariant characteristics of the firms, addressing potential biases due to unobserved heterogeneity.

Random Effects Model (REM): Assumes that individual firm effects are random and uncorrelated with the independent variables, offering efficiency in estimation if the assumption holds.

Diagnostic Tests

The validity of the regression models is evaluated through various diagnostic tests:

Multicollinearity Test: Assesses the presence of multicollinearity among the independent variables using the Variance Inflation Factor (VIF).

Heteroscedasticity Test: Checks for heteroscedasticity using the Breusch-Pagan/Cook-Weisberg test.

Autocorrelation Test: Evaluate the presence of autocorrelation using the Wooldridge test for panel data.

4. Data Analysis and Results

The data analysis involves several steps:

Descriptive Statistics: Summarize the central tendencies and dispersion of the variables.

Correlation Analysis: Examine the relationships between the independent variables and the dependent variable.

Regression Analysis: Assess the impact of the independent variables on the dividend payout ratio using FEM and REM.

Diagnostic Tests: Include multicollinearity, heteroscedasticity, and autocorrelation tests to ensure the validity and reliability of the regression models.

Results

This study analyzes the determinants of bank liquidity in Islamic and Conventional banks across 15 countries, covering the period from 2013 to 2022. The data includes 107 Islamic banks and 506 Conventional banks, focusing on key variables such as profitability (PROFIT), capital adequacy (CAP), bank size (BSIZE), and credit risk (CR). The descriptive statistics reveal that Conventional banks generally exhibit higher profitability and liquidity compared to Islamic banks, which tend to maintain stronger capital adequacy ratios.

Table 2: Descriptive Statistics for Islamic Banks (2013-2022)

Variable	Mean	Median	Maximum	Minimum	Std. Dev.
LIQ	65.32	66.45	89.71	43.12	18.45
PROFIT	1.89	2.10	4.56	-0.89	0.74
CAP	18.76	18.22	25.64	12.45	4.67
B SIZE	12.45	12.32	14.78	10.34	1.29
CR	3.56	3.12	5.89	1.34	1.08

Table 3: Descriptive Statistics for Conventional Banks (2013-2022)

Variable	Mean	Median	Maximum	Minimum	Std. Dev.
LIQ	71.58	72.34	101.23	45.56	22.16
PROFIT	2.34	2.56	6.12	-1.12	1.02
CAP	16.21	15.78	22.34	9.56	3.85
B SIZE	13.78	13.89	16.23	11.12	1.57
CR	4.12	4.00	6.78	1.89	1.25

Table 4: Descriptive Statistics for Islamic and Conventional Banks (2013-2022)

Variable	Mean (IBs)	Std. Dev (IBs)	Mean (CBs)	Std. Dev (CBs)
LIQ	65.32	18.45	71.58	22.16
PROFIT	1.89	0.74	2.34	1.02
CAP	18.76	4.67	16.21	3.85
B SIZE	12.45	1.29	13.78	1.57
CR	3.56	1.08	4.12	1.25

Note: LIQ is measured as the loan-to-deposit ratio, PROFIT as return on assets (ROA), CAP as the capital adequacy ratio, BSIZE as the natural logarithm of total assets, CR as the ratio of non-performing loans (NPLs) to total loans.

Correlation Analysis

Correlation analysis reveals that profitability has a significant negative relationship with liquidity in Islamic banks, suggesting that higher profitability leads to reduced liquidity, likely due to investments in less liquid, Sharia-compliant assets. This finding is consistent with previous studies, such as those by Eljelly (2004) and Mokni and Rachdi (2014), which also noted the trade-off between profitability and liquidity in Islamic banks. Conversely, in Conventional banks, profitability positively correlates with liquidity, indicating that profits are often reinvested into liquid assets, aligning with the findings of Al-Harbi (2020).

Capital adequacy shows a positive correlation with liquidity in both types of banks, underscoring the importance of robust capital buffers. This relationship aligns with studies by Munteanu (2012) and Al-Homaidi et al. (2019), which emphasize the role of capital adequacy in maintaining liquidity.

Table 5: Correlation Matrix for Islamic and Conventional Banks

Variables	LIQ (IBs)	LIQ (CBs)	PROFIT (IBs)	PROFIT (CBs)	CAP (IBs)	CAP (CBs)	BSIZE (IBs)	BSIZE (CBs)	CR (IBs)	CR (CBs)
LIQ	1.00	1.00	-0.45**	0.58**	0.33**	0.41**	-0.12	-0.37**	-0.09	-0.48**
PROFIT	-0.45**	0.58**	1.00	1.00	0.29**	0.35**	-0.08	-0.42**	-0.16	-0.55**
CAP	0.33**	0.41**	0.29**	0.35**	1.00	1.00	-0.15	-0.28**	-0.11	-0.46**
B SIZE	-0.12	-0.37**	-0.08	-0.42**	-0.15	-0.28**	1.00	1.00	0.14	0.23**
CR	-0.09	-0.48**	-0.16	-0.55**	-0.11	-0.46**	0.14	0.23**	1.00	1.00

$p < 0.05$, $p < 0.01$

Regression Analysis

The regression analysis was conducted to examine the impact of the independent variables on liquidity in both Islamic and Conventional banks. Based on the Hausman test, the Random Effect Model (REM) was selected as the appropriate method for both bank types. The REM was chosen because the Hausman test indicated that individual-specific effects are uncorrelated with the independent variables, making the REM more suitable given the diverse geographical coverage of the sample across 15 countries.

Table 6: Regression Results for Islamic and Conventional Banks (Random Effect Model)

PROFIT	-0.583***	0.092**
CAP	0.053**	0.024***
B SIZE	-0.233*	-0.002
CR	-0.004	0.001**
Constant	7.258***	1.123***
Adj. R^2	0.124	0.526
F-Stat	4.977***	53.027***

p < 0.05, p < 0.01, *p < 0.001

The results from the Random Effect Model show that in Islamic banks, profitability negatively impacts liquidity, indicating that as profitability increases, liquidity tends to decrease, possibly due to the investment in less liquid, Sharia-compliant assets. This finding is consistent with the Trade-off Theory, which suggests that banks face a trade-off between liquidity and profitability (Eljelly, 2004). Capital adequacy is a significant positive determinant of liquidity, suggesting that better-capitalized banks have stronger liquidity positions, a result that aligns with findings by Munteanu (2012).

In Conventional banks, profitability positively influences liquidity, showing that profits are often reinvested into liquid assets. This finding is supported by the study of Al-Harbi (2020), which observed a similar positive relationship. Capital adequacy also positively affects liquidity, while credit risk negatively impacts it, reflecting the increased exposure to default risks associated with aggressive lending practices. This is consistent with the findings of Al-Homaidi et al. (2019), who noted that higher credit risk can erode liquidity in Conventional banks. Bank size, however, does not have a significant impact on liquidity in Conventional banks, suggesting that larger size does not necessarily lead to better liquidity management.

Discussion

The findings illustrate distinct liquidity management practices between Islamic and Conventional banks. Islamic banks tend to reduce liquidity as profitability increases, likely due to investments in less liquid, Sharia-compliant assets. This relationship reflects the constraints Islamic banks face in balancing profitability with the principles of Shariah law, which limits their investment options (Mokni & Rachdi, 2014). In contrast, Conventional banks reinvest profits into liquid assets, enhancing their liquidity, which is aligned with their broader investment strategies and diversified product offerings (Al-Harbi, 2020).

Capital adequacy emerges as a crucial determinant of liquidity in both banking systems, highlighting the importance of maintaining strong capital buffers to ensure financial stability. The positive impact of capital adequacy on liquidity suggests that well-capitalized banks are better equipped to manage liquidity risks, a finding consistent with existing literature (Munteanu, 2012). However, the impact of bank size and credit risk differs between the two types of banks. In Islamic banks, larger bank size negatively impacts liquidity, possibly due to the operational complexities and the need to comply with Shariah principles. On the other hand, credit risk significantly reduces liquidity in Conventional banks, reflecting their exposure to higher default risks associated with more aggressive lending practices (Al-Homaidi et al., 2019).

These findings contribute to the understanding of how Islamic and Conventional banks manage liquidity differently. The study highlights the challenges Islamic banks face in maintaining liquidity while adhering to Shariah principles and the contrasting approach of Conventional banks, which leverage profitability to enhance liquidity.

5. Managerial Implications and Recommendations

Based on these findings, it is recommended that Islamic banks develop more innovative Sharia-compliant financial instruments to enhance liquidity while balancing profitability. Both Islamic and Conventional banks should prioritize maintaining strong capital buffers to ensure financial stability. This is especially important for Islamic banks, which may face additional challenges due to the constraints of Shariah compliance (Mokni & Rachdi, 2014). Conventional banks should refine their credit risk management processes to mitigate the impact of high-risk lending on liquidity, aligning with the suggestions of Al-Homaidi et al. (2019). Policymakers and regulators should provide tailored guidelines that support effective liquidity management in Islamic banks, facilitating the creation of more liquid, Sharia-compliant investment opportunities. Additionally, banks should invest in financial technology solutions, such as blockchain and AI-driven analytics, to improve liquidity management and risk assessment capabilities. These technologies could offer more efficient and real-time solutions to the challenges of liquidity management, particularly in the rapidly evolving financial landscape.

The study's findings underscore the importance of a nuanced approach to liquidity management in different banking systems. Future research could build on these insights by exploring additional variables, such as macroeconomic factors and regulatory differences, that may influence liquidity. Moreover, expanding the sample to include more countries could provide a more comprehensive understanding of global banking practices. Finally, qualitative research could offer deeper insights into the decision-making processes behind liquidity management in both Islamic and Conventional banks, further enriching the field's understanding of these critical issues.

Conclusion

This study provides valuable insights into the determinants of liquidity management in Islamic and Conventional banks. The results indicate a negative relationship between profitability and liquidity in Islamic banks, suggesting that as these banks become more profitable, they may invest in less liquid assets, which are in line with Shariah compliance. This is consistent with the findings of Eljelly (2004) and Mokni and Rachdi (2014). Conversely, Conventional banks show a positive relationship between profitability and liquidity, indicating that profits are often reinvested into liquid assets, enhancing their overall liquidity position, as noted by Al-Harbi (2020). Capital adequacy consistently emerges as a critical factor in ensuring liquidity across both banking systems, though the impact of bank size and credit risk varies.

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Exploring the Impact of Managerial Coaching, Emotional Intelligence and Social Support on Employee Retention: The Mediating Role of Employee Resilience in Malaysian Public Healthcare

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Abstract: This paper explores the correlation between managerial coaching, emotional intelligence, social support, employee resilience, and retention among healthcare workers in Malaysia's public healthcare sector. Retaining healthcare staff has become a severe difficulty in the *BANI* (Brittle, Anxious, Non-linear, Incomprehensible) environment, worsened by the COVID-19 epidemic. The study suggests that managerial coaching, emotional intelligence, and social support are essential for developing resilience among healthcare workers. This resilience, in turn, impacts their ability to stay in their jobs. The study will employ a quantitative cross-sectional survey approach to examine the links inside specific public hospitals in Malaysia. The results are anticipated to offer a vital understanding of how public healthcare in Malaysia can strategically improve staff resilience and retention, guaranteeing the long-term viability of the healthcare workforce in a world after the pandemic. This study enhances our comprehension of the intricate processes that impact staff retention in the public healthcare industry, providing practical implications for policymakers and healthcare managers.

Keywords: *Employee Retention, Managerial Coaching, Emotional Intelligence, Social Support, Employee Resilience*

1. Introduction and Background

Employees are vital assets in both public and private organizations, as they play a crucial role in helping organizations accomplish their goals and objectives. The unique expertise, competencies, capabilities, and insights possessed by each employee are essential and can actively contribute to the organization's day-to-day activities and have a beneficial influence on the organization's overall goals and objectives (Zainal et al., 2022; Johennesse & Chou, 2017; Mangala & Ramachandra, 2017). However, in today's brittle, anxious, non-linear, and incomprehensible world known as the *BANI* world, public healthcare in Malaysia faces adversity in retaining healthcare workers in the public healthcare sector.

In 2020, Jamais Cascio developed the *BANI* world; he provided a detailed explanation of his approach to reality and discussed the current state of the world during the pandemic. He elucidates his theory by outlining the conditions of existence in a pandemic reality using the BANI model. Musiol (2022), a philosophical psychotherapist, shared in her journal that the BANI world exists due to the COVID-19 pandemic, the ongoing effects of a pandemic caused by the SARS-CoV-2 coronavirus continue to influence our environment, and the *BANI* world makes it quite challenging for the government to retain healthcare workers in public hospitals.

Public healthcare systems are essential for guaranteeing fair and equal access to medical treatments, especially for lower-income individuals. Mulcahy et al. (2021) found that Higher government expenditure on healthcare is linked to a decrease in the utilization of private medical providers, especially among individuals with lower incomes. This suggests that investing public funds in healthcare services can help alleviate inequality in accessing healthcare. According to Govender et al. (2021), People with lower incomes frequently select public healthcare systems because they are affordable and convenient. However, some may choose private treatment for perceived higher quality and convenience. This underscores the significance of public healthcare in delivering easily obtainable treatments to individuals unable to pay for private medical treatment.

This study investigates the relationship between managerial coaching, emotional intelligence, and social support contributing to employee resilience among healthcare workers in Malaysian government hospitals,

ultimately impacting employee resilience and retention. Public healthcare systems are vital in addressing socioeconomic disparities by providing affordable and accessible care and reducing financial strain on lower-income families. As essential components of a nation's healthcare framework, public hospitals safeguard public health and ensure well-being. Effective strategies and robust health system governance are crucial for improving the quality and accessibility of public healthcare, particularly as populations age and the need to cater to older adults increases. Retaining healthcare workers in public hospitals is critical for maintaining a robust healthcare system that benefits all citizens, especially those in lower-income groups.

Problem Statement

The COVID-19 epidemic has had a profound impact on Malaysians, resulting in substantial mental health difficulties. Numerous individuals have experienced the unfortunate loss of family members or employment, leading to heightened levels of anxiety, stress, and sadness. The Public Service Department, led by Tan Sri Mohd Khairul Adib Abd Rahman, implemented the Holistic Well-being Inventory (IKH) to evaluate the mental well-being of federal personnel. This tool assesses six key dimensions of well-being: emotional well-being, overall life satisfaction, psychological functioning, social well-being, occupational well-being, and mental health.

According to Berita Harian, the Ministry of Health's Mental Health and Psychosocial Support Service (MHPSS) offered psychological assistance to 64,366 individuals during the Movement Control Order (MCO) period. According to Mohd Khairul Adib's report, as of September 2020, more than 15,000 civil servants had undergone counselling, and 22.5% of the population had sought Psychological First Aid (PFA) services for health-related issues. Healthcare personnel, as reported by Tharanya Arumugam in the New Straits Times in 2021, have been greatly affected, with a substantial number displaying symptoms of intense stress or burnout.

According to a report by Bulletin TV3 on February 1, 2023, 95% of 1,652 healthcare professionals, including government physicians and nurses, believed the nation's public health system is currently experiencing a crisis. Moreover, 73% of individuals contemplate resigning, while 80% of participants in the CodeBlue health news website study concur that their compensation is insufficient, and 78% voice apprehensions regarding overwhelming workloads.

Amidst the pandemic, healthcare personnel have encountered substantial mental health difficulties. Therefore, it is imperative to investigate methods to bolster resilience and improve staff retention. This study examines the influence of managerial coaching, emotional intelligence, and social support on employee resilience and retention. It aims to identify effective treatments to assist employees in coping with ongoing problems and maintaining a stable workforce.

2. Underpinning Theory

Job Demand Resource Theory

The Job Demand-Resource (JD-R) Theory is a theoretical framework that explores the connections between employee satisfaction, job efficiency, and organizational achievements. The concept, initially laid forth by Demerouti et al. (2001) and subsequently expanded to encompass several work-related factors, posits that the combination of job demands and job resources has a cumulative effect on employee stress and motivation, eventually influencing organizational performance.

The intricate nature of healthcare jobs in Malaysia's public healthcare system has been amplified by several factors, including the rising need for patient-centered care, the extensive use of new medical technologies, collaboration among healthcare professionals, and the emergence of contagious diseases. The continuous existence of COVID-19 and other potential health risks enhances this intricacy. The study is primarily based on the JD-R Theory, which offers a complete viewpoint on the impact of managerial coaching, emotional intelligence, and social support on employee retention in Malaysia's public healthcare sector.

The study also investigates the role of employee resilience in mediating these correlations. The theory builds upon the Job Demand-Control (JDC) model created by Karasek in 1979 and the Effort-Reward Imbalance (ERI) model introduced by Siegrist in 2002. The JD-R Theory offers a more inclusive framework compared to earlier models, as it considers both the positive elements (resources) and negative elements (demands) of work environments. The JD-R Theory, formulated by Arnold Bakker and Evangelia Demerouti in 2016, is a well-

recognized framework that explores the relationship between job demands, job resources, employee well-being, and work-related outcomes, including resilience and retention. The theory suggests that every occupation involves specific demands (such as workload, time constraints, and emotional pressures) and resources (such as social support, autonomy, and feedback). While job demands can exhaust people and cause stress, employment resources can help alleviate these negative impacts and foster personal development and progress.

Demerouti and Bakker (2023) highlight the crucial role of leaders in providing resources and facilitating communication during challenging times to handle uncertainty and boost employee motivation effectively. Indispensable job resources are required to efficiently manage workplace demands, enhance work engagement, and sustain well-being. Evangelia Demerouti researches several aspects of performance and well-being, covering many issues, including the JD-R model. Furthermore, implementing inclusive leadership can positively impact psychological distress in difficult circumstances. This highlights the interconnectedness of personal and professional aspects, as significant life events can impact an individual's dedication and efficiency in their job.

According to the JD-R Theory, employees exert control over their job settings by efficiently handling the requirements and assets of their occupations. Job demands require constant dedication with a chance to induce stress and weariness if not effectively managed—however, employment resources aid in achieving work goals, reducing job pressures, and promoting personal development. The interaction between job requirements and available resources substantially impacts employee drive, achievement, and well-being. Sufficient employment resources mitigate the negative effects of challenging job requirements, leading to enhanced employee commitment and flexibility. The equilibrium, influenced by factors such as the quantity and kind of job requirements and resources, personal resources of individuals, and organizational support, plays a crucial role in employee retention and enhancing well-being.

Social Exchange Theory

The conceptual foundation of Social Exchange Theory (SET) is derived from the pioneering research undertaken by scholars such as George Homans, Peter Blau, and Richard Emerson throughout the mid-20th century (Homans, 1958; Heath, 1971). These scholars explored the fundamental principles that govern social interactions. Originally driven by economic principles, these scholars viewed many social interactions as similar to "benefit exchanges," mimicking monetary transactions. Homans made a vital contribution to the development of Social Exchange Theory by suggesting that social activity can be understood as the exchange of tangible and intangible resources, such as goods and services, as well as social approval (Homans, 1958; Cole et al., 2002). As the theory progressed, scientists delved deeper into its core concepts, examining the roles of authority, influence, and the creation of small-scale organizations within the larger framework of social trade (Homans, 1958).

Blau's research focused on how power imbalances in social interactions affect employees' resilience to adversities and their likelihood of staying with the organization. Particularly, individuals who hold abundant resources or possess significant influence tend to have greater authority over the method of exchange, which might impact the level of loyalty that employees have towards staying with the business (Homans, 1958). Emerson's research on network architectures demonstrates the impact of exchange mechanisms inside an organization on the distribution of resources and authority among individuals. The interaction of network variables can either enhance or hinder an employee's ability to cope with challenges and maintain commitment, therefore affecting employee resilience (Cole et al., 2002).

This study used Social Exchange Theory as its main theoretical framework to examine the influence of managerial coaching, emotional intelligence, and social support on employee retention in Malaysia's public healthcare sector. The circumstance involves an examination of employee resilience as a mediator. The study tries to understand the interactions and collective impact of these variables on the retention of healthcare personnel using this theoretical framework. The study investigates the influence of managerial coaching on the improvement of employees' skills and fulfillment in their jobs. It also explores how emotional intelligence creates a supportive and empathetic work environment. Additionally, the study evaluates the impact of social support in lowering workplace stress and increasing resilience. The aim is to provide pragmatic and valuable

information that may guide decision-making and tactics to improve the effectiveness of Malaysia's public healthcare sector and bolster employee retention.

3. Literature Review

Employee retention is the deliberate and intentional implementation of measures to motivate employees to remain with an organization for a prolonged duration (Naz et al., 2020; Yang et al., 2021; Krishnamoorthy & Aisha, 2022; Zainal et al., 2022; Ngah et al., 2024). Additionally, it is connected to the workers' inclination to stay in their present positions, which is impacted by the incentives and assistance they are provided with (Das & Baruah, 2013; Naidu et al., 2023). Comprehending this pivotal signal is essential as it offers valuable insights about employees' pleasure with their work, their degree of dedication, and their overall involvement with the organization. Multiple studies have investigated the variables that influence employee retention in different industries. It is crucial to comprehend the precise aspects that affect the public healthcare sector, as it poses distinct problems for its staff. Studies have investigated factors influencing employee retention in several demographic categories, including pharmaceutical staff (Zaman et al., 2021) and nurses (Matsuo, 2021).

Supervisory assistance is a well-acknowledged characteristic that significantly impacts employee retention in various businesses and geographic areas. The literature has extensively shown the significant influence of supervisory assistance on employees' career satisfaction (Matsuo, 2022), commitment (Kyei-Frimpong et al., 2023), and retention (Kaur & Mittal, 2022) in organizations. According to Ladyshewsky (2010), managerial coaching is essential to supervisory support. In 2009, the European Foundation for Management Development (EFMD) and the European Mentoring and Coaching Council (EMCC) highlighted five primary advantages of coaching: "enhanced performance," "heightened motivation," "strengthened team cohesion," "greater employee retention," and "improved conflict resolution." Additionally, their study revealed that coaching is mainly offered to managers and individuals who are recognized as having high potential within the company's talent pool.

Although there has been considerable research on the influence of supervisory support on employee retention, there remains a notable lack of understanding of the precise function of managerial coaching in this particular setting. Therefore, researching the correlation between managerial coaching and staff retention in the public healthcare sector should offer the government helpful knowledge as it pursues efficient approaches to improve employee retention.

According to Ellinger (2003), coaching is not a manager's responsibility and does not necessitate extra exertion. Additionally, it can foster a tendency among employees to disregard their job duties and neglect their obligations to manage their time effectively. Ali, Raza, Ali, and Imtiaz (2020) contend that managers must prioritize the assistance and advancement of their workers. Additional investigation is required to explore this topic further. Concurring with the viewpoints of Ali, Raza, Ali, and Imtiaz, it is imperative to recognize that managers have a vital responsibility to promote the growth and advancement of their staff. Managers must possess a high level of positive energy to coach their personnel correctly. This state of mind can be expressed as immediate emotional responses to certain occurrences or enduring emotional conditions unconnected to specific circumstances. It is a type of pleasant emotional stimulation described by Quinn and Dutton in 2005.
Energy can be understood as having motivational effects, influencing an individual's decision-making and the effort they invest in their actions. Positive emotions signal the appeal of other options, which affects the effort someone is willing to exert. People typically put consistent effort into activities they believe have sufficient energy (Quinn & Dutton, 2005). Managers can support employees during challenging times by engaging in managerial coaching, which includes empowering them, offering helpful advice, providing moral support, and giving constructive feedback. This approach helps employees recognize the effectiveness of their efforts, reducing stress and building greater resilience. This research examines the complex relationship between managerial coaching and employee resilience, highlighting the importance of understanding how managerial coaching influences resilience to grasp workplace challenges and support systems better. Thus, the following hypothesis is proposed:
H1: Managerial coaching positively influences employee resilience

Emotional Intelligence (EI) is a vital factor in employee retention within the public healthcare sector because it involves the ability to recognize, understand, express, and regulate emotions in oneself and others, significantly influencing various aspects of life (Coronado-Maldonado & Benítez-Márquez, 2023). While competitive salaries and benefits are essential, healthcare workers face unique challenges beyond financial compensation. The demanding nature of the job, including long hours, limited family support, and high-stress environments (Marzo et al., 2022), can lead to higher turnover rates. Therefore, healthcare workers need strong emotional intelligence to manage these challenges effectively, which can help reduce turnover and enhance retention (Binsaeed et al., 2023).

A study by Macaleer and Shannon (2002) highlights the significant role of Emotional Intelligence (EI) in the overall success of organizations. Emotional intelligence is crucial for employers and employees (Papoutsi et al., 2019). Those with high emotional intelligence are better equipped to navigate the complex social interactions in the workplace. By developing these skills, individuals can improve their interpersonal relationships, manage stress more effectively, and show greater resilience in difficult situations (Drigas & Papoutsi, 2019; Doğru, 2022; Coronado-Maldonado & Benítez-Márquez, 2023).

Emotional intelligence is crucial for increasing employee resilience. It enables employees to navigate workplace problems effectively by increasing self-awareness, managing emotions effectively, and improving relationships with others. This leads to a workforce that can withstand and adjust to challenges. Emotional intelligence is crucial for enhancing the resilience of healthcare workers who encounter distinct obstacles in their duties. According to Aránega, Sánchez, and Fernández-Vázquez (2021), emotional intelligence (EI) boosts employee resilience by bolstering confidence in their capacity to adjust and excel in uncertain circumstances. Healthcare professionals with high emotional intelligence demonstrate superior self-awareness of their emotions (Littlejohn, 2012), identification of stressors (Asiamah et al., 2016), and comprehension of elements that can lead to fatigue or emotional exhaustion.

Employees who are fatigued and experiencing burnout may face challenges in delivering optimal patient care. This is a prevalent problem in the present government healthcare system, as certain personnel find it hard to hide their exhaustion from excessive workloads. Recognizing the significant demands of their roles and refraining from unfairly attributing blame to these obstacles is crucial. Healthcare personnel must possess robust emotional intelligence to effectively manage the impact of interpersonal pressures on emotional tiredness, affecting their performance and client satisfaction.

This entails keeping composure and providing exceptional service, even while interacting with complex patients who challenge their patience. This study investigates the substantial correlation between emotional intelligence and the ability of employees to bounce back from challenges and setbacks. Gaining insight into the impact of emotional intelligence on employee resilience is crucial for understanding workplace difficulties and adaptive strategies. Thus, the subsequent hypothesis is put forward:
H2: Emotional Intelligence positively influences employee resilience.

Social support from colleagues is another crucial factor in fostering a positive attitude that enhances employee resilience and retention. Social support has long been a critical topic in management and organizational behavior, with research highlighting its significant impact on employee well-being, job satisfaction, and overall business outcomes (Reblin & Uchino, 2008). Social support can come from various sources, including informal networks like family, friends, coworkers, and supervisors, and more formal support systems such as healthcare professionals and human service workers (Glanz et al., 2008). In the public healthcare sector, understanding the complexities of social support among healthcare workers is particularly important due to the sector's significant challenges in employee retention and resilience. This study will focus on the social support provided within informal networks, particularly among coworkers.

Okojie et al. (2023) assert that employees who possess resilience can expedite their recuperation from hardship and efficiently cope with stress by utilizing social support systems. Resilience pertains to the psychological aspect, whereas social support refers to employees engaging in conversations with their peers to address their issues and concerns. During challenging periods, employees frequently require a confidant with whom they can communicate their emotions since their coworkers can relate to their circumstances and

comprehend their diminished drive. Emotional contagion, as described by Herrando and Constantinides (2021), refers to the phenomenon where one person's emotions affect and impact the emotions of those around them, resulting in the experience of shared emotional states, whether they are happy or bad.

Numerous studies indicate that social support is vital for building organizational employee resilience. For example, research at the Social Security Organisation (SOCSO) in Kedah, Malaysia, found a strong correlation between employee resilience and social support (Zakaria et al., 2023). Additionally, educators in private colleges benefit significantly from the support of family, leaders, and colleagues. Social support fosters trust, friendships, and information exchange, enhancing an employee's resilience in adversity (Okojie et al., 2023). This study will examine the link between social support and employee resilience, aiming to better understand social support's impact on workplace challenges. Thus, the following hypothesis is proposed:
H3: Social support positively influences employee resilience.

Adversity is an inevitable part of life, which is also valid for life within an organization. Organizational academics from several fields have developed an interest in resilience, which refers to coping with challenges due to the growing complexity of work stresses and rapid organizational change (Richard, 2020). Employee resilience is significantly influenced and improved by the presence of robust social support systems. It establishes a work environment where individuals can face challenges, recover from setbacks, and steadfastly commit to their professional obligations, aided by positive relationships and networks. Ultimately, this contributes to the achievement of organizational objectives and the improvement of employee well-being.

The healthcare sector is not an accessible sector in which to work. It involves human life, and the pressure that healthcare workers face daily, the long working hours, and the commitment they give to their patients make it difficult. Therefore, healthcare workers must be highly resilient to ensure they provide their patients with the best service. As highlighted by Baker et al. (2021), resilience is a crucial competency that employees must cultivate to effectively overcome the diverse obstacles encountered in the workplace, such as excessive workloads, traumatic incidents, and other forms of adversity.

According to Cooke, Cooper, Bartram, Wang, and Mei (2019), resilience refers to an individual's ability to effectively adapt to new situations and restore balance in the presence of significant challenges. Resilience refers to the ability to maintain or repair one's mental well-being in adversity (Herrman et al., 2011). Based on the definition, employees need resilience to maintain efficiency if the job is highly stressful. According to Norman Garmezy, his research on academic resilience led him to conclude that a particular aspect of resilience has a more significant impact on mental health than previously believed.

Resilience in the workplace can be defined as the capacity not only to endure but also to develop in demanding and stressful conditions. This is because, in high-pressure settings, such as a professional environment, individuals are frequently faced with conflicting expectations from colleagues and supervisors, necessitating the need to maintain composure and respond positively. Resilience on the job is a highly advantageous quality that enables individuals to maintain concentration and productivity while handling challenging conditions effectively. Change is increasingly becoming a standard practice in numerous enterprises and the healthcare sector. Research has affirmed the significance of employees in effectively dealing with change (Bardoel et al., 2014). According to the study conducted by Bardoel et al. (2014), resilient persons demonstrated a higher ability to adjust to work conditions that were continually changing.

Healthcare workers must cultivate resilience when they encounter several crucial situations while ensuring the well-being and survival of their patients. Simultaneously, they must deliver accurate medical treatments for the cases they encounter regularly, as human lives are a concern. Addressing instances where patients may not survive despite the best efforts of medical professionals presents complexity, as these circumstances involve considerations of mortality. Humans find it inherently challenging to handle such challenges due to the profound emotional and existential aspects involved when lives are at risk.

Studies have shown that the ability of staff to bounce back from challenges, known as resilience, is crucial in the healthcare sector. It allows for the establishment and maintenance of a stable environment that facilitates rapid adjustment in the face of unforeseen dangers (Liukinevičienė & Blažienė, 2022). This research will

investigate the relationship between employee resilience and employee retention. Understanding how employee resilience influences employee retention is integral to comprehending the challenges in the current workplace. Thus, the following hypothesis is suggested:
H4: Employee resilience positively influences employee retention

In today's job market, individuals can choose their employers based on their skills and expertise. To retain a talented workforce, organizations must focus on keeping their employees. High-quality employees are crucial as they provide a competitive edge, making their skills and knowledge highly valuable. The success of an organization relies on having the right people, and in this context, employee resilience—defined as the ability to handle pressure, overcome adversity, and maintain psychological well-being—has become increasingly important (Näswall et al., 2019). This attribute is essential for navigating the complex demands of modern workplaces (Mulyono et al., 2024).

The Job Demands-Resources (JD-R) Theory, introduced by Demerouti et al. (2001), suggests that every job includes both resources (like autonomy and managerial support) and demands (such as workload and time constraints) that affect workers' performance and well-being. Managerial coaching, as a resource providing guidance, feedback, and support, plays a critical role in employee retention by making employees feel valued and supported, which enhances their commitment to the organization. Employee resilience mediates in this relationship, helping individuals adapt and succeed in facing challenges. Effective managerial coaching fosters resilience, enabling employees to manage changes, handle stress, and overcome obstacles more effectively. As resilience grows, employees can better manage their responsibilities, leading to increased job satisfaction and reduced turnover intentions. Therefore, by enhancing resilience through coaching, employees' ability to handle challenges is improved, and their dedication to the organization is reinforced, thereby amplifying the positive effects of coaching on retention.

Social Exchange Theory, developed by Blau (1964), posits that workplace relationships are built on reciprocal exchanges of resources and support. Managerial coaching involves the strategic allocation of resources by managers to support their employees' development and well-being. Managers investing time and effort into coaching fosters a sense of reciprocal engagement and trust. Managers need to bring positive energy to coaching because interpersonal interactions can trigger emotional responses through emotional contagion, where one person's emotions influence another's. Employees who feel recognized and supported are likelier to commit their efforts and loyalty to the organization. They are also more inclined to develop resilience when they perceive their work environment as conducive to personal growth.

Research shows a strong link between employee and organizational resilience, emphasizing the role of employee resilience in maintaining engagement and performance (Liang & Cao, 2021). Management coaching is crucial for developing resilient behaviors in employees, which affects retention rates (Caniëls & Curseu, 2024). Resilience acts as a mediator by lessening the negative impacts of job stress and enhancing the benefits of coaching. Resilient employees manage job constraints, setbacks, and uncertainty more effectively, displaying higher flexibility, optimism, and emotional intelligence, which helps them sustain high performance and engagement (Luthans et al., 2006). Thus, resilient employees are likely to view management coaching as valuable and effective for their growth and well-being, leading to increased retention rates. JD-R and Social Exchange Theory offer valuable insights into how employee resilience mediates the connection between managerial coaching and employee retention. Organizations may boost coaching effectiveness and promote employee well-being and commitment by comprehending the impact of coaching on resilience and retention and establishing supportive work environments.
Thus, based on the JD-R model and Social Exchange Theory, this study puts forward the following hypothesis:
H5: The connection between managerial coaching and employee retention is influenced by employee resilience.

4. Research Methodology

The study employs a quantitative cross-sectional survey methodology to explore the relationships between managerial coaching, emotional intelligence, social support, employee resilience, and employee retention. This approach involves a thorough examination of these variables at a single point in time across public hospitals in Malaysia that are engaged in treating COVID-19 patients. The sample includes six hospitals from different regions: three from the central area (Hospital Sungai Buloh, Hospital Kuala Lumpur, and University Malaya Medical Centre), one from the southern region (Hospital Tunku Jaafar Seremban), one from the eastern region (Hospital Tengku Ampuan Afzan), and one from East Malaysia (Hospital Umum Sarawak). This diverse selection aims to provide a well-rounded understanding of the research objectives within Malaysia's dynamic public healthcare sector.

Data will be gathered through structured questionnaires designed to assess key factors such as managerial coaching, emotional intelligence, social support, employee resilience, and retention. These surveys will be distributed across various departments and levels of administration within the hospitals to ensure a broad and representative sample. Once collected, the data will be analyzed using PLS (Partial Least Squares) Structural Equation Modelling to evaluate both the direct and indirect effects of the studied variables. This methodology is tailored to ensure accuracy and consistency throughout data collection, processing, and analysis, facilitating a thorough investigation of the relationships within the selected organizational contexts.

5. Conclusion

This conceptual paper highlights the importance of managerial coaching, emotional intelligence, and social support in enhancing employee resilience and retention in Malaysia's public healthcare system. Healthcare workers are facing more difficult barriers in the *BANI* environment. These factors are increasingly vital in helping individuals handle their occupations' requirements effectively, maintain their overall health, and be committed to their organizations.

The study predicts that more intensive managerial coaching, heightened emotional intelligence, and improved social support will increase employee resilience. Resilience is anticipated to decrease turnover rates since resilient individuals are more inclined to remain dedicated to their positions despite the stressful and demanding healthcare environment. The anticipated results encompass a more lucid comprehension of the interplay between these elements in enhancing employee retention, providing flexible insights that might inform public hospital policy decisions and management practices. Enhancing the capacity to bounce back and adjust through focused interventions in coaching, emotional intelligence, and social support is vital for sustaining a dedicated and proficient healthcare workforce, thereby improving the overall effectiveness and durability of Malaysia's public health system.

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The Role of Gender in Managing Finances among Newly Married Couples in Klang Valley, Malaysia

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Abstract: This study explores the couple's role in managing finances and marital satisfaction from the perspective of newly married couples. By delving into individual demographic and behavioral segments, we reveal how couples manage and plan finances to achieve financial well-being and marital satisfaction, further identifying the role of gender in household financial management. Through a phenomenological method, we conducted semi-structured interviews with seven middle-income newly married couples residing in Klang Valley. Interviews with informants took 6 months between February 2022 and July 2022. The duration of the interview is between sixty and ninety minutes. The interpretation of qualitative data was analyzed thematically using N-Vivo 13 software. The results of the study shed light on the couple's financial management practices to achieve financial well-being and marital satisfaction. The husband is the main pillar in the household's financial affairs. This study offers value in the enrichment of data that reveals couples' understanding of managing finances and plans for their future. By focusing on newly married Malay couples, we gained a deeper insight into simple strategies implemented by household financial managers, division of financial responsibilities, and course of action. Findings that reveal the understanding and behavior of middle-income newlyweds in the Klang Valley towards financial well-being can be used by policymakers, governments, and non-governmental organizations to formulate financial health policies, programs, and campaigns to educate the public about early planning towards financial well-being and enjoying marital satisfaction.

Keywords: *Financial management, family resource management, marital satisfaction, newly married couples, qualitative method*

1. Introduction and Background

The post-pandemic era shows the struggle of households in trying to meet daily needs while adapting to the increase in the price of goods and the cost of living where the rise in income is unable to cope with the rate of inflation. In a situation where many people live paycheck to paycheck, the wages earned at the beginning of the month seem to disappear overnight before the end of the month often leading to financial stress and problems in marriage.

The Department of Statistics Malaysia in November 2023 recorded that the divorce rate increased by 43.1 percent in 2022 compared to the previous year and divorce among Muslim couples was the highest. Although there have been many cases of divorce in the past, it has continued to increase since the COVID-19 pandemic hit the country and the implementation of the movement control order (MCO) which hampered economic movement to the point of affecting household income is seen as the biggest cause of divorce (Parzi, 2021). Selangor recorded the highest number of 12,479, followed by Johor (7,558); Kedah (5,985), Kelantan (5,982), Perak (5,921) and 5,098 in Terengganu (Sinar Harian Online, 2021). In addition to finances being the main issue of domestic conflict, the National Population and Family Development Board's (LPPKN) study in 2021 also recorded emotional stress, depression, work arrangements, and domestic violence as the cause of the increase in divorce rates.

Although four years have passed, the community is still struggling in the post-pandemic era with economic uncertainty that affects well-being and quality of life. Well-being includes physical and mental health, happiness, and life satisfaction. Marriage is one of the ways to experience a purposeful life, happiness, and peace of mind where life feels more meaningful. However, marital satisfaction is a complex phenomenon that

is influenced by various factors including personality characteristics, communication, conflict resolution, and economic stability (Abolghasemi et al, 2024). Financial well-being (FWB) is one of the factors that determine the quality of life. It refers to the sustainability of individuals in ensuring that needs are met and the comforts of life are enjoyed without worry due to sufficient income and savings (Carton et al, 2022). An individual's perception of FWB depends on the current financial position which involves the adequacy of income to cover expenses, savings, emergencies and future security. In addition, knowledge related to financial products, financial services and the availability of formal and informal finance also influence individual perceptions. (Fu, 2020).

For newly married couples, Saxey et al. (2024) found that finances have a direct relationship with marital satisfaction. According to Falahati and Sabri (2015), many young adults are unable to manage their spending wisely and thus fall into financial stress. According to Frączek and Klimontowicz (2015), young people lack financial knowledge and financial skills causing them to be weak in financial literacy. Relationship satisfaction is achieved when partners share financial values (Mao et al, 2017). However, possessions and financial values can also undermine satisfaction in relationships (Ward et al, 2021; Yoo et al, 2021). This research seeks to reveal how newly married young couples (NMC) manage money and financial conflicts based on family resource management theory to distinguish the couple's future financial motivations that affect marital satisfaction by taking into account the roles played by husbands and wives.

2. Literature Review

As early as the household model was formed, Becker (1981) and McElroy and Horney (1981) suggested that couples would choose and perform household tasks based on comparative advantages whilst financial decisions were made through negotiation. The division of household tasks includes psychological and sociological factors, contractual relationships, and finances (Antonides, 2011). Meanwhile, recent studies show that there is an unequal division of tasks between couples (Ciciolla & Luthar, 2019). These tasks include household budgeting, planning family activities, anticipating future needs, delegating tasks, and prioritizing and reviewing outcomes (Robertson et al, 2019). Several past studies showed that the value of income influences power in determining household financial decisions. Husbands who usually have higher incomes have higher control over household finances (Alsemgeest & Grobbelaar, 2015; Antonides, 2011; Friedberg & Webb, 2006; Grossbard-Shechtman, 2003).

According to Cheraghian et al. (2024), the existence of a household financial manager and the ability to balance income and expenses can result in marital satisfaction. Preceding research (Cooper & Zhu, 2016; Elder, 2003; Hilgert & Hogarth, 2003; Johnston et al, 2015; L'Esperance, 2019) suggested that age, education, employment, and wages are important factors that determine who had the most power to 'holds the purse strings'. In West Bengal, age, occupation, and family type determine women's participation in household financial affairs showing that their involvement is higher for those living in urban than in rural areas (Biswas et al, 2020). Majlesi's (2016) study of Mexican households shows that working-class wives can make financial decisions related to medical costs and children's health. In fact, according to L'Esperance (2016), higher-income wives tend to handle most of the financial tasks that include paying bills, managing savings and investments, shopping, and preparing family budgets.

There are three methods of making financial decisions in dual-income families in Malaysia; done alone by the husband or wife and done jointly by the husband and wife (Zaimah et al, 2015). Josephson (2017) found that households who practice partial pooling with no full family insurance, insure each other for essentials (food, clothing, education, and healthcare) but not luxury items (cigarettes, alcohol, recreation, housing, and utilities). Bertocchi et al. (2014) stated that household financial decision-making depends not only on economic differences between the spouses but also on human capital and experience differences.

Family Resource Management Theory

The household economic model suggests that marriage is closely related to the allocation of resources where couples benefit from joint consumption (Dupuy & Galichon, 2014; Lundberg, 2012). Chen et al. (2012) indicated that when couples coordinate their respective resources including emotions, finances, information, and services together to meet each other's needs, it is a process of family resource management. When it comes to

household financial decisions, it usually focuses on where, by whom, how much, and why it is necessary and has been spent. (Kamleitner et al, 2016).

Family resource management theory was initiated by Deacon and Firebaugh (1988). It conceptualizes the framework of household financial management by emphasizing that resource planning and implementation is the management of family resources to meet household demands. In the household, there needs to be a financial manager who manages all the family's resources, not just the allocation of money. This theory emphasizes that their responsibility is to allocate resources wisely to achieve financial objectives. To achieve financial well-being and optimize satisfaction, couples need to divide household tasks (Perry-Jenkins, 2020). The division of financial and household tasks is closely related to social factors implementation among couples is quite difficult but not impossible to do with the discussion, especially for low- and middle-income groups (Carlson et al, 2018). This is because to increase household resources, outsourcing was also done and to maximize satisfaction, market substitutes for domestic work such as cleaning, cooking, and taking care of children are used (Kornrich & Roberts, 2018).

Nuclear families consisting of parents and children are found to be more efficient than extended families (living with in-laws) in allocating household economic resources (Kazianga & Wahhaj, 2017). Therefore, the allocation of resources such as land and farms received by the nuclear family is greater than the extended family. As noted by Atwood (2012), marital satisfaction is influenced by the household economy where the spouse's economic achievement is crucial. In a conventional household, the husband plays the main role in managing and controlling finances (Bisdee et al, 2013). However, according to Pahl (1995), although the main breadwinner in most households is the husband and the wife often acts as a supporter in helping the family economy, in most situations, the wife still prioritizes the needs of the family over her desire to spend her money.

In conclusion, family resource management theory suggests couples share resources and divide responsibilities to optimize resources. It is also used to see how NMC shares limited economic resources and distributes household financial responsibilities. Many previous studies have linked financial issues to divorce, discord in family relationships, and domestic violence (Cheraghian, 2024; Dean et al, 2009; Kerkmann et al, 2000; LeBaron-Black et al, 2024; Peetz & Joseph, 2024). Hence, identifying financial management practices and how to deal with financial conflicts of NMC is imperative to suggest that couples' behavior towards finances, money motives, and their understanding of financial well-being is closely related to a good marital relationship.

3. Research Methodology

Procedure

This study focused on seven newly married Malay couples from the M40 income category residing in the Klang Valley. Semi-structured interviews were conducted with couples together. Interviews with informants took 6 months between February 2022 and July 2022. The duration of the interview is between 60 to 90 minutes. Starting with a pilot study, the intensity sampling method paid attention to young adults aged between 25 and 35 years with a marriage duration between 3 to 5 years. Young adults according to the Malaysian National Youth Development Policy are those between the ages of 15 and 40. Before the interview, all informants were informed of the purpose of the study. They were given a confidentiality guarantee and asked to sign the consent form. The interview was conducted by the researcher with the assistance of a research assistant at the informant's home at the time and date agreed upon. Informants were given the option to answer questions in their preferred language. As informants chose to be interviewed in Bahasa Malaysia, bilingual translators' expertise was used to avoid ambiguity in understanding the content of the interviews.

Measures and Analysis

Data interpretation is guided by the family resource management theory. Besides focusing on financial management, plans and efforts to improve the level of income were also used as a foundation to formulate the research questions. Data triangulation and theory triangulation were carried out. The informants' statements were cross-examined through observation, field notes, and documents obtained from them. In addition, the convergence between theories also serves as additional validation. Maxwell (2013) stated that the results of qualitative studies are necessary for the construction of theory, but Saldana (2015) challenged this by pointing out that qualitative studies should be based on well-known theories. Hence, this study takes an approach to

comply with the view of Miles and Huberman (1994) in which, the presence of two theories may not necessarily provide perfect convergence, but partial convergence is adequate to support the anticipated connection through various researchers and participants at different times and situation. The study also conducted member checks as another validation technique which is a great tool for improving the credibility, authenticity, and accuracy of data.

Researchers used the methods proposed by Chenail (2011), Gray (2018), King and Brooks (2017), and Yin (2011) to slacken bias and to elude prejudice against the informants' statements. According to Yin (2011), transparency is imperative in explaining research procedures. Meanwhile, Chenail (2011) proposed an interview method to enrich the data. From simply taking 'explanations' to achieve the objectives of the study, King and Brooks (2017) suggest qualitative researchers 'understand' the meaning conveyed by the informant. Next, from simply putting assumptions to causes and actions, qualitative researchers need to take an interpretive approach, by translating and understanding the meaning of the informant's experience (Gray, 2018).

The instruments of inquiry are seven main semi-structured interview questions. Interviews were recorded using a Sony Stereo IC Recorder, model ICD-UX560F. Phenomenological methods were used in the transcriptional analysis (Eddles-Hirsch, 2015). The analysis was performed using N-Vivo 13. It involves two main stages. First, coding of phrases and second identifying relationships between themes emerged, which were identified in the first stage. When a connection between themes appears, the theme is clustered into a superordinate theme. Transcripts need to be read over and over again to make sure the themes that emerge reflect what informants want to convey. The excerpts extracted from the data were then examined according to a new theme using N-Vivo 13 software.

Descriptive and thematic analysis is the cornerstone of data analysis in this study. Descriptive analysis was a platform that provided a richer context through enhanced representation based on data from other angles of the studied phenomena (Given, 2008). Through descriptive analysis, the original dialogue was presented as support and evidence for the analysis made.

Data Saturation and Validation

The uniqueness of qualitative research lies in the enrichment of data collected from informants directly. Thus, sample size plays a minor role where data saturation is determined by the study element; until Repeated and reasonable information is reached and new information cannot be unearthed new data. The Collection is unnecessary (Saunders et al, 2018). In this study, data saturation is inferred through inductive logic; data is collected based on research questions and then analyzed based on theory. Qualitative studies emphasize the validity of data as a guarantee of the reliability, validity and accuracy of Results as evidence that the study is conducted ethically (Merriam, 2009). Qualitative studies emphasize the validity of data as a guarantee of reliability, validity and accuracy of results as evidence that the study is conducted ethically.

Table 1: Stages in the validation strategy

No	Validation stages	Procedures
1	Triangulation technique	Interviews are a source of primary data collection and observation is a source of secondary data to strengthen insights and results.
2	Members check	Tentative findings were confirmed by the informant through transcripts that detailed the narration during the interview.
3	Peer review	The researchers involved in this study conducted a review process using N-Vivo 13 by listening to the interview data, checking, comparing the data and forming categories. Data Coding was also done at this stage.

4. Results

The data explained through semi-structured interviews covers three phases; the existence of a household financial manager, the division of financial responsibilities, and the course of actions. The perspectives and approaches discussed resulted in themes that explained the role of couples towards their roadmap in pursuit

of FWB. Descriptive analysis with data enrichment allows the phenomenon of the study to be explained more deeply to achieve the objectives of the study.

Course of Action

In terms of resource management of household income, the primary theme that appears is the awareness to form an efficient way of managing inflows and outflows of money. Although both work and have their income, they still have a household financial manager who takes the initiative to effectively manage the household's money activities. The course of action results from the activities of financial managers who record expenses, keep proof of payment, and review expenses periodically. Financial managers use Excel sheets to track monthly finances and make annual financial plans. This simple technique is used to keep track of any large expenses that may occur once in a while. At the same time, it is a warning of the current financial position of the family. The financial review carried out periodically aims to ensure that the family's financial commitments are in order and that they are always prepared in the event of an emergency or unforeseen event. This method has been practiced by husbands since before marriage. The track made is to ensure loans and bills are paid on time. It also makes it easier for them to plan vacations and festival expenses. They keep these financial records on a laptop for easy future reference.

> *"…if you see my workstation in my office, I have an Excel sheet, yeah, even my wife, even she'll have a Headache if she looks at my Excel sheet. My spending every month, err, I will record, you know, okay, all. the amounts that I have spent." (Ahmad, couple 1).*

Their financial record data in an Excel sheet has details on regular expenses such as home bills, monthly debt commitments, and savings. The pattern of monthly expenditure for household needs rarely changes, therefore they do not go into detail. They recorded it based on categories such as grocery items, entertainment, clothing, and so on. Surprisingly, all the informants do not have a background in business and accounting. Throughout their university studies, they were not exposed to financial knowledge, nor did they ever meet with a financial advisor to learn the best way to record household finances. The initiative that was taken arose from financial awareness when seeing and reading about the situation of the community burdened with financial issues and involved with uncontrollable debt.

> *"Looking at other people. When we see our friends, using credit cards, the desire to spend is higher, Because they can buy on credit, and then, in the end, they get a letter, stating that they have been Blacklisted [for non-payment], that's what happens…". (Yusof, Couple 6).*

In addition, they also consider efforts to accumulate wealth and assets. It included planning for savings, investments, and future financial strengthening. With limited finances, they choose a safe investment plan. At the moment, three couples (couples 2, 3, and 7) were actively seeking information on gold bar investment. Couple 5 plans to start with ASB financing in which they believe that the annual dividends earned can be used to settle the monthly payments or used for other possible matters. Meanwhile, couple 1 is aiming to be involved in property investment and made a forecast for the expected income from the property business.

> *"hmm... nowadays there are many auction houses so he is interested in buying and renting. We went to The CIMB auction but for now there is no chance of winning yet". (Ana, Couple 1).*

Although the financial management model practiced by these couples seems less systematic, their determination to manage family finances can be emulated. Without the financial and accounting education background, they were striving to create the most easily understood system to track their financial flows. Despite less skill in terms of applying the convenience of the smartphone app, the husband, as the head of the family, took the initiative to design a recording system that made it easier for him to check on household expenses and debts. In terms of tracking expenses, this study is in line with Kaye et al. (2014) where they form a financial system that fits their daily routine although it is not an ideal notion it is an adequate financial management practice for them.

The Husband is a Household Financial Manager

This study revealed that all the couples interviewed had a household financial manager. Life in the post-pandemic era, they feel that managing finances is increasingly critical, not to mention the slightly reduced salary from before the pandemic and the price of goods being quite burdensome. Although all the informants have the same level of education; holders of a bachelor's degree from a local university, it turns out that the

husbands are more fortunate as they have a higher income than the wives. Although there is no clear statement or discussion between the couple, the husband is seen to have the power to manage the family's finances. They admitted that the discussion took place for the purchase of relatively expensive and large items such as new furniture, electrical items, kitchen renovations, and family vacation arrangements. However, the final decision for the financial budget is usually the husband's decision.

> *"Before I make any purchases, I will let him know, so, if he says "Err, this month, we need to save some. Money first", then I won't buy, if it's okay, then I'll buy it". (Fiza, couple 3).*
> *"For the big-ticket [costly items}, I will decide". (Faris, couple 3).*

The wife also plays a role in managing finances but it is more on a small scale such as the purchase of children's clothes and daily expenses. The wives explained that financial affairs are easier to hand over to the husband because the husband is more careful in comparing prices, more diligent in keeping records and checking expenses, also wiser in planning expenses and budgeting. Husbands are more rational in spending and always prioritize needs over wants. Although frugal in spending, when it comes to some important items, they will not compromise on the quality. Choosing quality items is more worthwhile because they are more durable. Although quality goods are quite expensive, these husbands are very clever in finding ways to buy them at a worthwhile price. They will choose quality goods at reasonable prices either online, using vouchers, coupons, or reward points collected from previous purchases. They prioritize their wives and children over themselves when shopping.

> *"…I buy second-hand items for myself, leather, durable, err, as long as it's wearable, that's okay, no. Problem. But, for her (wife) and children, at least, once a year I will withdraw some money and buy for Them and I choose the one that is of a good quality and course of their choice". (Haqem, Couple 4).*
> *"We want to buy… but we know, we can't afford it. So, what I do is… I do some research, and then I see, "oh… instead of paying RM3,000 at a boutique, we can buy it from a Malaysian [personal] shopper who buys items from the US, I see that it's less than RM1,000, maybe even just a few hundred only". (Ahmad, Couple 1).*

There is one thing in common among these financial managers, they like to delay spending. According to Them, this is a way to save money. But this postponement is only for items of desire, not necessity. The postponement was also made to spend some time to find a more economical alternative. It is very different from wives who like to make quick decisions in purchases. Impulsive buying situations mostly happens when the wife shops alone. However, when they do their monthly grocery shopping, they prepare a shopping list to avoid waste. These couples preferred to use cash against credit as a way to control spending. As a measure of frugality, price comparisons were made to get quality goods at reasonable prices. Nevertheless, during the promotion of cheap sales, the number of purchases increased. In addition to having a member card to collect reward points, they also choose grocery stores that offer low prices.

> *"Err… if for groceries… either Giant or Mydin. For clothing… err… usually… either Aeon or Sogo. We look for a cheap one but if [we] wanna buy clothes, like children's clothes, err… we choose the cheaper one, but It's still of good quality. We] didn't buy the latest products". (Dania, Couple 7).*

Although these informants are working couples with a moderate income, they admit that there are times when the monthly income cannot cover unexpected expenses. Hence the use of credit cards is sometimes necessary. However, only three couples have credit cards. Another four couple have their reasons for not using a credit card. For these three couples, only the husband has a credit card. Credit card use is limited to emergencies and relatively large expenses to accumulate reward points and avoid getting caught up in impulsive spending.

> *"…this credit card is mainly used for specific cases, for example, for car repair, immediately, you need RM2000 err, I don't have it, so, I pay using my credit card first". (Qazem, Couple 5).*
> *"CIMB and Maybank. The CIMB [card], I don't use it actually. The CIMB [card] is just for emergencies". (Yusof, Couple 6).*

The household financial manager is not appointed but it happens naturally based on trust and willingness. To take responsibility. This study highlights the need for a financially savvy person who is willing to make financial decisions to manage household finances. The role of the financial manager arises when one of the spouses is indirectly able to influence decisions involving large amounts of money. In addition, he must also, be knowledgeable about the family's financial assets. This study discovered that these couples. Implicitly

recognized that their husbands were the family financial managers. This finding was similar to Bisdee et al. (2013); Carlson et al. (2018); and Codod (2015). Bisdee et al. (2013) stated that traditionally, the husband's role was to manage family finances as this would manifest the credibility of a husband.

Division of financial responsibility

All the couples interviewed have one to two children except one couple who has no children. This working couple agreed to manage the household tasks together. Although the husband is the financial manager, the wife still has financial responsibilities. For these young couples, financial responsibilities include family expenses, childcare costs, and intergenerational transfers within immediate family members. Ensuring that basic needs are met is the husband's responsibility. The basic needs meant by them are in line with the theory introduced by Maslow (1943). Among the elements he emphasized were water, food, shelter, health, and safety. However, some fundamentals are agreed upon by all, which are not impossible to obtain, and the minimum requirements for life; are food, clothing, and shelter.

> *"Err… every month I pay the [mortgage] installments. Also, every month, I allocate another RM300 for Groceries, internet connection as well as our insurance". (Ahmad, Couple 1).*

In terms of food and clothing expenses for family members, all couples took different approaches. For couples 3, 4, and 5, the husband provided expenses for groceries and daily meals. While, for couple 2, the provision of groceries was the responsibility of the wife. Besides, Ahmad (couple 1), Khaliq (couple 2), Faris (couple 3), Haqem (couple 4), and Qazem (couple 5) explained that their income was also allocated for family medical needs. While for Yusof (couple 6) and Daud (couple 7) they not only shared in medical costs (if any, as they said, it was very rare) but they also shared childcare costs.

> *"…err… housing, food, err… illness, fever [healthcare], err… clothes, … that's my responsibility, …and then, For… err… hospital bills and electricity bills, I pay for all that. And then, she [Hani], the car that belongs to Her, she pays [for it], her makeup, she pays…". (Khaliq, Couple 2).*

Speaking of the distribution and use of the wife's income, all couples gave a similar pattern. They indicated that wives used most of their income for personal needs and to pay their debts. The wives have more debt commitments than their husbands before marriage. Among the debts that the wives brought into the marriage are vehicle loans, personal loans, and education loans.

> *"Groceries, his [responsibility] (looking at her husband while laughing). I have an education loan, PTPTN. Then I have a car loan. I've also taken an ASB loan, so I paid my loan only". (Dania, Couple 7).*

This study has found that wives have more debt brought into the marriage than husbands. All seven couples in this study each have their vehicle. However, none of the husbands had a new car, they all bought a used car when they started working. All wives buy new cars as soon as they work for the reason of commuting and therefore have car loans. All husbands also still use the old motorbikes that their fathers gave them when they were still studying. From this data, it is easy to conclude that husbands are more careful in spending. While the wife easily incurs debt. It turns out that the decision to divide financial responsibilities is based on the commitment and financial burden borne by the spouse. This finding is in line with Coelho (2014) where spouses are responsible for different categories of common expenses. This study also supports the findings of Hitczenko (2021) where making financial decisions is the responsibility of men because it is in line with higher household income. However, the additional data obtained from this study is the wife's financial position and the wife's behavior towards money is the main driver for the husband to manage the household finances.

Discussion

The objective of this study is to relate the role of gender in household money management in the post-pandemic era to examine how the methods implemented affect marital satisfaction and avoid financial conflicts. The informant is a working couple with a bachelor's degree from a local public university. The income range of the informant's household is between RM7,850 to RM12,500 per month. While the age range of informants is between 27 to 34 years. Each couple has at least one motorcycle and 2 cars. They rent a house in the Klang Valley with an estimated rent of between RM650 to RM800 per month.

The findings of the study show that all couples can meet basic needs. None of the couples were affected by the COVID-19 pandemic, but the increase in the price of goods made them more cautious in spending matters.

Family financial matters are the husband's responsibility where the husband will manage house rent, bill payments, and monthly groceries. Only three couples use credit cards that are limited to emergencies and contingencies where the husband is the holder. Husbands only have PTPTN financial loans but on average wives have long-term debts such as education loans, ASB loans, vehicle loans, and personal loans. Financial affairs are carefully organized by the husbands by recording the flow of money in and out, planning the expenses of family vacations and celebrations, and making and checking the annual budget for the children's schooling and family savings. Expenses involving a large amount of money will be discussed together and the husband will decide according to the sufficiency of money and the appropriateness of time. These results show that discussing and accepting decisions openly is a method of avoiding financial conflicts and resulting in healthy relationships and marital satisfaction. Effective communication between couples supports the study of Girma (2022) and Omoboye et al. (2024) where effective communication fosters resilience, resolves marital conflicts and increases marital satisfaction.

All wives put all their trust in their husbands for financial matters and they also have joint savings. This trust is the main key to marital satisfaction and can avoid financial conflicts. Wives are less concerned about the main financial affairs of the household and their wages are only used for the purchase of personal items and loan payments. Having a good and healthy perception also produces satisfaction in marriage. This is in line with Wondimu (2024) that positive beliefs in marriage are one of the factors that shape marital satisfaction.

5. Managerial Implications and Recommendations

This study intentionally focuses on newly married couples with moderate income residing in Klang Valley to identify their financial management practices in the post-pandemic era. Among the contributions of this study to newly married young couples is that managing finances prudently is very important to enjoy marital satisfaction and avoid conflict in the household. In a household where there are two individuals from different backgrounds, different thoughts, and different ways of living, there is a need for healthy communication and open discussion especially in financial issues. Women are known for their love of shopping, so as a husband you need to control and advise. In a marriage, there needs to be someone who can manage finances wisely and have clear future financial goals. This study also offers methodological implications by presenting a deeper understanding through first-hand information. Many studies related to financial management are carried out quantitatively but through qualitative methods, data enrichment is obtained not only through descriptive analysis but also through observation. It indirectly closed the literature gap by providing deep insight into these couples' understanding, beliefs, and feelings. Face-to-face interviews help us understand the meaning of the words conveyed by these informants through their facial expressions. Practices shared by the husbands in this study such as prioritizing needs over wants and methods of tracking finances can be used as a campaign to emulate. Policies for forced savings can be improved by policymakers to ensure that savings are made a must for society. This study suggests that policymakers, governments, and non-governmental organizations formulate financial health policies, programs, and campaigns to educate the public about early planning for financial well-being.

Conclusion

This study aims to identify the role of gender in household financial management. The husband with a higher Income and less debt were the financial managers of the household. The husband has the power in Determining major expenses and investments. For newly married Malay couples, men play an important role in managing household finances even though they are dual-income households. The wife also has a role but it is for daily expenses and involves a small amount. Indeed, among the factors that affect marital satisfaction are financial issues. Financial awareness and financial savvy form motivation towards financial well-being. The trust that exists between the couple and the future financial motives are discussed with the couple can Avoid financial conflicts in the household.

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The Influence of Extrinsic Motivation and Cross-Cultural Adjustment on Foreign Worker Commitment: The Mediating Role of Cross-Cultural Adjustment and Moderating Role of Employer Trust

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Abstract: Palm oil is a key income source in Malaysia, with the industry heavily reliant on foreign workers. This reliance necessitates a focus on their welfare to address workforce shortages. This study examines the relationship between extrinsic motivation and organizational commitment, mediated by cross-cultural adjustment and moderated by employer trust among foreign workers. This study employed a quantitative research design, using SPSS for data analysis, and surveyed 242 foreign workers from companies listed on the Malaysian Palm Oil Council (MPOC) website in 2022, achieving a 100% response rate. The key findings show that organizational commitment positively influences extrinsic motivation, with cross-cultural adjustment significantly enhancing both. Employer trust moderates the relationship between organizational commitment and cross-cultural adjustment, underscoring its importance in cultural adaptation and motivation. These insights highlight the need for targeted strategies to improve job satisfaction and retention among foreign workers by addressing extrinsic motivational factors and cultural adaptation challenges. The research contributes to the literature by detailing the interplay of organizational factors and cultural adaptation in shaping motivational outcomes, suggesting future research to explore longitudinal studies and other moderating variables. These findings offer valuable implications for improving workforce performance and retention strategies in the palm oil industry.

Keywords: *Extrinsic motivation, organizational commitment, cross-cultural adjustment, employer trust, foreign workers.*

1. Introduction and Background

As the global shift toward sustainable development progresses, organizations must balance societal, environmental, and economic goals (Thakhathi et al., 2019). Businesses face increasing pressure to adopt sustainable practices, as evidenced by the rise of sustainability reporting, with over 93% of Fortune Global 250 companies publishing such reports (International, 2017). However, these reports often conceal operational scrutiny (Nor Ahmad et al., 2022). The palm oil industry, significant yet controversial, is crucial to Malaysia's economy but faces potential EU bans due to environmental concerns (Naidu & Moorthy, 2021). In 2022, palm oil contributed RM116.3 billion to Malaysia's export revenue (Ministry of Plantations and Commodities, 2022). Despite its economic contributions, the sector suffers from labor shortages, with only 19% of the required foreign workers authorized to work in 2022.

Foreign workers play a vital role in Malaysia's economy, particularly in low-skilled jobs within the manufacturing, construction, and agriculture sectors (Wahab, 2020a; Lee, 2019). While immigration helps address labor shortages, reliance on foreign labor has led to challenges such as deindustrialization and policy enforcement issues (Orrenius & Zavodny, 2020). This study explores the relationship between extrinsic motivation and organizational commitment among foreign workers, mediated by cross-cultural adjustment and moderated by employer trust. Effective management of foreign personnel is essential in today's global business environment (Hua et al., 2019). The research aims to provide insights to better align organizational practices with sustainable development goals and improve workforce performance in Malaysia's palm oil industry (Thakhathi et al., 2019; Passetti et al., 2018).

Problem Statement: Recent media reports from *The Star* and the *New Straits Times* highlight severe labor shortages in Malaysia's oil palm industry, a situation worsened by the COVID-19 pandemic. This shortage, emphasized by Kadir (2022), poses a significant threat to the industry's competitiveness and sustainability. The issue is critical given that Malaysia accounts for 25% of global palm oil production and 33% of global exports (IPAD, 2023).

The sector's labor force, predominantly foreign, has declined, with 74% of the 391,000 workers in 2021 being foreign nationals, down from 80% of 437,000 workers in 2020. By August 2022, there was a shortfall of 54,630 workers, with only 382,582 employed out of the 437,212 required. Delays in permits for 32,000 approved foreign workers further strained the industry. The Malaysian Estate Owners Association (MEOA) has warned of missed revenue opportunities due to the labor shortage, estimating a need for 120,000 workers to capitalize on high palm oil prices. The MPOC adjusted its 2022 output forecast from 18.9 million to 18.6 million tonnes, with further declines possible if labor issues persist.

Research gaps exist in understanding how extrinsic motivation, cross-cultural adjustment, and employer trust impact organizational commitment among foreign workers in the palm oil industry. Cross-cultural adjustment, or how foreign workers adapt to local norms, and employer trust, the belief in employer fairness and support, are critical but underexplored factors. Additionally, there is a lack of theoretical integration of Social Exchange Theory, Expectancy Theory, and Cultural Adjustment Theories.

This study aims to investigate these relationships to address labor shortages and improve recruitment and retention, thereby contributing to the industry's long-term sustainability and competitiveness.

Objectives

RO1: To assess the impact of extrinsic motivation on organizational commitment among foreign workers in the Malaysian palm oil industry.
RO2: To investigate how cross-cultural adjustment mediates the relationship between extrinsic motivation and organizational commitment among foreign workers in the Malaysian palm oil industry.
RO3: To examine the moderating effect of employer trust on the relationship between cross-cultural adjustment and organizational commitment among foreign workers in the Malaysian palm oil industry.
RO4: To evaluate the indirect effect of employer trust on the relationship between extrinsic motivation and organizational commitment, with cross-cultural adjustment as a mediator, among foreign workers in the Malaysian palm oil industry.

2. Literature Review

This chapter provides a comprehensive review of the literature on extrinsic motivation and organizational commitment, explaining how a theoretical framework is constructed using theoretical insights such as Self-Determination Theory (SDT). It examines the impact of extrinsic rewards on intrinsic motivation and the importance of balancing these with strategies that foster long-term engagement. The chapter also explores cross-cultural adjustment, emphasizing the need for organizational support to facilitate cognitive, emotional, and behavioral adaptation among foreign workers. Additionally, it discusses the role of employer trust in enhancing employee engagement and performance and details how organizational commitment—encompassing affective, continuance, and normative dimensions—influences employee behavior and organizational effectiveness. The chapter lays the groundwork for empirical research to test these hypotheses and provides practical implications for improving job satisfaction and commitment among foreign workers.

Extrinsic Motivation and Organizational Commitment: Extrinsic motivation, through financial incentives, career advancement opportunities, and recognition programs, is crucial for enhancing job satisfaction, retention, and commitment among foreign workers, particularly in industrialized nations where they seek to improve their wealth and income (Chua & Ayoko, 2021). Effective use of these motivators aligns with organizational goals, fostering a motivated workforce and enhancing overall productivity and engagement (Earley & Ang, 2021). Creating a supportive environment that acknowledges diverse backgrounds further strengthens this commitment, which helps organizations attract and retain top global talent, thereby maintaining a competitive edge in the global market (Chen, 2019). Thus, leveraging extrinsic rewards can significantly inspire foreign employees to dedicate themselves to both their company and career (Shin & Jung, 2021).
H1: There is a relationship between extrinsic motivation and organizational commitment.

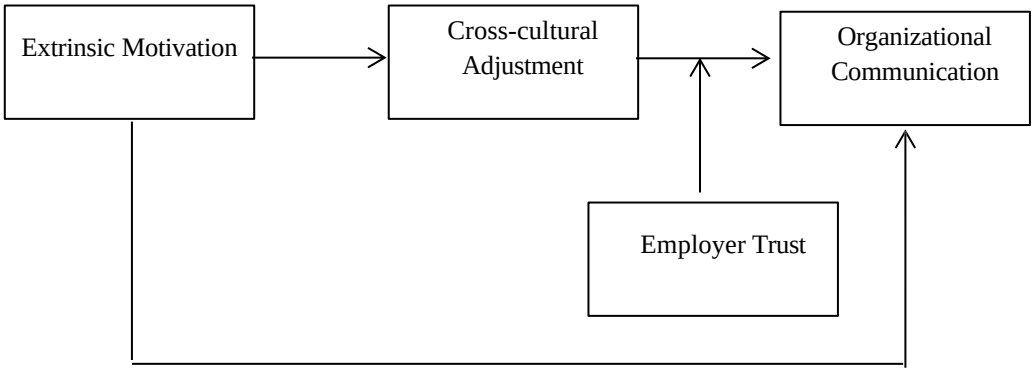
Mediating Role of Cross-Cultural Adjustment: Integrating insights from SDT and organizational commitment literature, cross-cultural adjustment plays a crucial mediating role in the relationship between extrinsic motivation and organizational commitment. SDT suggests that external incentives, such as financial rewards and career opportunities, significantly influence foreign workers' behaviors and attitudes in new cultural contexts (Escobar Fandiño et al., 2019). When aligned with personal goals, these incentives encourage greater job effort and commitment (Shin & Jung, 2021; Stupnisky et al., 2018). Social Exchange Theory and SDT further highlight that successful cultural adaptation fosters a sense of belonging and emotional attachment to organizations, thereby strengthening relationships and commitment to organizational goals (Hua et al., 2019). Practical strategies to support this adjustment include cultural orientation programs, tailored incentive structures, and supportive management practices (Caligiuri & Tarique, 2019). These approaches facilitate smoother integration, reduce cultural barriers, and enhance job satisfaction, thereby improving organizational commitment (Earley & Ang, 2021). Therefore, understanding and leveraging cross-cultural adjustment can significantly enhance the performance and dedication of foreign workers, leading to greater organizational success.
H2: There is a relationship between extrinsic motivation and organizational commitment mediated by cross-cultural adjustment.

Moderating Role of Employer Trust: Trust, defined as "a psychological condition characterized by a readiness to embrace vulnerability to another based on favorable expectations about that other's intentions or behavior" (Heyns & Rothmann, 2021), can be categorized into supervisor trust and leader trust (Kim et al., 2018). Supervisor trust involves employees' confidence in their immediate supervisors who oversee daily operations, while leader trust pertains to confidence in higher-level executives responsible for strategic decisions (Hambrick & Wowak, 2021). Trust is pivotal in the employee-manager relationship (Kloutsiniotis & Mihail, 2018), with mutual trust promoting positive behaviors (Ye et al., 2021). For foreign workers, trust in supervisors provides essential support and guidance in navigating a new environment, enhancing job security and income stability (Chen et al., 2018). High levels of supervisor trust lead to greater employee confidence and motivation, fostering active engagement and adaptation (Nedkovski et al., 2017). Conversely, low supervisor trust can cause insecurity and isolation, hindering cultural adjustment and organizational commitment (Osborne & Hammoud, 2017). Therefore, it is hypothesized that:
H3: The relationship between cross-cultural adjustment and organizational commitment is moderated by employer trust.

In developing hypotheses about the moderating roles of employer trust and cross-cultural adjustment, theories such as Social Exchange Theory, Expectancy Theory, and Cultural Adjustment Theories offer valuable insights. Social Exchange Theory suggests that employer trust fosters a reciprocal relationship where employees feel valued and reciprocate with higher commitment and effort, particularly when extrinsic rewards are present (Cropanzano & Mitchell, 2005). Expectancy Theory posits that effective cross-cultural adjustment aligns workers' expectations with achievable rewards, thus enhancing organizational commitment (Linderbaum & Jordan, 2018). Cultural Adjustment Theories, like Ward's Model, emphasize that mastering cultural norms and achieving psychological comfort enable foreign workers to effectively leverage extrinsic motivators, leading to sustained commitment (Ward & Geeraert, 2016). Integrating these perspectives, the hypothesis proposed is that fostering high employer trust and facilitating effective cross-cultural adjustment can optimize the motivational impact of extrinsic rewards on organizational commitment among foreign workers. Therefore, the following hypothesis is proposed:
H4: The relationship between extrinsic motivation and organizational commitment is moderated by the indirect effect of employer trust via cross-cultural adjustment.

Theoretical Framework:

Figure 1: Theoretical Framework (Pham et al., 2023)



3. Research Methodology

This chapter outlines the research methodology employed in this study, encompassing research design, population, sampling, instrument design, pre-testing, data collection, analysis, and ethical considerations. A survey research approach was utilized, with data gathered via a questionnaire from foreign workers in Malaysia's oil palm plantation industry, specifically targeting 10 prominent companies listed on the MPOC website. The sample size, determined using the Raosoft Calculator, exceeded the minimum requirement, ensuring reliability and validity. Instrument reliability and validity were assessed through expert reviews and pre-testing, which revealed moderate to poor reliability for some constructs, necessitating refinement. Data collection was conducted online, enhancing respondent privacy and data quality. Analysis was performed using IBM SPSS software, including data screening, descriptive statistics, correlation, and regression analysis. Ethical approval ensured adherence to standards regarding participant welfare, confidentiality, and data handling.

4. Results

This chapter, which analyses data collected from students via survey, will provide a comprehensive overview of the findings derived from various analytical techniques. It will begin with a detailed discussion of the descriptive analysis results, including summaries such as means, standard deviations, and distributions of the survey responses, thereby presenting the basic characteristics of the data. Following this, the chapter will delve into the findings from correlation analysis, exploring how different variables —such as cross-cultural adjustment, employer trust, and organizational commitment— relate to each other as well as to the outcome variable, extrinsic motivation. Significant correlations will be highlighted, as indicated by Pearson correlation coefficients and their significance levels. The regression analysis findings will then be addressed, interpreting regression coefficients to assess the impact of cross-cultural adjustment, employer trust, and organizational commitment on predicting extrinsic motivation scores. This section will discuss the model's goodness-of-fit (R-squared), and the significance of predictors (p-values), and provide insights into how well the model explains variations in extrinsic motivation. Finally, the chapter will address the hypotheses formulated at the outset of the study, presenting conclusions drawn from the data analysis. It will offer insights into whether the hypothesized relationships between variables were supported by the survey data, tying together the analytical findings into a coherent narrative that informs the reader about the implications and significance of the survey results for understanding the student population and their characteristics.

Response Rate: In survey research, the response rate is the percentage of completed surveys returned out of the total distributed, serving as a key indicator of data quality and representativeness. A high response rate generally signifies more reliable and reflective results of the target population. In this study, the response rate was exceptional, with 100% of the 242 distributed questionnaires being returned and none deemed unusable. This full participation ensures that the data is highly representative of the target population, enhancing the credibility and reliability of the findings. Such a high response rate reduces non-response bias, providing a robust foundation for analyzing and drawing conclusions about extrinsic motivation, cross-cultural adjustment, organizational commitment, and employer trust in the oil palm plantation industry in Malaysia.

Frequency: Frequency in research refers to counting the occurrences of specific values or categories within a dataset, providing crucial descriptive statistics. In this study, frequency analysis summarizes the demographic profiles of respondents, as shown in Table 4.1. All 242 respondents were male, highlighting a gender-specific focus or predominantly male workforce. Marital status data revealed that 27.7% were married and 72.3% were single, suggesting a younger workforce or distinct socio-economic characteristics. The age distribution showed no respondents were under 20 years old; 74.8% were between 21 and 30 years old, and 25.2% were 31 years or older, indicating a predominantly young workforce with some experienced individuals. Racial diversity included 24.4% Bangladeshis, 28.9% Indonesians, 24.0% Nepalis, and 22.7% Myanmarese, reflecting the multinational nature of the workforce. Working experience varied, with 44.6% having 1 to 3 years, 31.0% having 2 to 5 years, and 24.4% having more than 5 years, suggesting a mix of new and experienced workers. This comprehensive demographic overview is essential for understanding workforce composition and tailoring strategies to enhance organizational commitment, cross-cultural adjustment, and employee satisfaction in Malaysia's palm oil industry.

Table 1: Frequency

VARIABLE	FREQUENCY	PERCENTAGE
GENDER		
Males	242	100.00%
Females	0	0.00%
Total	**242**	**100.00**%
MARITAL STATUS		
Married	67	27.70%
Single	175	72.30%
Total	**242**	**100.00**%
AGE		
Under 20	0	0.00%
21-30	181	74.80%
31 and above	61	25.20%
Total	**242**	**100.00**%
RACE		
Bangladesh	59	24.40%
Indonesia	70	28.90%
Nepal	58	24.00%
Myanmar	55	22.70%
Total	**242**	**100.00**%
WORKING EXPERIENCE		
Less than 1 year	0	0.00%
1 year – 3 years	108	44.60%
2 year – 5 years	75	31.00%
more than 5 years	59	24.40%
Total	**242**	**100.00**%

Descriptive Statistics: Descriptive analysis in this study offers a foundational overview of key variables—extrinsic motivation, cross-cultural adjustment, employer trust, and organizational commitment—within Malaysia's palm oil industry. The analysis utilizes descriptive statistics, including mean, median, mode, and standard deviation, to provide insights into the average levels and variability of these variables among respondents. For extrinsic motivation, the mean is 3.04 with a standard deviation of 0.58, indicating moderate and consistent motivator levels. Cross-cultural adjustment has a mean of 3.10 and a standard deviation of 0.62, reflecting moderate adaptation with some variability. Employer trust scores an average of 3.03 with a standard deviation of 0.74, highlighting moderate trust but greater variability in perceptions. Organizational commitment averages 3.06 with a standard deviation of 0.61, showing moderate commitment with some differences among employees. Overall, these descriptive statistics offer a clear summary of respondent attitudes, setting the stage for deeper statistical analyses and interpretation of relationships between these variables.

Normality: Normality analysis assesses whether the data distributions of variables such as extrinsic motivation, cross-cultural adjustment, employer trust, and organizational commitment in the Malaysian palm oil industry approximate a normal distribution. This is crucial for the validity of many statistical techniques. Graphical tools like histograms and Q-Q plots, alongside skewness and kurtosis statistics, assist in this assessment. According to Table 4.2, extrinsic motivation shows a positively skewed distribution (skewness = 1.34) with high kurtosis (4.25), indicating a concentration of responses around higher values and heavy tails. Cross-cultural adjustment also displays positive skewness (0.84) and moderate kurtosis (2.47), suggesting a right-skewed distribution with a somewhat peaked shape. Employer trust displays slight positive skewness (0.50) and near-normal kurtosis (0.81), indicating a distribution that approximates normality. Organizational commitment exhibits positive skewness (1.15) and moderate kurtosis (2.89), revealing a moderately right-skewed distribution with a more pronounced peak. These results guide the choice between parametric and non-parametric statistical methods, ensuring accurate and reliable analyses.

Table 2: Normality Analysis

Variable	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Std. Error
Dependent Variable **Extrinsic Motivation**	1.34	0.16	4.25	0.31
Mediator variable **Cross-cultural Adjustment**	0.84	0.16	2.47	0.31
Moderator Variable **Employer Trust**	0.50	0.16	81	0.31
Independent Variable **Organizational Commitment**	1.15	0.16	2.89	0.31

Reliability: Understanding Cronbach's alpha is crucial for assessing the reliability of the scales used in this study. Cronbach's alpha values range from 0 to 1, with higher values indicating better internal consistency. According to Table 4.6.1, Extrinsic Motivation and Organizational Commitment show moderate reliability, with alphas of 0.68 and 0.66, respectively. This suggests some internal consistency but also room for improvement. Cross-cultural Adjustment and Employer Trust exhibit poor reliability, with alphas of 0.40 and 0.44, indicating significant issues with the consistency of these scales. Addressing these reliability issues by refining measurement items and conducting pilot tests is essential for enhancing the robustness of the analysis and ensuring accurate insights into the variables within the Malaysian palm oil industry context.

Table 3: Reliability Analysis

Variables	Cronbach's Alpha	Strength
Dependent Variable **Extrinsic Motivation**	0.68	Moderate
Mediator variable **Cross-cultural Adjustment**	0.40	Poor
Moderator Variable **Employer Trust**	0.44	Poor
Independent Variable **Organizational Commitment**	0.66	Moderate

Correlation: The correlation analysis in this study reveals significant relationships between extrinsic motivation, cross-cultural adjustment, employer trust, and organizational commitment among employees in the Malaysian palm oil industry. Specifically, extrinsic motivation is strongly positively correlated with both cross-cultural adjustment (0.619) and organizational commitment (0.546). This indicates that employees who are motivated by external rewards tend to adapt better to cultural differences and exhibit higher levels of commitment to their organization. Additionally, extrinsic motivation is positively related to employer trust (0.528), suggesting that employees with higher extrinsic motivation are more likely to trust their employers. Cross-cultural adjustment also shows positive correlations with both employer trust (0.512) and organizational commitment (0.461), highlighting that employees who adapt well to cultural differences are generally more trusting of their employers and more committed to their organization. Lastly, there is a positive

correlation between employer trust and organizational commitment (0.399), indicating that higher levels of trust in the employer are associated with greater organizational commitment. These findings underscore the interconnectedness of these variables and suggest that improvements in one area can positively influence the others, thereby enhancing overall employee engagement and organizational effectiveness.

Table 4: Pearson Correlation

Variable		Extrinsic Motivation	Cross-cultural Adjustment	Employer Trust	Organizational Commitment
Extrinsic Motivation	Pearson Correlation	1			
Cross Cultural Adjustment	Pearson Correlation	0.619**	1		
Employer Trust	Pearson Correlation	0.528**	0.512**	1	
Organizational Commitment	Pearson Correlation	0.546**	0.461**	0.399**	1

**. Correlation is significant at the 0.01 level (2-tailed).

Regression: Regression Analysis Between Extrinsic Motivation and Organizational Commitment

Table 5: Result of Coefficients Analysis

Model		Unstandardised Coefficients		Standardized Coefficients	t	Sig.
		β	Std. Error	Beta		
1	(Constant)	1.30	0.18		7.39	<.001
	Organizational Commitment	0.58	0.05	0.55	10.10	<.001

Table 5 presents the results of the coefficients analysis, which elucidates the relationship between Organizational Commitment and the dependent variable, Extrinsic Motivation. The unstandardized coefficients reveal that the constant term is 1.30, with a standard error of 0.18. This constant represents the predicted value of Extrinsic Motivation when Organizational Commitment is zero. The associated t-value is 7.39, and the significance level is less than .001, indicating that the constant term is statistically significant and provides a robust baseline for the model. The coefficient for Organizational Commitment is 0.58, with a standard error of 0.05. This unstandardized coefficient suggests that for each unit increase in Organizational Commitment, Extrinsic Motivation is expected to increase by 0.58 units. The standardized coefficient (Beta) is 0.55, reflecting the strength and direction of the relationship in standardized terms. The t-value for this coefficient is 10.10, with a p-value less than .001, signifying that Organizational Commitment is a significant predictor of Extrinsic Motivation.

In summary, the analysis of the coefficients substantiates the significant positive impact of Organizational Commitment on Extrinsic Motivation. The high t-values and low p-values for both the constant term and the predictor coefficient underscore the statistical significance of the findings, highlighting the substantial role of Organizational Commitment in influencing Extrinsic Motivation.

Regression Analysis Between Extrinsic Motivation, Organizational Commitment, and Cross-cultural Adjustment:

Table 6: Result of Coefficients Analysis

Model		Unstandardised Coefficients		Standardized Coefficients	t	Sig.
		β	Std. Error	Beta		
1	(Constant)	1.09	0.19		5.80	<.001
	Organizational Commitment	0.45	0.07	0.42	6.24	<.001
	Cross-cultural Adjustment	0.20	0.07	0.20	2.94	<.001

Table 6 presents the coefficients analysis results for the regression model examining Organizational Commitment, with Cross-cultural Adjustment and Extrinsic Motivation as predictors. The constant term has an unstandardized coefficient of 1.09 and a standard error of 0.19, representing a baseline level of Organizational Commitment when the predictors are zero. This coefficient is statistically significant, with a t-value of 5.80 and a p-value of less than .001. Extrinsic Motivation has an unstandardized coefficient of 0.45, a standard error of 0.07, and a standardized coefficient (Beta) of 0.42. The t-value is 6.24, with a significance level below .001, indicating a strong and statistically significant positive impact on Organizational Commitment. Cross-cultural Adjustment has an unstandardized coefficient of 0.20, a standard error of 0.07, and a standardized coefficient (Beta) of 0.20. The t-value is 2.94, and the significance level is less than .001, demonstrating a statistically significant positive effect on Organizational Commitment. These findings highlight the significant roles of both Extrinsic Motivation and Cross-cultural Adjustment in influencing Organizational Commitment within the model.

Regression Analysis Between Extrinsic Motivation, Organizational Commitment, and Cross-cultural Adjustment:

Table 7: Result of Coefficients Analysis

Model		Unstandardised Coefficients		Standardized Coefficients	t	Sign.
		β	Std. Error	Beta		
1	(Constant)	4.58	0.52		8.78	<.001
	Cross-cultural Adjustment	-0.90	0.02	-0.64	-3.84	<.001
	Employer trust	-0.15	0.03	-0.88	-4.81	<.001
	Cross-cultural Adjustment_Employer Trust	0.27	0.00	1.85	6.37	<.001

Table 7 presents the results of the regression analysis examining the effects of cross-cultural adjustment, employer trust, and their interaction on organizational commitment. The constant term, with an unstandardized coefficient of 4.58, is statistically significant ($p < .001$), indicating that when both cross-cultural adjustment and employer trust are zero, the expected level of organizational commitment is 4.58.

The analysis reveals that cross-cultural adjustment has a significant negative impact on organizational commitment, with an unstandardized coefficient of -0.90 and a standardized coefficient (Beta) of -0.64. This suggests that a one-unit increase in cross-cultural adjustment is associated with a decrease of 0.90 units in organizational commitment. The negative relationship is further supported by a t-value of -3.84 and a p-value of less than .001, signifying statistical significance.

Similarly, employer trust exhibits a negative effect on organizational commitment, with an unstandardized coefficient of -0.15 and a standardized coefficient (Beta) of -0.88. This indicates that each one-unit increase in employer trust results in a 0.15-unit reduction in organizational commitment. The significant t-value of -4.81 and a p-value of less than .001 confirm the robustness of this negative relationship.

Furthermore, the interaction term between cross-cultural adjustment and employer trust demonstrates a significant positive effect on organizational commitment. The unstandardized coefficient of 0.27, combined with a standardized coefficient (Beta) of 1.85 and a t-value of 6.37, with a p-value less than .001, suggests that employer trust moderates the relationship between cross-cultural adjustment and organizational commitment. This interaction highlights the complexity of the dynamics influencing organizational commitment, indicating that the presence of employer trust amplifies the effect of cross-cultural adjustment on organizational commitment.

In summary, the findings indicate that while both cross-cultural adjustment and employer trust have negative direct effects on organizational commitment, their interaction positively influences organizational commitment which reflects the nuanced interplay between these factors.

Regression Analysis Between Extrinsic Motivation, Organizational Commitment, Cross-cultural Adjustment, and Employer Trust:

Table 8: Result of Coefficients Analysis

Model		Unstandardised Coefficients		Standardized Coefficients	t	Sign.
		β	Std. Error	Beta		
1	(Constant)	1.08	0.17		6.44	<.001
	Extrinsic Motivation	0.66	0.05	0.62	12.22	<.001
2	(Constant)	1.09	0.19		5.80	<.001
	Extrinsic Motivation	0.45	0.07	0.42	6.24	<.001
	Cross-cultural Adjustment	0.20	0.07	0.20	2.94	.004
3	(Constant)	0.00	0.00			
	Cross-cultural Adjustment	1.00	0.00	1.00		
	Employer Trust	0.00	0.00	0.00		
	Cross-cultural Adjustment_Employer Trust	0.00	0.00	0.00		

Table 8 presents the results of the coefficients analysis examining the interrelationships among Extrinsic Motivation (EM), Cross-Cultural Adjustment (CcA), Organizational Commitment (OC), and the moderating effect of Employer Trust (ET).

The first model assesses the influence of extrinsic motivation on cross-cultural adjustment. The results demonstrate a robust and statistically significant positive relationship, with an unstandardized coefficient (β) of 0.66, a standardized coefficient (Beta) of 0.62, a t-value of 12.22, and a p-value of less than 001. This indicates that higher levels of extrinsic motivation are associated with improved cross-cultural adjustment, underscoring the pivotal role of motivational factors in facilitating adaptation to new cultural environments.

The second model evaluates the effects of both extrinsic motivation and cross-cultural adjustment on organizational commitment. The findings indicate that extrinsic motivation positively affects organizational commitment, with an unstandardized coefficient (β) of 0.45, a standardized coefficient (Beta) of 0.42, a t-value of 6.24, and a p-value of less than .001. Additionally, cross-cultural adjustment significantly influences organizational commitment, as evidenced by an unstandardized coefficient (β) of 0.20, a standardized coefficient (Beta) of 0.20, a t-value of 2.94, and a p-value of.004. These results suggest that both increased extrinsic motivation and enhanced cross-cultural adjustment contribute to higher organizational commitment, emphasizing the importance of these variables in fostering employees' dedication to their organization.

The third model examines the roles of cross-cultural adjustment, employer trust, and their interaction on cross-cultural adjustment. However, the analysis reveals non-significant results for all components, including coefficients of zero for cross-cultural adjustment, employer trust, and their interaction term. This suggests that these variables do not significantly impact cross-cultural adjustment within this model, indicating that the interaction between these factors may not substantially influence individuals' adjustment to new cultural settings.

In summary, the analysis shows that extrinsic motivation positively influences both cross-cultural adjustment and organizational commitment. Specifically, for every increase in extrinsic motivation, cross-cultural adjustment improves by 0.66 units, and organizational commitment increases by 0.45 units. Cross-cultural adjustment also positively impacts organizational commitment, with an increase of 0.20 units per unit increase in cross-cultural adjustment. The indirect effect of extrinsic motivation on organizational commitment through cross-cultural adjustment, calculated as $0.66 \times 0.20 = 0.13$, highlights that part of the relationship between extrinsic motivation and organizational commitment is mediated by cross-cultural adjustment. However, employer trust does not significantly moderate the relationship between extrinsic motivation and cross-cultural adjustment in this dataset.

Summary of Hypothesis:

Table 9: Summary of Hypothesis

No	Hypotheses	Result
H1	There is a relationship between extrinsic motivation and organizational commitment.	Positive
H2	There is a relationship between extrinsic motivation and organizational commitment that is mediated by cross-cultural adjustment.	Positive
H3	There is a relationship between cross-cultural adjustment and organizational commitment that is moderated by employer trust.	Positive
H4	There is a relationship between extrinsic motivation and organizational commitment that is moderated by the indirect effect of employer trust via cross-cultural adjustment.	Negative

5. Managerial Implications and Recommendations

Future research should explore several avenues to extend and deepen the insights gained from this study. Firstly, examining the long-term effects of extrinsic motivation strategies through longitudinal studies could yield valuable insights into the sustained impact of these strategies on organizational commitment over time. Secondly, a comprehensive exploration of intrinsic motivation alongside extrinsic factors would provide a more nuanced understanding of the drivers behind foreign workers' commitment. Factors such as personal growth, job satisfaction, and a sense of purpose may interact with extrinsic motivators in complex ways. Thirdly, a detailed investigation into the cultural dimensions of cross-cultural adjustment is warranted. Future studies could explore how varying cultural backgrounds influence the adjustment process and whether specific cultural traits facilitate or impede integration. Comparative studies involving foreign workers from diverse countries could provide further insights into these dynamics.

Furthermore, analyzing the influence of organizational culture on foreign workers' commitment and adjustment would be highly beneficial. Understanding how organizational values, leadership styles, and corporate practices impact foreign workers can assist in the design of more effective integration and retention strategies. Additionally, research into the role of social support networks, both within and outside the workplace, on workers' well-being and commitment would provide further valuable insights. Finally, given the rapid pace of technological advancements, future research should explore the potential of digital tools and platforms in supporting cross-cultural adjustment and enhancing motivation. Innovative approaches, such as virtual reality training programs, online support communities, and mobile applications for language learning and cultural orientation, represent promising areas for exploration. Addressing these research directions will contribute to a more nuanced and practical understanding of how to effectively manage and support foreign workers within the palm oil industry and beyond.

Conclusion

This study has shed light on the complex relationships between extrinsic motivation, cross-cultural adjustment, and organizational commitment among foreign workers in Malaysia's palm oil industry. The findings reveal several critical insights. Firstly, extrinsic motivation exerts a significant impact on organizational commitment among foreign workers. Key factors such as financial incentives, job security, and favorable working conditions are pivotal in enhancing workers' dedication and loyalty.

Secondly, cross-cultural adjustment serves as a crucial mediator in the relationship between extrinsic motivation and organizational commitment. Workers who effectively navigate and adapt to the local culture and work environment exhibit higher levels of commitment. This adaptation is facilitated by robust support systems, comprehensive training programs, and inclusive workplace practices. Thirdly, employer trust emerges as a significant moderating factor. High levels of trust between employers and foreign workers amplify the positive effects of extrinsic motivation on organizational commitment, leading to a more motivated and committed workforce, improved job performance, and a positive organizational climate.

Foreign workers encounter various challenges in adjusting to the local culture, including language barriers, differing work practices, and social integration issues. Effective support systems and training programs are

essential for addressing these challenges, facilitating smoother cultural integration, and enhancing job satisfaction. By understanding these factors, employers can develop targeted strategies to improve job satisfaction and retention rates. Addressing the unique needs and challenges faced by foreign workers can result in a more committed, motivated, and productive workforce.

The implications of these findings underscore the necessity of addressing extrinsic motivation, cross-cultural adjustment, and employer trust to enhance organizational commitment. Employers should prioritize competitive remuneration, job security, and improved working conditions, while also implementing effective support systems and fostering an inclusive work environment. Building employer trust through transparent communication and fair treatment is also crucial. These measures are expected to significantly enhance workforce stability, productivity, and overall industry sustainability.

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The Psychological Contract Theory on Student Retention: A Systematic Literature Review

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Abstract: The purpose of this article is to cover the themes central to psychological contract theory as well as its impact on student retention. While psychological contract theory has been extensively studied and applied in work-related settings, its influence in educational settings has not been fully explored. To address this gap, this study collected and analyzed data following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Data was collected from studies published between 2013 and 2023, resulting in the analysis of 24 eligible papers from various academic databases in the review. Based on the number of eligible papers within a ten-year timeframe indicates a scarcity of research on psychological contracts in educational contexts, particularly concerning student retention. The findings from the 24 eligible papers were synthesized and reported using descriptive analysis and tabulation, thus shedding light on how psychological contract theory influences student retention. The analysis suggests that unfulfilled psychological contracts between students and academic staff can contribute to student attrition, especially when students' expectations, formed during earlier educational experiences, are not met. This systematic literature review emphasizes the importance of the psychological contract in educational settings particularly in managing the dynamic student and academic relationship. The review made suggestions for practical implications for academic leaders, policymakers, and education administrators, stressing the need for adaptive, inclusive, and forward-looking approaches in education, and recommendations for future studies.

Keywords: *Psychological contract, student retention, education, systematic literature review, PRISMA*

1. Introduction and Background

In the evolving landscape of higher education, understanding and addressing the complex expectations that students bring to university settings is crucial for fostering a successful academic experience. Students arrive at universities with diverse expectations shaped by personal aspirations, cultural backgrounds, socioeconomic influences, and prior educational experiences (Tinto, 1993). These expectations, when unmet, can significantly influence student retention. Faculty members, especially academic staff, play a vital role in meeting these expectations, which is essential for maintaining student interest and promoting retention.

The theory of psychological contract, introduced by Argyris (1960) and later expanded by Rousseau, primarily addresses the implicit expectations in employer-employee relationships. This theory has gained significant traction in the field of organizational studies particularly to understand employee behavior and retention. However, it has significant implications for educational environments as well. Recently, researchers have applied psychological contract theory to examine students' expectations of higher education institutions, focusing on the psychological contracts formed between students and their academic staff (Itzkovich, 2021).

In an organizational context, a psychological contract refers to an individual's beliefs about mutual obligations in an exchange relationship, such as employment. These beliefs are rooted in perceived promises that both parties must honor (Rousseau, 2000), with shared responsibilities benefiting the organization (Gorde, 2019). This unwritten agreement is crucial for determining employee engagement and is based on how employees interpret their relationship with their employer (Zacchaeus, 2021). Similarly, in educational settings, psychological contracts are formed between students and academic staff, shaping students' academic experiences and influencing their decisions to remain at an institution.

The fulfillment of psychological contracts in educational contexts is vital for student retention. Retaining students benefits institutions financially and academically while also contributing to broader national economic growth, as education is closely linked to individual and societal development. Despite extensive research on student retention, few studies have approached the topic from a psychological perspective. This

study aims to fill that gap by reviewing the impact of psychological contracts on student retention, focusing on research published over the past decade.

2. Literature Review on psychological contract in an organizational setting

Rousseau (1989), a key figure in psychological contract theory, defines a psychological contract as the expectations and beliefs individuals hold about their mutual agreement in a relationship. This concept has been widely studied across various industries, including banking (Gulzar et al., 2021; Ngobeni et al., 2022), hospitality (Arasli et al., 2019), public and private sectors (Yu, 2022; Zacchaeus, 2021), mining (Li & Chen, 2018), social services (Battisti et al., 2007; Welander et al., 2020), automotive (Liu et al., 2020), aviation (Löffert & Diehl, 2023), and both small and large-scale industries (Ntalianis & Dyer, 2021; Choi et al., 2019). Across these diverse industries, this highlights that psychological contracts play a critical role in understanding the dynamics of employee retention.

In an organizational setting, the psychological contract is mostly built around the expectation that employers should provide job security, fair compensation, and opportunities to grow with the organization, which focuses on favorable working conditions for employees. Employers too pose expectations that employees must be loyal, committed, and productive. When both parties fulfill these expectations, a positive working relationship is possible, leading to better employee attitudes and behaviors (Gorde, 2019). This reciprocal relationship is in line with the social exchange theory, which suggests that when expectation, promises or the contract is honored employees are motivated to maintain the relationship and stay in the employment.

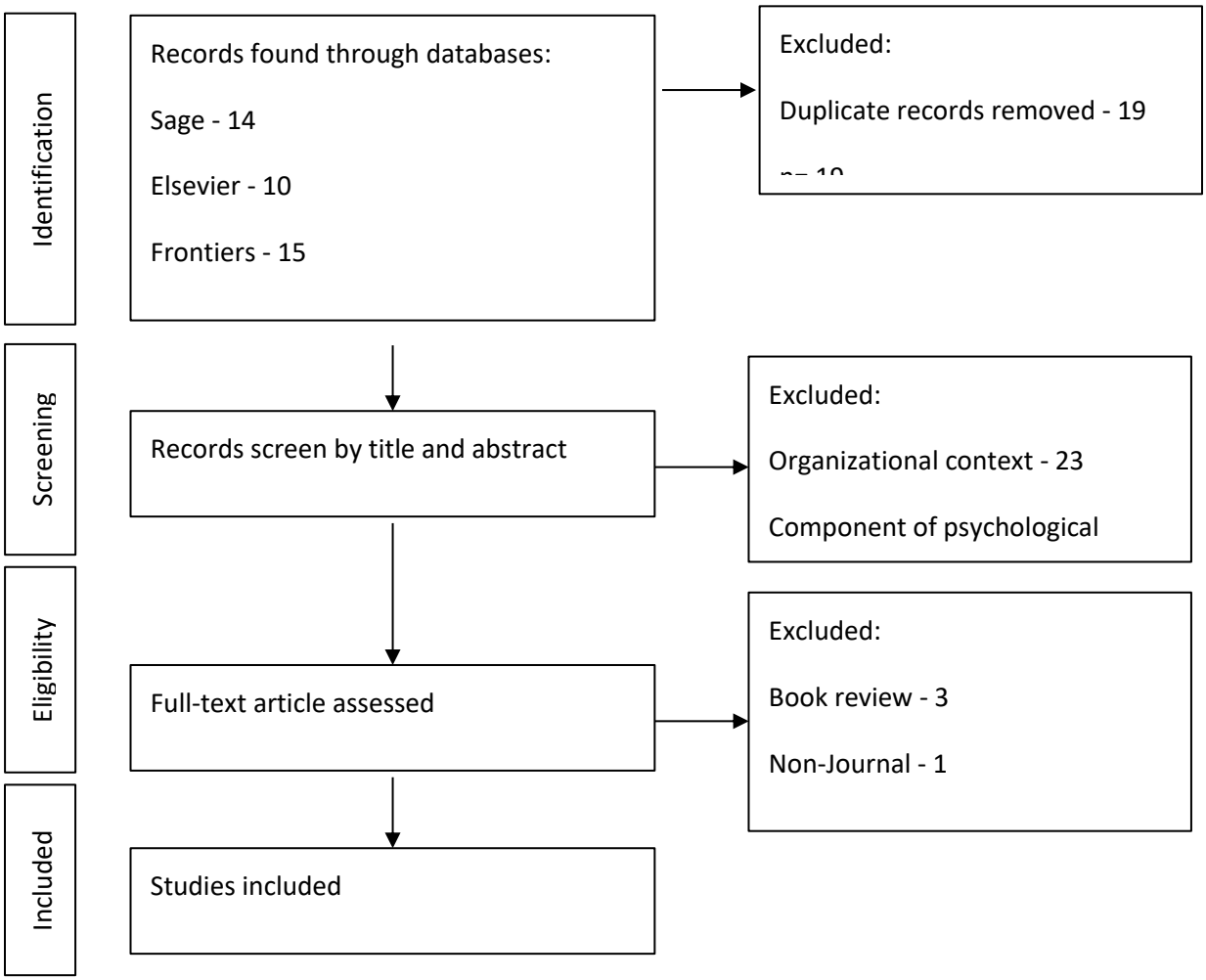
Since psychological contracts are extremely personal and vary between individuals, making them vulnerable to both breaches and positive reinforcement. Whether the contract is honored or not, it can significantly influence the relationship between the employee and the employer, affecting important outcomes such as job satisfaction, organizational commitment, and turnover intentions. This dynamic has been explored across numerous sectors, including the military (Kiili, 2016; Kraak et al., 2022; Lu, 2020; Pohl et al., 2016; Soares & Mosquera, 2019) and healthcare (Collins & Beauregard, 2020; Grama, 2020), where the psychological contract plays a crucial role in employee retention.

While psychological contracts have been extensively studied in organizational settings, there is limited study in higher education. For universities that value students highly, understanding and meeting students' expectations are essential for fostering long-term engagement and retention. However, the literature on psychological contracts in educational settings, particularly in relation to student retention, remains scarce (Koskina, 2013; Beenen & Arbaugh, 2019). This study seeks to fill this gap by exploring how psychological contracts between students and academic staff can influence retention rates in higher education institutions.

3. Methodology

This systematic review process was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework, as depicted in Figure 1. PRISMA provides a standardized framework that ensures a thorough and transparent review process and places importance on the quality and reproducibility of systematic reviews. The process incorporates four main steps; identification, screening, eligibility and finally inclusion.

Figure 1: Reporting items for the systematic review (adapted from the Preferred Reporting Items for Systematic Reviews (PRISMA) statement).



A review protocol was established, detailing the search strategy, data extraction process, data analysis methods, and article selection criteria which are discussed next.

Data Sources and Search Strategies

After defining the research objective, the author conducted systematic searches using electronic databases including SAGE, Elsevier, Frontiers, Taylor & Francis, and Google Scholar. The search focused on articles published between 2013 and 2023, with keywords such as "psychological contract" AND "student retention" OR "retention". Multiple databases were used to capture a wide range of perspectives on the topic.

Table 1: Keywords applied during the systematic literature review process

Databases	Keyword
SAGE Frontiers Taylor & Francis Google Scholar	"psychological contract" AND "student retention" OR "retention"

Selection of Studies: Inclusion and Exclusion Criteria

The selection process involved three rounds. The first round involved screening titles and abstracts, followed by a detailed analysis of the articles' relevance to the research topic. In the final round, full-text articles were thoroughly reviewed, and those not addressing psychological contract-related student retention were excluded.

Titles and abstracts were initially screened to assess their relevance. Table 2 guided the selection of the study to be included in this systematic literature review. Only articles that were written in English, in peer-reviewed journals, available in full-text, written between 2013 to 2023 were included. Plus, a paper that has students as participants in the study was included in this review.

Unpublished theses and dissertations, book reviews, conference papers for the period under review in this study were not included in the articles for the analyses in the PRISMA. Also, articles that were published before 2013 were not included in the analyses and articles published after December 2023. Papers with participants that did not involve students were excluded from this study. Other reasons for exclusion are mentioned in the adapted PRISMA flow diagram in Figure 1.

Table 2: Inclusion and Exclusion Criteria

Criteria	Inclusion	Exclusion
Year	From 2013 to 2023	Anything published before 2013
Access	Open access	Close access
Document Type	Full-text article	Book review, conference paper, unpublished thesis and dissertation
Source type	Peer-reviewed journal	Book, conference paper
Language Subject	English language	Other than English language
Participant	Student	Employees

Data Extraction Process and Quality Assessment

Data from the selected studies were systematically recorded in an evidence table (see Table 3, in Section 3.0). The extraction process focused on capturing key information relevant to the research questions.

4. Results

The systematic review yielded a total of 24 relevant articles from the initial pool of 220. In the first round of screening, a total of 19 duplicates were removed which makes 201 sources remain for screening of title and abstract based on the inclusion and exclusion criteria (Table 2). A total of 165 were excluded for all the reasons in Table 2, and upon a complete reading of each article, another 13 were removed, of which only 24 were included in this systematic literature review.

Table 3 describes all 24 articles included in this review. The articles were tabulated according to author, year, and title, the objectives of the study, sample, method, and analysis as well as the primary findings of the studies. These articles were then tabulated according to several dimensions, including publication trends, journal distribution, author contributions, and the tools and techniques employed in the studies.

Table 3: Psychological contract and student retention articles included in the SLR

Author, Year & Title	Objective	Sample & Method	Analysis	Findings
Author: Barnhill, Czekanski & Turner (2013) **Title**: Psychological Contracts and Student-Athlete	To examine the impact that perceived breaches of psychological contracts have on student-athletes effective outcomes	**Sample**: 258 student-athletes **Method**: Questionnaire	CFA	Athletic departments should stress to their coaches the importance of clear communication lines with their student-athletes
Author: Koskina (2013) **Title**: What does the student psychological contract mean?: Evidence from a UK business school	Explores the concepts and relationships that students attach to the psychological contract	**Sample**: Postgraduate students **Method**: Interview	-	Students' perceptions were supplemented with academics' perceptions, to give a more rounded picture of the student psychological contract
Author: Barnhill & Turner (2015) **Title**: The Impact of Psychological Contract Breach on Student-athlete Perceived in-role-performance and Organizational Citizenship Behavior	To explore how psychological contracts affect student-athletes behaviors and performance	**Sample**: 248 student-athletes **Method**: Questionnaire	IBM SPSS	Psychological contract breaches might affect student-athletes differently than other types of organizational members
Author: Pleitz, MacDougall, Terry, Buckley & Campbell (2015) **Title**: Great expectations examining the discrepancy between expectations and experiences on college student retention	Evaluating the degree to which the discrepancy between student expectations and experiences can result in greater rates of attrition in education	**Sample**: 225 students **Method**: Questionnaire	Logistic Regression Results	Students are entering higher education with an inaccurate idea of what college life will be like. Students have preconceived notions and corresponding expectations concerning social life, institutional characteristics, and academic rigor. Students who reported a greater discrepancy in their expectations and experiences within the social areas of the institution were also more likely to leave
Author: Glazier (2016) **Title**: Building rapport to improve retention and success in online classes	To hypothesize that the difficulty of establishing student-instructor rapport in online classes contributes to lower student success	**Sample**: 465 online students **Method**: Interview	Means tests, logit models, and OLS regression	The students in the rapport condition feel like the instructor is engaged and accessible, and this perception translates into measurably better outcomes for students
Author: Klapproth, Schaltz, Brunner, Fischbach, Ugen & Martin (2016) **Title**: Short-term and medium-term effects of grade retention in Secondary School on academic Achievement and Psychosocial Outcome Variables	To examine how grade retention in secondary school would affect students' academic achievement and psychosocial adjustment	**Sample**: 2,835 students who completed primary school in the sixth grade **Method**: Questionnaire	MANOVA	Grade retention resulted in short-term benefits for the retained students but in the medium term, there were no significant differences between the retained and promoted students in academic achievement
Author: Wofford (2016) **Title**:	To gain a deeper understanding of one teacher's perceptions of	**Sample**: 518 elementary students	Observation chart	Retention in kindergarten was a common practice that used to address the needs of

Retention in Kindergarten A Case Study of Teacher	retention in kindergarten, the feedback she gave students she felt were at risk of being retained, and the interventions she used with these students	**Method**: Interview		students and classroom teachers
Author: Yucel-Aybat, Gibney, Masters & Amlie (2018) **Title**: A Social Exchange Perspective on Student Retention and University Support Intentions	To provide a more comprehensive explication of student support and conversely, exit in an institutional context	**Sample**: 468 undergraduates Students **Method**: Questionnaire	AMOS 22.0.	Students who believe that the university is fulfilling its obligations are less likely to leave the school
Author: Budiman (2018) **Title**: Factors Related to Students' Drop Out of a Distance Language Learning	Examined the reasons for dropping out of a distance language learning program offered by an open university in Indonesia	**Sample**: 405 students **Method**: Questionnaire	NVivo	Some students enrolling in the program of studies have very limited knowledge and understanding of distance learning, including self-managed learning
Author: Yang, Chen, Rhodes & Orooji (2018) **Title**: A longitudinal study on risk factors of grade retention among Elementary school students using a multilevel analysis focusing on material hardship and lack of school engagement	Examines the relationship between material hardship, school engagement, and grade retention among at-risk elementary school children	**Sample**: 4329 students **Method**: Interview	Chi-square, T-tests	Children in families experiencing material hardship need interventions not only for basic needs but also for interventions that increase levels of engagement in school
Author: Ampofo-Ansah, Antiaye & Ampofo Ansah (2019) **Title**: Psychological contracts between university students and lecturers	Investigated the psychological contract between lecturers and students	**Sample**: 30 respondents: 15 first-year students 10 second-year students 5 academics from the lecturer **Method**: Interview	-	Students learning enthusiasm was promoted by lecturers performing their desired behavior, while students' learning initiative and efficiency are damaged when lecturers' desired behavior is unfavorable
Author: Beenen & Arbaugh (2019) **Title**: Flipping Class: Why Student Expectations and person situation fit matter	To explore why flipped classes may have both benefits and pitfalls	**Sample**: 96 undergraduates students **Method**: Questionnaire	CFA	Students who expected traditional in-person lecture-based instruction, yet received flipped instruction (indicative of contract violation) were less satisfied and less intent on taking a flipped class later, yet they showed more in-class effort than students who expected and received traditional instruction
Author: Bordia, Bordia, Milkovitz, Shen & Restubog	Examine the content, formation, and fulfillment of international student	**Sample**: 57 internationals	-	International students use social and institutional sources to create the

(2019) **Title**: What do international students really want: An exploration of the content of International students' psychological contract in business education	psychological contracts	students (Male 47, female 10) **Method**: Interview		contract, which, when fulfilled, leads to positive educational and psychological outcomes
Author: Russell & Jarvis (2019) **Title**: Student Withdrawal Retention and Their Sense of Belongings in their words	Provides insight into the students' experiences of non-continuation in one English University	**Sample**: 80 participants **Method**: Interview	-	Most students interviewed in this study experienced a mixture of internal and external factors that lead to their non-continuation
Author: Ugwuanyia, Ndujib, Elejerec & Omeked (2020) **Title**: Effect of Flipped Classroom and Think Pair Share Strategy on Achievement and Retention Among Senior Secondary School Physics Students	To determine the effect of flipped classrooms and think pair share strategy on achievement and retention among senior secondary school physics students	**Sample**: 3965 secondaries school student **Method**: Questionnaire	ANCOVA	The flipped classroom is superior in enhancing the achievement and retention of physics students
Author: Haverila & McLaughlin (2020) **Title**: Variables Affecting the Retention Intentions of students in higher education institutions: A Comparison between International and Domestic Students	To investigate the differences between domestic and international students with regard to the variables affecting students' retention intentions.	**Sample**: 395 college students **Method**: Questionnaire	ANOVA	The flipped classroom is superior in enhancing the achievement and retention of physics students
Author: James (2022) **Title**: Students as Stakeholders Understanding Expectations Can Increase Student Retention	To answer the following research question: RQ1: What is the relationship between adult students expectations of time commitment, technical and computer skills, and level of difficulty in their online classes and their academic persistence in the Phoenix Success Series?	**Sample**: 205 privates university student **Method**: Questionnaire	SPSS version 25	This study's findings provide insight into what students perceive in relation to time commitment, required technical and computer skills, and difficulty level for online classes, and how this perception might predict the degree to which they persisted in online courses
Author: Itzkovich (2021) **Title**: Constructing and validating students' psychological contract violation scale	To construct and validate the efficient measurement of the violations of the student-faculty psychological contract, capturing the different dimensions of	**Sample**: Phase1: 78 college students Phase2: 244 students Phase3: 154	PFI	Students expect to be emotionally involved in the process, feel it, be engaged with it, and consequently, emotionally aroused

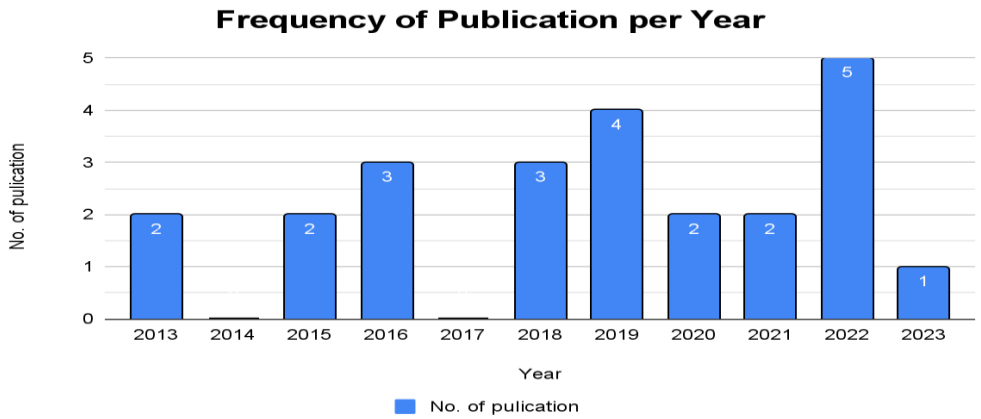
	such violations	undergraduates College students **Method**: Questionnaire		
Author: Loukeris & Soulis (2021) **Title**: Retention in Kindergarten for Students with Autism Spectrum Disorder Improvement Delusion or Both	Examined the impact of students' retention with ASD in their cognitive and social domain	**Sample**: 110 students **Method**: Questionnaire	Tukey HSD Post Hoc Test	The most significant improvement regarding retention is shown by the students with ASD who visit the integration class
Author: Robertson (2021) **Title**: To retain or not retain a review of literature related to kindergarten retention	Reviews some literature illustrating divergent views regarding kindergarten retention	**Sample**: 40 children	-	It is agreed that careful attention should be given to the decision to retain or promote children in kindergarten
Author: Boyd, Liu & Hirrisian (2022) **Title**: Impact of Community Experiences on Student Retention Perceptions and Satisfaction in Higher Education	To examine if a sense of community (which contains a subconstruct of belonging) is a better predictor of satisfaction and retention perceptions compared with academic achievement and engagement	**Sample**: 3,600 undergraduate enrollments **Method**: Questionnaire	AMOS CFA	Human connection and a sense that one belongs within a social group are powerful
Author: Mcculloh (2022) **Title**: An exploration of parental support in the retention of rural first-generation college students	Explored the parental support that promoted retention of rural FGCSs attending a small, private university, where withdrawal rates of this population are higher than that of continuing-generation students	**Sample**: 12 rural first generation college student **Method**: Interview	A qualitative inductive analysis	Support from those with whom they have close relationships, particularly parents, contributed to their accomplishments
Author: Pedler, Willis & Nieuwoudt (2022) **Title**: A sense of belonging at university student retention, motivation and enjoyment	To explore the relationships between university students' sense of belonging and student retention	**Sample**: 578 participants **Method**: Questionnaire	ANOVA	University students' sense of belonging is important to higher education institutions as it increases students' academic motivation and enjoyment in their studies, which can impact student achievement and reduces the likelihood of students considering leaving university before completing their studies, thus contributing to student retention
Author: Tantry & Sofi (2022) **Title**: Effectiveness of computer-aided	(1) To see how CAI compares to the lecture method when it	**Sample**: All students in class 10th	T-test	Learners who received computer-assisted training recalled more fundamental facts than pupils who received

instruction in academic achievement and retention of biological sciences secondary school students of Kashmir division	comes to how well class 10th students do in biological science (2) To compare class 10th students' retention levels in biology after being taught using the CAI technique versus the lecture mode of instruction			lecture-based teaching
Author: Fan, Trimble, Kember, Muir, Douglas, Wang, Masters & Mainsbridge (2023) **Title**: Supporting engagement and retention of online and blended--learning students	Investigated the perceptions of students in online and blended subjects, regarding both the academic and institutional support they were provided	**Sample**: 41 online and blended-learning students **Method**: Interview	Iterative thematic analysis	Lack of adequate support for purely online students at the institutional/central level and the school level

Analysis of Publication Trends

The number of publications per year between 2013 and 2023 is shown in Figure 2. The highest number of publications occurred in 2022, with a total of five articles. The lowest publication years were 2014 and 2017, with no articles published.

Figure 2: Frequency of publication per year



List of Papers per Journal

Table 4 presents the distribution of articles across various journals. The "Journal of College Student Retention: Research, Theory, and Practice" published the most articles, with a total of four.

Table 4: List of Journal

No.	Journal	No. of Journal
1	Journal for the Study of Sports and Athletes in Education	1
2	Advances and Applications in Mathematical Sciences	1
3	ASEAN Journal of Open Distance Learning	1
4	Children and Youth Services Review	1
5	Frontiers in psychology	1

6	International Journal of Sciences: Basic and Applied Research	1
7	Journal of Applied Sport Management	1
8	Journal of College Student Retention: Research, Theory and Practice	4
9	Journal of Curriculum and Teaching	1
10	Journal of Further and Higher Education	1
11	Journal of International Students	1
12	Journal of Political Science Education	1
13	Learning and Individual Differences	1
14	Philanthropy & Education	1
15	Research in Educational Administration & Leadership	1
16	Scientific Research Publishing	1
17	Studies in Higher Education	2
18	The Australian Educational Researcher	1
19	The International Journal of Management Education	1
20	The Journal for Undergraduate Ethnography	1
	TOTAL	**24**

Publication by Authors

Table 5 summarizes the authorship patterns. Articles authored by a single individual and those with more than three authors each contributed 29.17% of the total, while articles with two or three authors contributed 20.83% each.

Table 5: Authors' Contribution

Number of authors	Frequency	Percentage (%)
Single author	7	29.17%
Two authors	5	20.83%
Three authors	5	20.83%
More than three authors	7	29.17%
TOTAL	**24**	**100.00%**

Tools and Techniques Applied

The studies employed a range of tools and techniques, with Confirmatory Factor Analysis (CFA), AMOS, and SPSS being among the most frequently used. Table 6 provides a detailed breakdown of the tools and techniques mentioned in the reviewed articles.

Table 6: Tools and techniques mentioned

Tools & techniques	No. of papers
AMOS	2
ANCOVA	1
ANOVA	2
MANOVA	1
CFA	3
Chi-square	1
Iterative thematic analysis	1
Logistic Regression Results	1
Cronbach's alphas	1
Means tests, logit models, and OLS regression	1
NVivo version 10	1
Observation chart	1
PFI	1
Smart PLS Program	1
SPSS	2
T-test	1

Fields of Knowledge

The reviewed articles covered various fields of knowledge, including kindergarten, sports, physics, biology, business studies, and higher education. A significant portion of the articles did not specify a particular field, reflecting the broad applicability of the psychological contract concept.

Table 7: Number of papers by field of knowledge.

Field of Knowledge	N
Kindergarten	2
Sports	1
Physics	1
Biology	1
Business	2
Primary school	1
International and domestic education	1
Higher education	1
English Education	1
Elementary school	1
Not specified	12
TOTAL	**24**

Strengths and Limitations
This review followed the PRISMA guidelines to ensure a comprehensive search and selection process. By broadening the search terms and databases, the review aimed to capture a wide range of relevant studies. However, the study was limited to 24 articles from 20 journals, which may not fully represent the global research landscape.

Discussion
This section presents the findings from the systematic literature review (SLR) in alignment with the research themes that guided the analysis. The analysis of the objectives, methodologies, and outcomes of the included studies reveals a significant impact of the psychological contract on student retention in educational contexts. Notably, when students perceive that their expectations and the promises made by their institutions are fulfilled, they are more likely to remain enrolled and continue their studies until completion.

5. Psychological Contract from the Student Perspective (Higher Education Students)

Koskina (2013) explored students' understanding of the psychological contract in a higher education context. Her findings suggest that the psychological contract perceived by students differs from that in employment contexts. Students primarily expect the university to provide necessary learning resources in exchange for their tuition fees, and they expect instructors to deliver quality education, while they, in turn, engage and participate actively in learning activities.

Beenen & Arbaugh (2019) examined the psychological contract in the context of flipped classrooms. Their study found that students who anticipated traditional teaching methods but experienced flipped instruction perceived this as a breach of the psychological contract, leading to dissatisfaction. However, these students still demonstrated increased effort in the classroom despite their dissatisfaction, indicating complex reactions to perceived breaches in the psychological contract.

Fulfillment of the Psychological Contract in Students
The concept of psychological contract fulfillment, where both parties meet their expectations, was found to be critical in fostering positive educational outcomes. Bordia et al. (2019) conducted a study on international students in Australian business schools, finding that fulfillment of the psychological contract led to positive psychological and educational outcomes. This was further supported by Aybat (2018), who found that psychological contract fulfillment is linked to higher student retention and future alumni engagement.

Breach of the Psychological Contract in Students
Conversely, breaches in the psychological contract, where expectations are unmet, often lead to negative outcomes. Barnhill et al. (2013) explored the impact of perceived breaches in psychological contracts among student-athletes, revealing that such breaches negatively affect their emotional and academic engagement. This was echoed in Itzkovich (2021), where unmet expectations by faculty members led to perceived breaches, negatively impacting student motivation and learning experiences.

Pleitz (2015) linked breaches in psychological contracts to higher attrition rates, noting that a significant gap between student expectations and actual experiences contributes to student dropout. Similarly, Ampofo (2019) found that breaches in psychological contracts, particularly when lecturers failed to meet student expectations, led to decreased student enthusiasm and a reluctance to recommend the institution to potential new students.

Connection with Teachers and Retention
Glazier (2016) highlighted the importance of teacher-student connections in promoting student retention, particularly in online learning environments. The study found that students who felt a strong connection with their instructors were more likely to succeed and continue their studies, emphasizing the role of instructor rapport in improving retention rates.

Retention Across Educational Levels
Retention strategies have been examined across various educational levels. In kindergarten, Loukeris (2021) found that retention practices significantly benefited students with Autism Spectrum Disorder (ASD) in both

social and cognitive domains. At the elementary level, Wofford (2016) observed that retention is often used to prepare students for subsequent grade levels, while Mi Youn Yang (2018) identified a correlation between low school engagement and grade repetition.

In secondary education, Klapproth et al. (2016) and Christian et al. (2020) demonstrated that retention strategies, such as grade repetition and flipped classrooms, can have both positive and negative impacts on student academic achievement and psychosocial adjustment.

Retention in Higher Education

Retention in higher education is influenced by various factors, including university support and the sense of community. Russell & Jarvis (2019) and Boyd et al. (2022) emphasized the importance of a supportive university environment in promoting student retention. Pedler, Willis, and Nieuwoudt (2022) found that students with a strong sense of belonging were more motivated and likely to persist in their studies. McCulloh (2022) also identified the critical role of parental support in the retention of first-generation college students.

Retention in Online and Distance Learning

Retention challenges are also prevalent in online and distance learning contexts. Budiman (2018) and James (2022) identified factors such as poor teaching quality, lack of communication, and insufficient student-teacher interaction as significant contributors to dropout rates in online courses. Effective communication and support mechanisms were found to be essential in mitigating these challenges and improving retention in online education.

Retention Among International and Domestic Students

Haverila and McLaughlin (2020) examined the differences in retention factors between international and domestic students, finding that while both groups face similar challenges, international students have unique needs that must be addressed by educational institutions to enhance retention.

In summary, the review highlights the critical role of the psychological contract in shaping student retention across various educational levels and contexts. The findings underscore the need for educational institutions to understand and manage student expectations effectively to foster positive educational outcomes and reduce attrition.

Conclusion

This systematic review has delved into the intricate relationship between psychological contracts and student retention, spanning from kindergarten to higher education and across various learning environments, including traditional, online, and distance education. Our exploration underscores how crucial it is for educational institutions to understand and manage students' expectations and experiences, as these factors heavily influence their decisions to stay or leave.

The review highlights a clear pattern: when students feel that their expectations are met and their needs are supported, they are more likely to stay committed and engaged with their studies. On the other hand, when these expectations are not fulfilled, dissatisfaction grows, which can lead to students dropping out or losing motivation. Building strong, supportive relationships between students and faculty, as well as creating a welcoming and inclusive environment, are essential steps toward enhancing student retention.

Our findings also point to the importance of aligning institutional practices with the diverse needs of students, particularly in online and distance learning settings. Ensuring that students feel connected and supported can make a significant difference in their academic journey.

There's still much to explore in this field. Future research could benefit from examining a wider range of sources and including students from various educational levels and backgrounds to gain a more comprehensive understanding. By addressing these gaps, we can develop more effective strategies to support students and improve retention rates.

In summary, understanding and managing psychological contracts is key to fostering a positive educational experience. By focusing on students' needs and expectations, educational institutions can build a stronger, more supportive environment that encourages students to stay and succeed.

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Personal Bankruptcy Prediction Using Logistic Regression Model

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Abstract: According to the Insolvency Department of Malaysia, as of December 2023, 233,483 Malaysians are currently involved in bankruptcy cases due to their defaults on hire purchase loans, credit card loans, personal loans, housing loans, and business loans. This is indeed a critical issue because the growing number of personal bankruptcy cases will hurt the Malaysian economy as well as society. From an individual's economic perspective, bankruptcy minimizes their chances of getting a job. Apart from that, their accounts will be frozen, they will lose control of their properties and assets, and they will not be allowed to start any business or be a part of any company's Board of Directors. Bankrupts also will be rejected from any loan application. This paper examines this problem by developing a personal bankruptcy prediction model using the logistic regression technique. This paper defines "bankrupt" as terminated members who failed to settle their loans. The sample comprised 24,546 cases with 17% settled cases and 83% terminated cases. The data included a dependent variable, i.e., bankruptcy status (Y=1(bankrupt), Y=0(non-bankrupt)), and 12 predictors. Upon completion, this paper succeeds in coming out with a reliable personal bankruptcy prediction model and significant variables of personal bankruptcy. The findings of this paper are very beneficial and significant to creditors, banks, the Malaysia Department of Insolvency, potential borrowers, members of AKPK, and society in general in raising awareness of personal bankruptcy risks and such information may help them to take preventive measures in minimizing the number of personal bankruptcy cases.

Keywords: *Bankruptcy, business loans, loan Malaysian Economy*

1. Introduction and Background

Personal bankruptcy has been a topic of extensive interest because personal bankruptcy filings are an important indicator of household financial problems nationally (International Monetary Fund, 2017; Garrido et al., 2020). In Malaysia, personal bankruptcy cases have been on an upward trend since 2007. However, from 2014 until 2018, the trend has been up and down with not less than twelve thousand cases per year (Malaysia Department of Insolvency, 2019). In addition, from 2020 to 2022, the trend has decreased, with 7221 cases in 2020, 6554 cases in 2021, and 5695 cases in 2022. (Malaysia Department of Insolvency, 2020,2021,2022). This was due to the amendment of the bankruptcy threshold amount. In Malaysia, a debtor is declared bankrupt, under an Adjudication Order made by the High Court against the debtor if he is unable to pay his debts of at least RM30,000.00 (Malaysia Department of Insolvency, 2017). On 29th of March 2017, the Bankruptcy (Amendment) Bill 2016 was passed in the Dewan Rakyat. Among the major changes to the Bankruptcy Act 1967 were substituting the term 'bankruptcy' in all proceedings to 'insolvency', the threshold to be declared as bankrupt increased to RM50k debt amount, automatically releasing bankrupts after three years and social guarantors cannot be declared bankrupt. Again in 2020, the Parliament sought to amend the Bankruptcy Act 1967 by increasing the minimum debt threshold for the presentation of a bankruptcy petition, from RM50,000 to RM100,000 (Malaysia Department of Insolvency, 2020)

As of December 2023, the Malaysia Department of Insolvency reported that the total accumulated number of bankrupt individuals was 233,483. These bankruptcy cases are mainly due to defaults in personal loans, business loans, housing loans, hire purchases, and credit cards (Malaysia Department of Insolvency, 2023). This is alarming because if the number of personal bankruptcy cases continues to increase, it will hurt the Malaysian economy and society. From the aspect of individuals' economy, bankruptcy minimizes their chances of securing a job.

As one of the efforts taken to curb the increasing household debt which mainly leads to personal bankruptcy, Bank Negara Malaysia has set up a debt management agency, Agensi Kaunseling and Pengurusan Kredit. This

agency is an avenue for potential individual borrowers and distressed borrowers to acquire assistance and seek advice in managing their debts and finances. Data used in this paper were provided by this agency. Thus, this paper illustrates the application of data mining techniques to determine the conditional probability of a borrower belonging to a class (bankrupt or non-bankrupt) using the logistic regression technique. The findings from this paper are useful for various parties to make decisions and take action, such as the management level of insolvency departments, banks, debt management agencies, hire-purchase companies, and credit companies. These actions are important to avoid or prevent default payments, bad debts, and personal bankruptcy. Therefore, the objectives of this paper are to identify the significant variables and to determine the conditional probability of a borrower belonging to a class (bankrupt or non-bankrupt) using the logistic regression technique.

2. Literature Review

Bankruptcy is a legal declaration of financial insolvency for an individual or firm that allows certain legal protections to both debtors and creditors (Cohen, 2015). It is crucial to have a better understanding of the causes of personal bankruptcy to provide practical solutions to this financial problem. Korol (2022) mentioned that forecasting consumer bankruptcy risk has received increasing scientific and public attention. In addition, Brygala and Korol (2024), indicated that it has become important to have an early prediction model that provides accurate assurance for users about the financial situation of consumers.

According to Papana and Spyridou (2020), research on bankruptcy prediction is of the utmost importance as it aims to build statistical models that can distinguish healthy firms from financially distressed ones. Meanwhile, Smiti et. Al., (2024) added that bankruptcy prediction is considered one of the most important research topics in the field of finance and accounting. The rapid increase of data science, artificial intelligence, and machine learning has led researchers to build an accurate bankruptcy prediction model.

Because it is critical to develop an effective bankruptcy prediction model, a few researchers discovered that logistic regression is the most commonly used statistical method for assessing consumer credit risk (Paleologo et al., 2010; Finlay, 2009). According to Li and Zhong (2012), logistic regression can forecast an applicant's default likelihood and identify the characteristics associated with his or her default behavior. Furthermore, Brygala (2022) employed logistic regression to anticipate household consumer bankruptcy and discovered that the logit model with a balanced sample has better predictive performance. In addition, Sahiq et al. (2021) employed the logistic regression model and effectively found that the primary factors of personal bankruptcy filings were demographic indicators, socioeconomic status indicators, debt indicators, financial indicators, social stigma indicators, behavioral indicators, and macroeconomic indicators.

3. Research Methodology

This study involved a dataset obtained from an authorized debt management agency. The data consisted of settled members and terminated members. Settled members were those who managed to settle their loans, while terminated were those who were unable to pay their loans. There were 4,174 settled members and 20372 terminated members. The total sample size was 24,546 with 17.0% (4,174) settled and 82.99% (20,372) terminated cases. It is noted here that the negative instances belong to the majority class (terminated) and the positive instances belong to the minority class (settled); an imbalanced dataset. According to Akosa (2017), the most commonly used classification algorithms dataset (e.g. scorecard, logistic regression, and decision tree) do not work well for imbalanced datasets. This is because the classifiers tend to be biased towards the majority class and therefore perform poorly on the minority class. He added, that to improve the performance of the classifiers or model, down-sampling or up-sampling techniques can be used. This paper deployed the random undersampling technique. The random undersampling technique is considered a basic sampling technique in handling imbalanced datasets (Yap, Rahman, He & Bulgiba, 2016). Random undersampling (RUS), also known as down-sampling, excludes the observations from the majority class to balance with the number of available observations in the minority class. The RUS was used by randomly selecting 4,174 cases from the 20,372 terminated cases. This RUS process was done using the IBM Statistical Package for the Social Science (SPSS) software. Therefore, the total sample size was 8,348 with 50% (4,174) representing settled cases and 50% (4,174) representing terminated cases for the balanced dataset. This paper used both sample sizes for further

analysis to see the differences in the results of the statistical analysis.

The data covered the period from 1st January 2010 to 31st October 2015, which were received in Excel files. Data cleaning was the first step to remove outliers and redundant data. Once the data cleaning process was completed, the Excel data file was converted into a SAS file using SAS 9.4 software. The logistic regression model was run using the SAS Enterprise Miner 14.1 software.

Logistic regression is an extensively used statistical modeling technique in which the probability of a dichotomous outcome (Y=0 or Y=1) is related to a set of potential predictor variables. The objective of a logistic regression model in personal bankruptcy prediction is to determine the probability of an individual belonging to a class (bankrupt or non-bankrupt), given the values of the independent variables of that individual (Hosmer & Lemeshow, 2013). For this study, logistic regression was used to model the event Y= 1(bankrupt).

The logistic regression model is written as:

$$\log\left[\frac{pi}{1-pi}\right] = \boldsymbol{\beta 0} + \boldsymbol{\beta_1 X_{j1}} + \boldsymbol{\beta_2 X_{j2}} + \ldots\ldots + \boldsymbol{\beta_k X_{jk}}$$

Where
p_i = P(Y=1) for each case or observation, i = 1,2,…,n
β_0 = intercept of the logistic regression equation
β_j = the coefficient of the predictor variables, j= 1,2…..k
X_j = the predictor variable, j = 1,2,…k

In this logistic regression model, maximum likelihood is used to estimate parameters β_1 to β_k. These parameter estimates measure the rate of change of logit for one unit change in the input variable (adjusted for other inputs), that is, they are the slopes of the regression line between the target and their respective input variables X_1 to X_k. The parameters are dependent on the unit of the input (Siddiqi, 2006).
Whereas, Wald statistics is an alternative test that is commonly used to test the significance of individual logistic regression coefficient resulting in identifying the variables that influence the dependent variable (bankruptcy status):

H_o: $\beta_1 = 0$ (the independent variable does not affect the dependent variable)
H_1: $\beta_1 \neq 0$ (the independent variable affects the dependent variable)

The Wald test calculates z statistics, $z = \left(\frac{B}{SE}\right)$ Where B is the regression coefficient estimation and SE is the standard error of estimation. The Z value is then squared where the Wald statistic follows the Chi-square distribution ($z^2 \sim x12$) with the Wald statistic now:

Wald Statistic = $Z^2 = \left(\frac{B}{SE}\right)^2$

Reject H_o if Wald statistic > $x^2_{\infty,1}$ or p-value< 0.05 ((Katsaragakis et. Al., 2005)

4. Results

This study used the stepwise method in developing the logistic regression model. The stepwise method is useful and intuitively appealing in that it sequentially builds models and it allows for the examination of a collection of models which might not otherwise have been examined (Hosmer et al., 2013). This method was involved in adding and removing characteristics (variable) dynamically from the model in each step until the best combination of characteristics (variable) was achieved. The significance level used in this study was 0.05. Therefore, the best combination of characteristics (variable) is whereby when the p-value of individual characteristics is less than 0.05. Statistical measures like Chi-square or Standardized estimates were used to measure the strength of the predictive model (Siddiqi, 2006). The results showed that the logistic regression models based on imbalanced and balanced datasets were statistically significant. The logistic regression model (imbalanced dataset) was statistically significant with a likelihood ratio of 2542.7031, degree of freedom of 30, and p-values < 0.0001 (Table 1). Meanwhile, the logistic regression model based on a balanced dataset was also

statistically significant with a likelihood ratio of 1588.3079, degree of freedom of 27, and p-values <0.0001(Table 2).

Table 1: Logistic Regression Model Results (Imbalanced Dataset)

	Likelihood Ratio Test	**DF**	**Likelihood Ratio Chi-Square**	**P-value**
	Logistic Regression model	**30**	**2542.7031**	**<.0001**
No	**Variables**	**DF**	**Wald Chi-Square**	**P-value**
1	Age	4	19.2614	0.0007
2	Gender	1	10.3994	0.0013
3	Race	2	123.4855	<.0001
4	Marital Status	3	18.1206	0.0004
5	Number of Children	3	53.4015	<.0001
6	Employment Status	4	117.5712	<.0001
7	Household Monthly Income	3	164.7161	<.0001
8	Household Monthly Expenses	3	16.8579	0.0008
9	Outstanding Loan	5	395.2122	<.0001
10	Number of Loans	2	306.5579	<.0001
11	Location of Residence	-	-	-
12	Experience of adversities	-	-	-

Table 2: Logistic Regression Model Results (Balanced Dataset)

	Likelihood Ratio Test	**DF**	**Likelihood Ratio Chi-Square**	**P-value**
	Logistic Regression model	**27**	**1588.4307**	**<.0001**
No	Variables	DF	Wald Chi-Square	P-value
1	Age	4	16.3079	0.0026
2	Gender	1	9.6735	0.0019
3	Race	2	64.9646	<.0001
4	Marital Status	-	-	-
5	Number of Children	3	35.3943	<.0001
6	Employment Status	4	90.9931	<.0001
7	Household Monthly Income	3	87.1208	<.0001
8	Household Monthly Expenses	3	14.0243	0.0029
9	Outstanding Loan	5	243.7229	<.0001
10	Number of Loans	2	204.5720	<.0001
11	Location of Residence	-	-	-
12	Experience of adversities	-	-	-

Based on Table 1 and Table 2, for logistic regression model that is based on imbalanced dataset, the best combination of characteristics (variables) resulting in (10) significant variables (age, race, gender, number of children, employment status, household monthly income, household monthly expenses, outstanding loan, number of loans and marital status) and nine (9) significant variables (age, race, gender, number of children, employment status, household monthly income, household monthly expenses, outstanding loan and number of loans) for logistic regression model that is based on balanced dataset.

Table 3: Analysis of Maximum Likelihood Estimates (Imbalanced Dataset)

Variable	Category	DF	Estimate	P-value	Odd ratio (Exp(Est))
Intercept	-	1	3.6192	<.0001	37.308
Age	1 (20-29)	1	-0.0899	0.1394	0.914
Age	2 (30-39)	1	-0.00791	0.8736	0.992
Age	3 (40-49)	1	0.1636	0.0037	1.178
Age	4 (50-59)	1	-0.1456	0.0224	0.864
Employment status	PRS (Private)	1	-0.1051	0.0666	0.900
Employment status	PUS (Public)	1	-0.4826	<.0001	0.617
Employment status	R (Retired)	1	-0.1884	0.1892	0.828
Employment status	SE (Self-employed)	1	0.4726	<.0001	1.604
Gender	F (Female)	1	-0.0783	0.0013	0.925
Household Monthly Expenses	1 (<RM1k)	1	0.0614	0.2735	1.063
Household Monthly Expenses	2 (RM1,001-RM2,000)	1	0.0464	0.2490	1.048
Household Monthly Expenses	3 (RM2,001-RM3,000)	1	0.1740	0.0010	1.190
Household Monthly Income	1 (<RM1k)	1	0.5488	<.0001	1.731
Household Monthly Income	2 (RM1,001-RM2,000)	1	0.2053	<.0001	1.228
Household Monthly Income	3 (RM2,001-RM3,000)	1	-0.0900	0.0698	0.914
Outstanding Loan	1(≤RM29.9k))	1	-1.2892	<.0001	0.275
Outstanding Loan	2(RM30k-RM59.9k)	1	-0.3551	<.0001	0.701
Outstanding Loan	3(RM60k-RM89.9k)	1	-0.1406	0.1239	0.869
Outstanding Loan	4(RM90k-RM119.9k)	1	0.4967	0.0006	1.643
Outstanding Loan	5(RM120k-RM149.9k)	1	0.3658	0.0297	1.442
Marital Status	D(Divorce)	1	0.0848	0.3414	1.088
Marital Status	M(Married)	1	-0.0511	0.3734	0.950
Marital Status	S(Single)	1	-0.2919	<.0001	0.747
Number of Children	1 (0)	1	-0.2669	<.0001	0.766
Number of Children	2 (1-3)	1	-0.2455	<.0001	0.782
Number of Children	3 (4-6)	1	0.1430	0.0095	1.154
Number of loans	1 (1-4)	1	-1.1387	<.0001	0.320
Number of loans	2 (5-8)	1	-0.0458	0.5493	0.955
Race	C (Chinese)	1	-0.4235	<.0001	0.655
Race	I (Indian)	1	0.3221	<.0001	1.380

Table 4: Analysis of Maximum Likelihood Estimates (Balanced Dataset)

Variable	Category	DF	Estimate	P-value	Odd ratio (Exp(Est))
Intercept	-	1	1.9033	<.0001	6.708
Age	1 (20-29)	1	-0.0724	0.3800	0.930
Age	2 (30-39)	1	0.0802	0.2355	1.084
Age	3 (40-49)	1	0.2090	0.0055	1.232
Age	4 (50-59)	1	-0.1817	0.0307	0.834
Employment status	PRS (Private)	1	-0.2016	0.0080	0.817
Employment status	PUS (Public)	1	-0.6682	<.0001	0.513
Employment status	R (Retired)	1	0.0411	0.8275	1.042
Employment status	SE (Self-employed)	1	0.4632	<.0001	1.589
Gender	F (Female)	1	-0.1025	0.0019	0.903
Household Monthly Expenses	1 (<RM1k)	1	0.0619	0.4331	1.064
Household Monthly Expenses	2 (RM1,001-RM2,000)	1	0.0886	0.1170	1.093

Household Monthly Expenses	3 (RM2,001-RM3,000)	1	0.2293	0.0021	1.258
Household Monthly Income	1 (<RM1k)	1	0.4759	0.0006	1.609
Household Monthly Income	2 (RM1,001-RM2,000)	1	0.2309	0.0003	1.260
Household Monthly Income	3 (RM2,001-RM3,000)	1	-0.0347	0.5947	0.966
Outstanding Loan	1(≤RM29.9k))	1	-1.2809	<.0001	0.278
Outstanding Loan	2(RM30k-RM59.9k)	1	-0.3006	0.0005	0.740
Outstanding Loan	3(RM60k-RM89.9k)	1	0.0222	0.8406	1.022
Outstanding Loan	4(RM90k-RM119.9k)	1	0.3701	0.0260	1.448
Outstanding Loan	5(RM120k-RM149.9k)	1	0.0914	0.6159	1.096
Number of Children	1 (0)	1	-0.2820	0.0002	0.754
Number of Children	2 (1-3)	1	-0.2004	0.0009	0.818
Number of Children	3 (4-6)	1	0.2295	0.0010	1.258
Number of loans	1 (1-4)	1	-1.1474	<.0001	0.317
Number of loans	2 (5-8)	1	-0.0744	0.3764	0.928
Race	C (Chinese)	1	-0.4237	<.0001	0.655
Race	I (Indian)	1	0.3661	<.0001	1.442

Table 3 and Table 4 display the Analysis of Maximum Likelihood Estimates results. In these results, the Odds ratio (OR) is used to measure the strength of association between the predictor variable and the predicted event (Wuensch, 2015; Hailpern & Visintainer, 2003). The predicted event in this study was bankrupt or non-bankrupt. From the odds ratio, it can be determined which category is more or less likely to be bankrupt. Guidelines for interpreting the odds ratio are as per below (Yap et al.,2011):

- If the ratio of category A vs R (reference category) is greater than one, it indicates that those in category A are more likely to be bankrupt.
- If the ratio of category A vs R (reference category) is less than one, it indicates that those in category A are less likely to be bankrupt.
- If the ratio of category A vs R (reference category) is equal to one, it indicates that cases in both A and R are equally likely to be bankrupt.

For reference category, SAS Enterprise E-miner automatically creates (number of categories; c - 1) dummy variables for categorical variables with c levels. The dummy variables for categorical variables with c levels are depicted in Table 5.

Table 5: Dummy Variables for Categorical Variables

Independent Variable	Dummy variables
Age (5 categories) - 20-29, 30-39, 40-49 50-59, 60 & above	4 dummy variables (5-1 = 4) 1,0,0,0 (20-29), 0,1,0,0(30-39), 0,0,1,0(40-49), 0,0,0,1 (50-59), ***0,0,0,0(60 & above)***
Employment status (5 categories) - Private sector (PRS), Public sector (PUS), Retiree (R), Self-employed (SE), Unemployed (U)	4 dummy variables (5-1 = 4) 1,0,0,0 (PRS), 0,1,0,0(PUS), 0,0,1,0(R), 0,0,0,1 (SE), ***0,0,0,0(U)***
Gender (2 categories)- Female, Male	1 dummy variable (2-1 = 1) 1(Female), 0 (Male)
Household Monthly Expenses (4 categories) - <RM1,000, RM1,001-RM2,000, RM2,001-RM3,000, >RM3,000	3 dummy variables (4-1=3) 1,0,0, (<RM1000), 0,1,0,(RM1001-RM2000), 0,0,1,(RM2001-RM3000), ***0,0,0 (>RM3,000)***
Household Monthly Income (4 categories) <RM1,000, RM1,001-RM2,000, RM2,001-RM3,000, >RM3,000	3 dummy variables (4-1=3) 1,0,0, (<RM1000), 0,1,0,(RM1001-RM2000), 0,0,1,(RM2001-RM3000), ***0,0,0 (>RM3,000)***
Outstanding Loan (6 categories) <RM29.9k, RM30k-RM59.9k, RM60k-RM89.9k, RM90k- RM119.9k,	5 dummy variables (6-1=5)

RM120k-RM149.9k, >RM150,000	1,0,0,0,0(<RM29.9k), 0,1,0,0,0(RM30k-RM59.9k), 0,0,1,0,0(RM60k-RM89.9k)), 0,0,0,1,0 (RM90k-RM119.9K), 0,0,0,0,1(RM120k-RM149.9k), ***0,0,0,0,0 (>RM150k)***
Marital status (4 categories) – Divorced, Married, Single, Widow	3 dummy variables (4-1=3) 1,0,0 (Divorced), 0,1,0(Married), 0,0,1(Single), ***0,0,0 (Widow)***
Number of Children (4 categories) 0, 1-3, 4-6, 7 & above	3 dummy variables (4-1=3) 1,0,0 (0), 0,1,0(1-3), 0,0,1(4-6), ***0,0,0 (7& above)***
Number of Loans (3 categories) 1-4, 5-8, 9 & above	2 dummy variables (3-1=2) 1,0 (1-4), 0,1(5-8), ***0,0(4-6)***
Race (3 categories) – Chinese, Indian, Malay	2 dummy variables (3-1=2) 1,0 (Chinese), 0,1(Indian), ***0,0(Malay)***

*The reference category for each variable is bold and italicized

Referring to Table 3 for the imbalanced dataset, the significant variables are those variables with a p-value less than 0.05. Below are the interpretations of the odds ratio for the significant variables.

Age

(OR=1.178): Borrowers who are between 40 to 49 years old are slightly more likely to be bankrupt compared to borrowers aged 60 and above.

(OR=0.864): Borrowers who are between 50 to 59 years old are less likely to be bankrupt compared to borrowers aged 60 and above.

Race

(OR=0.655): Borrowers who are Chinese are less likely to be bankrupt compared to those who are Malay.

(OR=1.380): Borrowers who are Indian are 1.4 times more likely to be bankrupt compared to borrowers who are Malay.

Gender

(OR=0.925): Female borrowers are less likely to be bankrupt compared to male borrowers.

Number of Children

(OR=0.766): Borrowers who have no child are less likely to be bankrupt compared to borrowers with children 7 and above.

(OR=0.782): Borrowers who have 1 to 3 children are less likely to be bankrupt compared to those with children 7 and above.

(OR=1.154): Borrowers who have 4 to 6 children are slightly more likely to be bankrupt compared to borrowers with children 7 and above.

Marital Status

(OR=0.747): Single Borrowers are less likely to be bankrupt compared to borrowers who are widows.

Employment Status

(OR=0.617): Borrowers who are attached to the Public sector are less likely to be bankrupt compared to Unemployed borrowers.

(OR=0.1604): Self-employed Borrowers are 1.6 times more likely to be bankrupt compared to Unemployed borrowers.

Household Monthly Income

(OR=1.731): Borrowers who earn RM1,000 and below are 1.7 times more likely to be bankrupt compared to borrowers who earn RM3k and above.

(OR=1.228): Borrowers who earn RM1,001-RM2,000 are slightly more likely to be bankrupt compared to borrowers who earn RM3k and above.

Household Monthly Expenses

(OR=1.190): Borrowers who spend between RM2,001 to RM3,000 are slightly more likely to be bankrupt compared to borrowers who spend RM3k and above.

Outstanding Loan

(OR=0.275): Borrowers with outstanding loans of RM29,999 and below are less likely to be bankrupt compared to borrowers with outstanding loans of more than RM150k.

(OR=0.701): Borrowers with outstanding loans between RM30,000 to RM59,999 are less likely to be bankrupt compared to borrowers with outstanding loans of more than RM150k.

(OR=1.643): Borrowers with outstanding loans between RM90,000 to RM119,999 are 1.6 times more likely to be bankrupt compared to borrowers with outstanding loans of more than RM150k.
(OR=1.442): Borrowers with outstanding loans between RM120,000 to RM149,999 are 1.4 times more likely to be bankrupt compared to borrowers with outstanding loans of more than RM150k.
Number of Loans
(OR=0.320): Borrowers who have 1 to 4 loans are less likely to be bankrupt compared to borrowers with 9 loans and above.

Next, based on Table 4, below are the interpretations of odd ratios for the significant variables for the balanced dataset. The significant variables are those variables with a p-value less than 0.05.
Age
(OR=1.232): Borrowers who are between 40 to 49 years old are slightly more likely to be bankrupt compared to borrowers aged 60 and above.
(OR=0.834): Borrowers who are between 50 to 59 years old are less likely to be bankrupt compared to borrowers aged 60 and above.
Race
(OR=0.655): Borrowers who are Chinese are less likely to be bankrupt compared to those who are Malays.
(OR=1.442): Borrowers who are Indian are 1.4 times more likely to be bankrupt compared to borrowers who are Malay.
Gender
(OR=0.903): Female borrowers are less likely to be bankrupt compared to male borrowers.
Number of Children
(OR=0.754): Borrowers who have no child are less likely to be bankrupt compared to borrowers with 7 children and above.
(OR=0.818): Borrowers who have 1 to 3 children are less likely to be bankrupt compared to borrowers with 7 children and above.
(OR=1.258): Borrowers who have 4 to 6 children are slightly more likely to be bankrupt compared to borrowers with 7 children and above.
Employment Status
(OR=0.817): Borrowers who are attached to the Private sector are less likely to be bankrupt compared to Unemployed borrowers.
(OR=0.513): Borrowers who are attached to the Public sector are less likely to be bankrupt compared to Unemployed borrowers.

(OR=1.589): Self-employed Borrowers are 1.5 times more likely to be bankrupt compared to unemployed borrowers.
Household Monthly Income
(OR=1.609): Borrowers who earn RM1,000 and below are 1.6 times more likely to be bankrupt compared to borrowers who earn RM3k and above.
(OR=1.206): Borrowers who earn RM1,001-RM2,000 are slightly more likely to be bankrupt compared to borrowers who earn RM3k and above.
Household Monthly Expenses
(OR=1.258): Borrowers who spend between RM2,001 to RM3,000 are slightly more likely to be bankrupt compared to borrowers who spend RM3k and above.
Outstanding Loan
(OR=0.278): Borrowers with outstanding loans of RM29,999 and below are less likely to be bankrupt compared to borrowers with outstanding loans of more than RM150k.
(OR=0.470): Borrowers with outstanding loans between RM30,000 to RM59,999 are less likely to be bankrupt compared to borrowers with outstanding loans of more than RM150k.
(OR=1.448): Borrowers with outstanding loans between RM90,000 to RM119,999 are 1.4 times more likely to be bankrupt compared to borrowers with outstanding loans of more than RM150k.
Number of Loans
(OR=0.317): Borrowers who have 1 to 4 loans are less likely to be bankrupt compared to borrowers with 9 loans and above.

Therefore, based on Table 3 and Table 4, the estimated logistic regression for the imbalanced dataset and the balanced dataset is written as below:

Logistic Regression model (Imbalanced Dataset)

$\log\left[\frac{pi}{1-pi}\right]$ = 3.6192 – 0.0899(Age 1) – 0.00791(Age 2) + 0.1636(Age 3) – 0.1456(Age 4) – 0.1051(PRS) – 0.4826(PUS) – 0.1884(R) + 0.4726(SE) – 0.0783(F) + 0.0614 (HME 1) + 0.0464(Household Monthly Expenses 2) + 0.1740(Household Monthly Expenses 3) + 0.5488(Household Monthly Income 1) + 0.2053 (Household Monthly Income 2) – 0.0900(Household Monthly Income 3) – 1.2892(Outstanding loan 1) – 0.3551(Outstanding loan 2) – 0.1406(Outstanding loan 3) + 0.4967(Outstanding loan 4) + 0.3658 (Outstanding loan 5) + 0.0848(D) – 0.0511(M) – 0.2919(S) – 0.2669(No of child 1) – 0.2455(No of child 2) + 0.1430(No of child 3) – 1.1387(No of loans 1) – 0.0458(No of loans2) – 0.4235(Chinese) + 0.3221(Indian).

Logistic Regression model (Balanced Dataset)

$\log\left[\frac{pi}{1-pi}\right]$ = 1.9033 – 0.0724(Age 1) + 0.0802(Age 2) + 0.2090(Age 3) – 0.1817(Age 4) – 0.2016(PRS) – 0.6682(PUS) + 0.0411(R) + 0.4632(SE) – 0.1025(F) + 0.0619(HME 1) + 0.0886(HME 2) + 0.2293(HME 3) + 0.4759(HMI 1) + 0.2309(HMI 2) – 0.0347(HMI 3) – 1.2809(Outstanding loan 1) – 0.3006 (Outstanding loan 2) + 0.0222(Outstanding loan 3) + 0.3701(Outstanding loan 4) + 0.0914(Outstanding loan 5) – 0.2820(No of child 1) – 0.2004(No of child 2) + 0.2295(No of child 3) – 1.1474(No of loan 1-4) – 0.0744(No of loan 5-8) – 0.4237(Chinese) + 0.3661(Indian).

Based on the above result, the following is the discussion on the results of significant categories. The significant categories were those categories with p-values less than 0.05 (Table 1 and Table 2). In terms of age, both logistic regression models found that the age category that was more likely to be bankrupt was between 40 to 49 years as compared to 60 years and above. The finding on the age category between 40 to 49 years was the more likely to bankrupt fell within part of the range of age group of bankrupts (35 to 44) as reported by the Malaysia Department of Insolvency (2017-2023) and Hospodka (2015). They reported that the highest percentage of bankruptcies and the most vulnerable age group is between 35 to 44 years old. This model further identified that borrowers aged between 50 to 59 years old were less likely to be bankrupt as compared to borrowers aged between 60 and above.

Both logistic regression models found that the male category was more likely to be bankrupt compared to the female category. This finding is similar to Othman et al. (2015), Eaw et al. (2014, 2015), and Jullamon (2012) where they indicated that the majority of bankrupts are male. Malaysia Department of Insolvency also reported that the highest percentage of bankrupt is male (Malaysia Department of Insolvency, 2017-2023).
For employment status, the researcher found that borrowers who were attached to the public sector were less likely to be bankrupt compared to unemployed borrowers. This finding is similar to both Desai (2016) and Zhu (2011) who pointed out that the percentage of bankruptcy filing probability is higher for the unemployed filers compared to the employed filers. On the other hand, self-employed borrowers were 1.6 times more likely to be bankrupt as compared to unemployed borrowers. According to the Malaysia Department of Insolvency, self-employed are among the employment statuses declared by the bankrupts (Malaysia Department of Insolvency, 2017- 2023)

Hospodka et al. (2015) found that a higher percentage of lower-income debtors file for bankruptcy compared to higher-income debtors. Meanwhile, Agarwal et al. (2011) showed that a 1% increase in income could lead to a decrease of 20% in bankruptcy filing. In terms of income, the results showed that borrowers who earned RM1,000 and below were 1.7 times more likely to be bankrupt compared to borrowers who earned RM3k and above and borrowers who earned RM1,001-RM2,000 were slightly more likely to be bankrupt as compared to borrowers who earned RM3k and above. These findings support Hospodka (2015) and Agarwal et al. (2011) and it is an extension to the literature where the results indicated the specific range of income of bankrupt.

As for expenses, the results indicated that borrowers who spent between RM2001 and RM3000 were more likely to be bankrupt. This finding also furthers the literature as the result showed the exact range of expenses that the borrowers spent every month. Whereas, Zhu (2011), Agarwal et al. (2011), Azaizeh (2010), and Rhee (2001) only indicated that high expenses increase the likelihood of bankruptcy filing.

The outcome of the outstanding loan category showed that borrowers with outstanding loans of more than RM150k (high outstanding balance) were most likely to be bankrupt. This is similar to the findings of Hospodka et al. (2015), Dawsey (2014), Gross and Souleles (2002), and Stavins (2000) which indicated that households who had filed for bankruptcy carried high loan balances. The logistic regression models also found that borrowers with outstanding loans between RM90,000 to RM119,999 were 1.6 times more likely to be bankrupt as compared to borrowers with outstanding loans of more than RM150k.

The results indicated that married and divorce were an insignificant category and single borrowers were less likely to be bankrupt compared to borrowers who were widows. This finding supports the results found by Jullamon (2012) who indicated that 8.6% of the total respondents who filed for bankruptcy were widows. According to Zhu (2011), borrowers file for bankruptcy soon after the divorce or death of a spouse because of household income issues. Divorce or the death of a spouse puts household members into a difficult situation because they do not have much earning power or well-established credit. As a result, borrowers could file for bankruptcy after getting divorced or being a widow.

Borrowers with no child or 1 to 3 children were less likely to be bankrupt compared to those with 7 children and above. The finding above is consistent with Creswell (2014) who found that borrowers with larger families had a higher probability of bankruptcy. Zhu (2011) also found that the more children the borrowers have, the higher the probability of bankruptcy filing. In addition, the results also found that borrowers who had 4 to 6 children were slightly more likely to be bankrupt as compared to borrowers with 7 children and above. In terms of number of loans, borrowers who had 1 to 4 loans were less likely to be bankrupt as compared to borrowers with 9 loans and above. This result supports Desai (2016) and Dawsey (2014) who pointed out that the higher the number of loans, the more likely the borrowers file for bankruptcy.

Lastly, for the race category, borrowers who were Chinese were less likely to be bankrupt as compared to Malays. This is similar to the report from the Malaysia Department of Insolvency in 2009 and 2013 where they found that the Malay race is the majority of bankrupts in Malaysia (Malaysia Department of Insolvency, 2010, 2014). From 2014 onwards, the Malaysia Department of Insolvency does not report on the race category which the researcher believes is due to the issue of racial sensitivity. For Indian borrowers, they were 1.4 times more likely to be bankrupt as compared to Malay borrowers. One likely reason for this outcome could be that Indian households are earning low income as compared to Malay households. This result is in line with Khalid (2011) who found that the Indian has the least ownership in wealth where 23.7% of them did not have wealth compared to 14.7% of the Bumiputera and 10.5% of the Chinese.

In addition, the predictive performance of the logistic regression model can be evaluated by using performance measure which consists of misclassification, accuracy, sensitivity, and specificity rate. Misclassification is the probability that the model has wrongly predicted bankrupt as non-bankrupt and non-bankrupt as bankrupt. Accuracy means the probability of the model correctly predicted bankrupt and non-bankrupt. Sensitivity is the probability that the model can correctly predict bankruptcy and specificity means the probability that the model can correctly predict non-bankrupt. A good model consists of a lower misclassification rate and higher accuracy and sensitivity rate (Akosa, 2017; Brown, 2014).

Table 6 displays the performance measure results. The results showed that the validation classification accuracy and specificity for imbalanced datasets are 83.17% and 8.38% respectively. The specificity rate is low, less than 10% and the sensitivity rate is 98.49% (high rate, almost perfect) which indicates that the personal bankruptcy prediction model was affected by the imbalanced data. Then, undersampling was performed by randomly selecting 4,174 cases from the 20,372 terminated cases and re-evaluating the model using the balanced sample of 8,348 cases. The validation classification accuracy decreased slightly to 71.144% but the sensitivity rate increased to 78.43%.

Table 6: Performance Measure Results (Accuracy, Precision, Specificity and Sensitivity)

		Imbalanced data (n=24546)		Balanced data (n=8348)	
Model		**Training (%)**	**Validation (%)**	**Training (%)**	**Validation (%)**
Logistic Regression	Accuracy	83.35	83.17	71.71	71.14
	Misclassification	16.64	16.82	28.29	28.86
model	Specificity	9.75	8.38	78.16	78.43
	Sensitivity	98.43	98.49	65.25	63.84

5. Managerial Implications and Recommendations

This paper presents some important ideas to policy maker or managerial level of commercial banks and credit companies based on the statistical analysis results. They should give more attention to borrowers with the following characteristics: male, aged between 30-39 years old, Malay, married, number of children between 1 – 3 children, work in the private sector, monthly household income RM3,000 and above, monthly household expenses between RM1,001-RM2,000, number of loans between 1- 4, outstanding loan RM30,000 and above, never experience adversities and live in the city. This is because policymakers at or managerial level can develop strategies that can help to reduce defaulters. The fewer the defaulters, the lesser will be the bankrupts. Furthermore, wrong credit assessment leads to an increase in the number of defaulters and as a sequence could drive financial institutions toward bankruptcy (Kambal et al., 2013). In addition, policymakers maker or managerial levels can also develop strategies which meet the organisation requirements and potential borrowers' needs. The strategies include providing short financial management courses to potential loan applicants or borrowers, educating on personal bankruptcy impact through a personal bankruptcy awareness campaign, tightening loan application procedures, offering low loan amounts, shorter loan periods, and regular follow-up on default accounts.

Conclusion: This paper discussed the improvements in the prediction of personal bankruptcy using random undersampling to correct the imbalanced data. The application of the logistic regression technique in this study showed that the specificity rate increased after the random undersampling strategy was applied. In conclusion, the predictive performance of the personal bankruptcy model based on the balanced dataset is more reasonable compared to the imbalanced dataset. According to Yap et al. (2011), in practical applications, classification methods that are easy to understand such as decision trees and scorecards are more appealing to users (Yap et al.,2011). For future research, the researcher intends to consider a Decision Tree, Scorecard, Support Vector Machine and Naïve Bayes model.

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AI Revolution: How Malaysian Firms are Redefining Accounting Performance

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Abstract: Artificial Intelligence (AI) is the primary force behind the organization's continued sustainability and competitiveness. The rise of AI software, cloud computing-based software and blockchain apps and services, together with the use of accounting information outcomes indicate that computerized accounting has become available to accountants. Even if there are great hopes for the application of AI in the accounting industry, numerous nations with little infrastructure are still lagging in using this type of technology. 88.89% of the 80 questionnaires that were initially issued were returned within a week. As a result, of the 80 questionnaires issued, 75 responses were received in one week, yielding a response return rate of 93.75 percent. Managerial and non-managerial staff members from American Express (Malaysia) Sdn. Bhd, Selangor, Malaysia were chosen as research participants. By employing a sample random sampling approach, a total of 75 legitimate surveys were gathered. The results of the study have shown a positive strong relationship between the level of readiness (AI Software, Cloud technology and Blockchain) and level of adoption (AI Software, Cloud technology and Blockchain) in the accounting industry toward employees' job efficiency. All eight hypotheses (H1 to H8) showed a significant relationship and were all accepted. The outcome of the moderating effect between working tenure and level of readiness presents a direct impact. However, the level of adoption shows an indirect impact on job efficiency whereas job efficiency shows a direct impact.

Keywords: *AI Software, Cloud Technology, Blockchain, Accounting Field, Malaysia*

1. Introduction

The technological age's Industrial Revolution (IR) 4.0 is being sparked by artificial intelligence (AI). It enables computers to carry out activities that resemble those of humans, acquire knowledge from mistakes, and adapt to new data. These innovations enable the processing of massive volumes of data, improving the recognition of similarities within the data (Miller, 2019). Large amounts of data may significantly boost the efficiency of an organization and technological advances allow for the skillful application of statistical analysis. To be durable in this rapidly evolving and highly competitive marketplace, every company entity needs to have a competitive advantage (Frisk and Bannister, 2017). Artificial intelligence (AI) is developing at an astounding rate, and this trend doesn't appear to be going down. According to Stancheva-Todorova (2018), deep machine learning and massive data science are two areas where advancements in AI are being driven.

AI is the primary force behind the organization's continued sustainability and competitiveness (Omar, Hasbolah, & Ulfah, 2017). Since AI is widely recognized for its benefits in terms of decreased costs, time savings, and enhanced productivity (Pavaloiu, 2018). Organizations must integrate AI technology within the way they operate in the fast-paced commercial world of today to remain viable. To further enable them to make better-informed decisions regarding their clients' financial affairs, accountants will also need to be proficient in both technological skills and business knowledge when they examine information collected from emerging sources like email messages, receipts, and social networking posts (ICAEW Volunteers, 2023). AI presents several difficulties in the accounting sector in addition to its possible benefits.

The job efficiency of accounting, accounting technological advances, changes in system administration, and the need for data gathering and analyzing of all these areas have been significantly impacted by this shift to computerized accounting. The rise of AI software, cloud computing-based software and blockchain apps and services, together with the use of accounting information outcomes indicate that computerized accounting has become available to accountants.

The function of computerized accounting shifts from that of traditional accounting to researchers in producing financial data or information for analysis. This allows accounting to establish skill accelerators and comprehend emerging technologies in the context of Society 5.0. For the accounting industry, digital accountant 5.0 has several noteworthy benefits.

The potential loss of jobs because of AI mechanization replacing much of the monotonous work currently done by accountants constitutes one of their primary concerns. According to their analysis, there is a clear developing pattern in the application of AI in accountancy. AI can be applied in a variety of accounting contexts, including taxation, bookkeeping, auditing, financial institutions, and trade in securities. In the traditional sense, all these procedures are laborious and time-consuming. But by giving such tedious jobs to machine learning, accountants may free up their valuable time to work on more complicated issues that need critical thinking. One way to lessen the drawbacks of conventional systems for accounting is to combine artificial intelligence (AI) with accountancy information (Jeneesh, 2017).

The work of handling payables from accounts (AP) and receivables from clients can be significantly simplified and optimized by incorporating based on artificial intelligence accounting applications into managerial responsibilities. An organization's strong connection with vendors will be supported by effective account payables administration. Additionally, it will fortify financial information and enhance corporate processes in preparation for future growth (Nwakaego & Ikechukwu, 2015). In the current age of rapid technological change, receiving APs in the old-fashioned way is not as appropriate. One of the ostensible advantages of shifting from traditional to digital ways is that organizations may do away with the problem of misplaced documentation and improve operational efficiency by conserving resources like paper, energy, and space. Additionally, it is now possible to complete payments to suppliers on schedule, which helps to improve credit scores (Deloitte, 2015).

By understanding how AI impacts accounting performance, it can help organizations to make better-informed decisions about technology investments. Hence, it can lead to a more effective allocation of resources, improved financial forecasting, and enhanced overall business strategy. It can also automate routine accounting tasks, minimize errors, and enhance data accuracy. Organizations can then leverage these insights to improve the financial reports and enhance overall business strategy. By adopting AI solutions that improve accounting functions, organizations can differentiate themselves in the market, offering more accurate and timely financial information to stakeholders. Enhanced AI capabilities can improve the audit trail and reporting processes, making it easier for organizations to provide transparent and verifiable financial information to regulators and auditors. The study can identify the best practices in AI implementation that enhance accounting performance. Malaysian organizations can use these insights to benchmark their processes against industry standards and gain a competitive edge. In short, this study has significant practical implications for Malaysian organizations by providing actionable insights into how AI can be effectively integrated into accounting practices to enhance performance, efficiency, and strategic decision-making.

Nowadays, there is a worldwide fear about the incorporation of intelligent machines (AI). Records indicate that the use of AI in accounting dates back more than 25 years, and its primary applications are in the fields of accounting auditing and reporting (Chukwudi et al., 2018). Malaysia has very little experience with AI adoption. The results of a poll that the Malaysian Institute of Accountants (MIA) carried out around July and September 2017 provide evidence. The results showed that, in comparison to other technologies like Microsoft apps, accounting software, cloud apps, fintech, instruments for data analysis, and so forth, the adoption as well as use percentage for AI was just 13% at this point. While global studies on AI in accounting exist, there is a scarcity of research focusing specifically on

Malaysian organizations. AI technology is evolving quickly, and organizations are continually adapting to these changes. Hence, there is a need to understand how these advancements are being integrated into Malaysian accounting practices and how they affect performance, efficiency and accuracy. Malaysian accounting standards and regulatory requirements differ from those in other regions. Investigating how AI influences compliance and reporting in the Malaysian context can provide valuable insights into managing AI-driven transformations while adhering to local regulations. This study aims to address this disparity by examining the potential effects of artificial intelligence deployment on Malaysia's financial sector. The research objectives are

stipulated as follows:

- To investigate the effect of readiness and adoption level of using AI software applications in the accounting field for job efficiency.
- To investigate the effect of readiness and adoption level of using cloud technology in the accounting field for job efficiency.
- To investigate the effect of readiness and adoption level of using blockchain in the accounting field for job efficiency.

2. Literature Review

Artificial intelligence (AI) has several advantages for businesses, but Malaysia is still in the early stages of using AI (Omar et al., 2017). With 24.6% of its organizations investing in AI technology, Indonesia led among ASEAN nations in the use of AI, according to data released by the International Data Corporation, or IDC, in 2018. Malaysia was substantially behind at 8.1%, in comparison. This demonstrates the limited use of AI by Malaysian enterprises. The Malaysian Institute of Accountants (MIA) performed a poll during July and September 2017 that yielded the following results. The results showed that in comparison with competing innovations like Microsoft apps, accounting programs, cloud apps, financial technologies, and tools for data analytics, the use and acceptance percentage of AI was barely 13% at the time. Nonetheless, it is anticipated that in three years, the use of AI will increase to 15% (MIA, 2019). Given how few applications of AI there are, a lot of Malaysian industries may be unaware of the tool's much greater capability. Given that AI is regarded as one of the forces behind IR 4.0, this issue has caused great anxiety.

The period of Culture 5.0, which has been influenced by different technologies involving big data, data privacy, AI software, computing in the cloud, and blockchain, has made significant changes to the field of accounting. Internet accounting is one of these changes, and it will help professionals in accounting fulfill their mission. The accounting profession needs to adapt to the changing circumstances and be innovative in the context of Society 5.0. To increase job efficiency and productivity, accounting companies must also comprehend technology and utilize it to its fullest potential. In this situation, auditors can provide correct information instantly by utilizing technologies like massive amounts of data, artificial intelligence (AI) software, computing on the cloud, blockchain, and cyber security.

Artificial Intelligence (AI) in accountancy has been the subject of numerous studies. For example, Guo, Shi, and Tu (2016) studied the application of AI to analyze texts to analyze uncontrolled financial and accountancy data. The researchers discovered that when it came to discovering trends in data, neural networks outperformed other forms of data mining. Chukwudi et. al. (2018) determined the AI in accounting procedures in Southeast Nigeria. Efficiency of the procedure for auditing and systems for expertise were found to be positively correlated.

This research concentrated on the reporting of earnings and auditing, even though they offer certain insights regarding the application of AI in accounting. The investigations likewise addressed how AI is affecting finance, but they did so using quantitative data, which carries the danger of bias and obscures the true nature of the issue.

Relationship Between the Readiness Level of AI Software Applications in the Accounting Field.
Throughout the past several decades, there has been a significant evolution in the corporate sector. As technology advances, there will be more instability and shifts in industries in the upcoming decade. Advances in technology coupled with the significance of conducting skills like expert judgment, mental agility, and constitutional and moral actions will present both benefits and challenges for a lot of users, both new and old. Most of the innovations are now goods or means of distributing assets and there is little distinction among them (Blut & Wang, 2020). Latest developments in technology have brought about drastic changes to the consumer and company paradigms that currently prevail. Drones, AI, big data, Blockchain, Fintech, cloud computing, smartphone apps, and cryptocurrency are just a few examples of the technologies that significantly impact company procedures.

According to Parasuraman (2000), readiness for technology is the ability of individuals to accept and utilize new technologies in their professional and private lives as well. It represents a complex interplay between psychological triggers and restraints that influence an individual's propensity for embracing new technologies (Parasuraman & Colby, 2015). Graduated accounting professionals need to be open to integrating emerging technologies to be prepared for future employment in the accounting sector, as improvements in technology are affecting the field. The speed at which a company gets done and its effectiveness have grown dramatically because of the effect that technology has on activities. Thanks to technological improvements, accountants can become more efficient than they have ever been (Zhang, Dai, & Vasarhelyi, 2018).

The predicted shifts brought about by technological improvement in their prospective job are something that graduate accountants are unable to prevent. For student accountants to perform at the highest level, they require greater familiarity with technology (Tan & Veal, 2005). The key motivator for them to stay up to date with the developments is the progress of technology, which is a primary force behind worldwide transformation. Accounting candidates and subsequent accounting professionals who will uphold the legitimacy and applicability of expert assistance in the age of the Internet both find this to be of comparable importance. Research regarding how personality traits affect technological readiness is needed as new technologies progress (Blut & Wang, 2020).

Relationship Between the Readiness Level of Cloud Technology in the Accounting Field.

Cloud computing services are usually categorized into three categories: the software as an offering (where users access software programs supplied by external cloud-based service suppliers) and structures as a service (where users control both infrastructure and applications) (Gangwar et al., 2015; Low et al., 2011). According to Mill and Grance (2011), clouds might be accessible for the publicly traded, community-accessible, restricted to an organization, or an intersection of these. Given the anticipated move away from internal processes, cloud-based computing was previously seen as an innovation in the accounting sector (Hsu and Lin, 2016; Ma et al., 2021). The economic value of cloud computing derives from its versatility, expansion, and ease of obtaining updated data for various individuals at multiple places. It also reduces the necessity for archived information and backups (CPA Australia, 2019; Fawcett, 2015). Cloud computing offers small and medium-sized companies (SMEs) more chances to utilize the latest innovations, enhanced flexibility in building up computer resources, and less expenditures on capital, development costs, and maintenance expenses (Hsu and Lin, 2016; Ma et al., 2021). Whilst some businesses are dubious concerning the safety elements of employing cloud computing, it might improve both interior and exterior partnerships and allow for easy accounting and spread of accounting data for successful business choices (Dimitriu and Matei, 2015, Tarmidi et al., 2014).

Relationship Between the Readiness Level of Blockchain in the Accounting Field.

Determining how accounting professionals are ready to embrace the application of blockchain technology is the motivation behind this investigation. Therefore, the purpose of the research is to assess accounting professionals' readiness according to Parasuraman's (2000) technological readiness rating and the way that readiness affects their decision to use blockchain technology. Based on theory, this study uses TRI to enhance our empirical knowledge of how prepared accounting professionals are for disruptive technologies. In particular, the current study provides statistical evidence for Malaysian accounting professionals' behavioral desire to use blockchain technology.

Pragmatically speaking, the results of the study will assist those who are interested, particularly the Blockchain Malaysia Association, the power source Malaysian Institute of Accountants (MIA), a MIGHT, and other officials or legislators in developing suitable and feasible tactics for motivating and enabling Malaysian organizations in effectively employing blockchain technology for the foreseeable company helps and to provide that blockchain applications will continue to be well-received by Malaysian accounting researchers. A summary of the several issues that need to be resolved before blockchain technology is widely applied, which might have a big influence on global trade, brings this study to a close.

Only the accounting professions' readiness for blockchain technology by 2019 is the primary concern of this study. The term "accounting professionals" describes the specific individuals working in Malaysia in accountancy-related fields. The cross-sectional design may yield outcomes that vary from continuous studies or data undertaken in other nations owing to differences in time, culture, and professional procedures. The

present research is centered on the participants' technological readiness and pre-adoption viewpoint because blockchain technology is nevertheless in its nascent stages. As a result, several inescapable external factors could influence the research's results, and the investigator was unable to restrict the external factors that the study involved.

Therefore, according to Parasuraman (2000), it's important to ascertain customers' readiness to employ technology-based procedures to ascertain their propensity for using new technology. Technology readiness was defined by Parasuraman (2000) as a person's propensity to understand and use new technology to achieve their targets at the job and home. A 5-demonstrate multiple-item rating was developed by Parasuraman (2000) to gauge users' readiness to accept new technologies.

Relationship Between the Adoption Level of AI Software Applications in the Accounting Field.
Additional research regarding the way accounting accepts and utilizes AI has been suggested for the data systems and accounting study fields (Issa et al., 2016; Sutton, Holt, & Arnold, 2016). For a deeper comprehension of the usage of AI in accounting, this research project looks at how accounting companies have implemented, enabled by artificial intelligence inspection technologies. The research investigation looks at how AI functions in the traits of accounting organizations and the outside world (Rogers, 1995; Tornatzky, Fleischer, & Chakrabarti, 1990).

Studies found that the notion of artificial intelligence is always changing and that it is occasionally easy to distinguish AI from other intelligent technologies (Collins, Dennehy, Conboy, & Mikalef, 2021). AI was initially defined as "the technological method of creating intelligent machines" in 1956 (McCarthy, 1960). However, investigators later adopted several AI concepts. According to Collins et al. (2021) and Wolfe (1991), artificial intelligence (AI) can be categorized into two types: rule-based AI, which follows predefined rules, and regulations AI, which does not follow established standards. Borges, Laurindo, Spínola, Gonçalves, and Mattos (2021) conducted a comparative analysis of applications utilizing artificial intelligence that varied in their reliance on human rulemaking and attribute definition to illustrate an issue. Deep learning, visual learning, machine learning, and artificial intelligence are all included in this paradigm.

According to Collins et al. (2021), the areas of machine learning, computer vision, processing of natural language, intelligent systems, and automation are some of the most frequently debated forms of AI technology among academics in the IS fields. This investigation considers the latest developments in the AI spectrum through a wide lens, rather than concentrating on any one of those groups in particular. Sutton et al. (2016) have informed the public that concentrating on certain AI frameworks while ignoring others may result in prejudiced study findings. As a result, the concept of "AI" as it is employed in the present dissertation refers to a broad range of information-based systems like expertise systems and decision-support infrastructure, and also machine learning (both supervised and unsupervised) techniques like artificial neural networks and learning with associations.

Relationship Between the Adoption Level of Cloud Technology in the Accounting Field.
This investigation is mostly motivated by the accounting field's apparent adoption of cloud computing to an extent that has significantly surpassed other industries. Research on the adoption of cloud computing that is now available likewise falls short in this area. Some of the material currently available on cloud computing is

Concentrated on the scientific, supply-side cloud computing concerns (what exactly is the most effective method for creating and disseminating content Computing capabilities that satisfy customers' requirements?), as opposed to the demand-side (why would individuals and companies use cloud computing?). The cloud computing research from the client side additionally differs greatly regarding the contextual elements. These elements, including the nation and industry, typically have a significant impact on how companies run their business activities and attain their objectives.

Furthermore, no specific connection is made between the adoption behavior and the organization's operational circumstances, tactics, or procedures in the adoption research. The purpose of this preliminary research is to investigate the demand-side characteristics of cloud computing. Computational methods inside the accounting sector. A design involving several case studies is employed. Accounting organizations (firm-level) are the basis

of examination, with a focus on minor bookkeeping companies. Discussions with the subjects are organized into phases to collect data. Individuals from six distinct accounting companies. The investigation is centered on the choice creators' perspectives on the emerging cloud issue and the causes for their choice to accept or deny the use of cloud computing.

Small firms may now adopt state-of-the-art computer systems, reap the rewards, and improve them since cloud computing eliminates the need for early expenditure. Sufficiently advanced computer systems to rival their bigger competitors (Marston and others, 2011). According to earlier research on cloud computing adoption, reduced expenses, flexibility, and convenience of access are the main reasons why companies have adopted cloud computing. However, the biggest challenges to using cloud computing are worries about the confidentiality and integrity of cloud computing.

Relationship Between the Adoption Level of Blockchain in the Accounting Field.
Blockchain's approach to operating. Analysts anticipate benefits from the adoption of blockchain in the process, including dedication, convertible status, certainty, and enthusiasm to push the technology forward in the retail sector. As an administrative strategy for the management of Blockchain, the adoption of Blockchain requires an intense commitment (Rusbult and Van Lange, 2003). Engaging in interpersonal engagement elicits a physical reaction and enhances habit formation and sustained engagement (Agnew, Van Lange, Rusbult, and Langston, 1998, for example). Kind ideas are the source of beneficial alterations (Rusbult and Van Lange, 2003). The partners' increasing dedication to each other highlights pro-social behaviors like reconciliation, housing, and helping sufferers (e.g., Finkel, Rusbul, Kumashiro and Hannon, 2002, Rusbult, Verette, Whitney, Slovik, Lipkus 1991, Van Lange Harinck, Steemers, 1997).

As a result, fulfillment plays a crucial role in the method of building relationships. To adhere to this procedure, blockchain adaptation involving blockchain with the accounting sector was specifically included in the present investigation's strategy. According to Rusbult and Van Lange (2003), knowledge of the "demand" or "dependency" of upcoming parties is essential to comprehending the adaptability and engagement that constitute this concept." The interrelationship in satisfaction or discomfort that results from addiction, which decides whether to maintain or leave an affiliation, is connected to Blockchain adaptability. Consumption is also associated with fragility since it exacerbates incompatibility and unilateral dominance. When there are competing goals that are not inverse, the more contentious partner will act for their own greatest good or that of their partner, provided that all partners are aware of each other's ability to respond. Even though relationships can carry through a violent one, it is believed that the companion is trustworthy if he reacts beneficially and does not abuse his enticing situation. This is either a poor substitute or an expensive gamble (Johnson, 1995, Rusbult & Martz, 1995). The beneficial blockchain knowledge, blockchain oversight, and blockchain management plan encourage blockchain's flexibility, zeal, and dedication, which in turn propels its blockchain-based accounting sector.

Mediating variable effect between job efficiency towards the relationship of level of readiness of using technologies in the accounting field.
Employee Development and Learning: Using AI in accounting and auditing calls for a staff equipped with the know-how to handle and operate these tools. Knowing the state of technological readiness makes it easier to create training programs that function and build a workforce that can implement and utilize AI solutions. Cost Efficiency and Resource Optimization: Technology readiness analysis helps determine how much money

And resources will be needed when adopting AI. Finding integration-ready technologies can help with distributing assets and implementation techniques that are less expensive (Duong and Vu 2023; Firoiu et al. 2023a).

Innovation Potential: Researching the connection between the acceptance of artificial intelligence and technological preparedness provides opportunities for novel approaches to accounting and auditing procedures. It offers perceptions of how cutting-edge technology may be used to fundamentally alter the industry and promote an innovative culture. In conclusion, it is critical to investigate the relationship between technological readiness and acceptance of artificial intelligence in the context of Vietnam's accounting and auditing to stay abreast of international developments, maintain regulatory compliance, enhance operational

effectiveness, and capitalize on AI's potential to spur innovation in the financial services industry. In the end, it helps the nation's accounting and auditing industry expand and become more competitive by offering an approach for the tactical application of AI technologies (Firoiu et al., 2023b).

The reduction of future expenses is another important advantage of integrating artificial intelligence (AI) within a business's accounting function. Long-term dependence on computer programs (AI) will decrease the need for human operations while enhancing both the efficiency and accuracy of accounting records from businesses.

Mediating variable effect between job efficiency towards the relationship of level of adoption of using technologies in the accounting field.

By analyzing and deciphering the vast amount of accounting information, the majority of which originates from non-traditional systems of accounting, accounting experts today around the globe offer important assistance to their upper management (Spiegel & Dilsizian, 2013; Haverson, 2014; Davenport & Harris, 2017). Financial and non-financial data is extracted from web server logs, Internet and smartphone clickstream audio Qiles, social networks, and a plethora of machine-generated as well as sensor-detected systems. The resulting data is then analyzed and interpreted to help make essential company choices (Bertolucci, 2023; LöfQler, 2013).

Additionally, as a crucial component of management processes, several governments globally have taken action to enhance third-party accessibility to data obtained from citizens and businesses as well as internal government data, which will expand the opportunities for statistical analysis (Casselman, 2015; Office of Management and Budget, 2015). Additionally, businesses can increase their efficiency and gain insightful data about their clients and employees to create more competitive personnel and customer strategies by utilizing artificial intelligence (AI) technologies, such as artificial intelligence (AI), natural language processing, recognition of words, and machine learning (Ernst & Young, 2020).

Professionals in accounting are becoming increasingly involved in the strategic use of artificial intelligence (AI) technologies. With the introduction of large amounts of data, data statistical analysis, and the use of artificial intelligence (AI), experts in accounting have proven they can provide more value to companies by increasing revenue and optimizing workflows. In the age of artificial intelligence, increasingly complex duties will be delegated to accounting software by traditional accounting staff, significantly enhancing efficiency, lowering the rate of error, and boosting company and industry competitiveness in the marketplace. This will also help to foster the evolution of the accounting sector.

The job responsibilities of accounting personnel typically vary by the company's operational process. However, in the context of artificial intelligence, AI will replace traditional accounting as well as auditing work, greatly increasing job efficiency, and altering the way that traditional accounting and auditor duties are separated. This will assist accounting personnel with enhancing the caliber and ability of their job duties. This will alter the conventional financial and operational working modes in addition to optimizing the structure layout and accounting post settings.

3. Research Methodology

Measures

The questionnaires were divided into five sections, each consisting of closed-ended statements. Section A; the respondents' demographic data, Section B; Level of readiness and adoption of using AI software; Section C: Level of readiness and adoption of using Cloud Technology; Section D: Level of readiness and adoption using Blockchain; Section E: AI usage in the accounting Field and Section F: Job Efficiency. The notion of adapting and adopting was employed from several sources, including Spector (1997), Mohammad et al. (2020), Ahmed (2020), and Kanapathipilla et al. (2020) for this work. Sections A, B, C, D, E and F of the survey were broken down as follows: The initial measurements from Zhang et. al. (2019) have undergone several adjustments to suit the current study's setting. Five-point Likert scale, with one denoting "strongly disagree" and Qive denoting "strongly agree," was used to rate the items.

Google Forms was the tool utilized to submit the survey to the responders. Each participant received a link to

the questionnaires via WhatsApp and email. It made clear the one-week timeframe that was assigned to the responders and guaranteed the privacy of their answers. According to Watt et al. (2018), 32.6% is the proper limit for a reply rate by % for online surveys.

Data Collection

For this study, a straightforward random selection seems to be the most appropriate sample strategy (Salkind, 2019). Eighty of the ninety managerial and non-managerial staff members from American Express, Selangor, Malaysia had their names drawn at random from an assortment using the chance method (Packham, 2015). An arbitrary number ranging from one and 90 was assigned to every one of the 90 employees; the remaining 80 were allocated to them. The members of the biggest group's subgroup were chosen at random, giving every member of the vast population a comparable likelihood of being chosen. Packham (2015) stated that this process resulted in, for the most part, an evenly distributed subset with a large prospective group that was usually devoid of discrimination.

A total of 80 questionnaires were distributed, with consideration paid to the sustainability of responses and the rate of return of respondents. A response return rate of 93.75% was obtained from the 75 questionnaires that were returned with complete responses.

Data Analysis

The Statistical Package for Social Sciences (SPSS), Version 27, is used for processing and interpreting the information contained in a data analysis matrix. Descriptive statistics, as well as inferential statistics, are both (2) categories of statistical techniques used. According to Watt et al. (2018), descriptive statistical techniques are used to characterize the basic choices of how to collect and evaluate data. As an illustration, descriptive statistics examine the study participants' demographic profile, taking note of the rate and percentage of responses.

Inferential statistics addresses the research questions and hypotheses (Said, 2018). Inferential statistics help in identifying and quantifying relationships between the variables of investigation, that is, the relationship between the degree of readiness and adoption of implementing AI software, Cloud technological advances, blockchain, and AI usage in the accounting industry.

Results

This section presents sets of results relating to the profile of respondents' experiences towards effects of AI on Accounting Performance, the characteristics of the total sample, and the comparison of participants regarding their experience based on the demographic characteristics (gender, age, race, working tenure and position).

Respondents' Demographic Profile: Table 1 displays a summary of the characteristics of the total sample of respondents who participated in the study.

Table 1: Respondents' Demographic Profile: n = 75

Variable	Frequency	Percentage
GENDER		
Males	32	42.7%
Females	43	57.3%
Total	**75**	**100%**
AGE		
Below 25	18	24.0%
26 - 34	26	34.7%

35 - 44	22	29.3%
45 - 54	3	4.0%
Above 55	6	8.0%
Total	**75**	**100%**
RACE		
Malay	24	57.3%
Indian	23	32.0%
Chinese	28	37.3%
Others	0	0.0%
Total	**75**	**100%**
WORKING TENURE		
Below 5 Years	18	24.0%
6 - 10	33	44.0%
11 - 15	15	20.0%
Above 15 Years	9	12.0%
Total	**75**	**100%**
POSITION		
Junior Executive	20	26.7%
Executive	20	26.7%
Senior Executive	21	28.0%
Manager	14	18.7%
Total	**75**	**100%**

Descriptive Statistics: Descriptive statistics were conducted, and Table 2 below displays the outcome. These provide the average mean scores of the respondents regarding their opinion on the effects of AI on the level of readiness and level of adoption on accounting performance from the perspective of Malaysian organizations.

Table 2: Descriptive Statistics

Variables	N	Mean		Std. Deviation
	Statistic	Statistic	Std. Error	Statistic
LEVEL OF READINESS				
AI SOFTWARE	75	2.8347	0.12044	1.04306
CLOUD TECHNOLOGY	75	2.9627	0.13335	1.15487
BLOCKCHAIN	75	2.9644	0.12676	1.09780
LEVEL OF ADOPTION				
AI SOFTWARE	75	2.8507	0.13158	1.13951
CLOUD TECHNOLOGY	75	2.9947	0.12546	1.08651
BLOCKCHAIN	75	3.0381	0.12573	1.08881
JOB EFFICIENCY	75	2.9280	0.12636	1.09428
AI IN THE ACCOUNTING FIELD	75	3.0133	0.12916	1.11856

The mean scores ranging from 2.8347, 2.9627, and 2.9644 were obtained from the level of readiness (AI Software, Cloud Technology and Blockchain) while 2.8507, 2.9947, 3.0381, 2.9280 and 3.0133 were obtained from the level of adoption (AI Software, Cloud Technology, Blockchain, Job Efficiency and AI in Accounting Field). Every variable's standard deviation was determined to be above 0.70, indicating that all respondents agreed with the claims made for every factor (Pallant, 2016).

Correlation Analysis: The correlation study looks at how strongly the independent variables level of readiness and adoption (AI Software, Cloud Technology and Blockchain) mediate variable job efficiency to the dependent variable of AI in the accounting field. Two variables were compared, and a correlation coefficient was calculated, yielding values between -1 and +1. As per the findings of Ratnasari et al. (2016), Table 3 below illustrates the interpretation of r values: $r < -0.20$ for weak negative correlation, $r < -0.30$ for moderate negative correlation, $r < -0.50$ for strong negative correlation, and $r < -0.90$ for very strong negative correlation. There are four types of positive correlations: weak ($r < 0.20$), moderate ($0.30 < r < 0.50$), strong ($0.60 < r < 0.80$), and extremely strong ($0.90 < r < 1.00$).

Table 3: Correlation Analysis

No	Research Questions	Findings
Q1	Is there a relationship between the readiness and adoption level of Malaysian organizations for using AI software applications in the accounting field?	The finding for the level of readiness and adoption of using AI software indicates which is r= 0.670, p < 0.01 and r= 0.658, p< 0.01. There is a strong relationship between the level of readiness and the adoption of AI software in the accounting field.
Q2	Is there a relationship between the readiness and adoption level of Malaysian organizations for using cloud technology in the accounting field?	The finding for the level of readiness and adoption of using cloud technology indicates which is r= 0.681, p < 0.01 and r= 0.808, p < 0.01. There is a strong relationship between the level of readiness and the adoption of cloud technology in the accounting field.
Q3	Is there a relationship between the readiness and adoption level of Malaysian organizations for using blockchain in the accounting field?	The finding for the level of readiness and adoption of using blockchain indicates which is r= 0.716, p < 0.01 and r= 0.735, p < 0.01. There is a strong relationship between the level of readiness and the adoption of using blockchain in the accounting field.

Q4	Is there a significant effect of the mediating variable of job efficiency on the level of readiness in the accounting field?	The finding for the level of readiness and job efficiency indicates which is r= 0.776, p < 0.01. There is a strong relationship between the level of readiness and job efficiency in the accounting field.
Q5	Is there a significant effect of the mediating variable of job efficiency on the level of adoption in the accounting field?	The finding for the level of adoption and job efficiency indicates which is r= 0.776, p < 0.01. There is a strong relationship between the level of adoption and job efficiency in the accounting field.

Table 4: Regression Analysis of Level of Readiness (AI Software, Cloud Technology and Blockchain), Job Efficiency in the Accounting Field

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	Level of readiness	1.103	1.183		.933	.354
	AI Software	.114	.115	.108	.988	.327
	Cloud Technology	.150	.111	.158	1.348	.182
	Blockchain	.146	.112	.175	1.298	.199
	Job Efficiency	.472	.097	.483	4.882	<.001

a. Dependent Variable: AI in the accounting field

According to Jack (2019), any beta percentage of more than 10 percent indicates a direct influence on the moderating variable. The impact proportion between the variables is shown by a percentage greater than 10 percent (Landry et al., 2015). Table 4 indicates that for AI Software, there is a direct effect of 0.108 in the accounting field (DV) (B=.108, p=.327). This effect is noteworthy since 11 percent is greater than 10 percent. Since 16 percent is greater than 10 percent, cloud technology (B=.158, p=0.182) indicates that there is a direct influence toward DV by 0.158 as if there is a one-unit increase in cloud technology. This is significant. With a one-unit rise, Blockchain (B=.175, p=.199) shows a direct effect toward DV of 0.175 where it is significant since 18 percent is greater than 10 percent. The indirect impact of job efficiency (B=.483, p=<.001) on DV is shown to be 0.483 with a unit increase, although this effect is statistically significant.

Table 5: Regression Analysis of Level of Adoption (AI Software, Cloud Technology and Blockchain), Job Efficiency in the Accounting Field

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	Level of adoption	.350	1.058		.331	.742
	AI Software	-.087	.101	-.091	-.867	.389
	Cloud Technology	.468	.106	.465	4.417	<.001
	Blockchain	.188	.074	.261	2.532	.014
	Job Efficiency	.301	.095	.308	3.163	.002

a. Dependent Variable: AI in the accounting field

Any beta percentage greater than 10 percent, as defined by Jack (2019), suggests a direct impact on the variable that acts as a moderator. More than 10% of the percentage indicates the influence proportion among the variables (Landry et al., 2015). Table 5 shows that the accounting field (DV) has a direct influence of -0.091 for AI Software (B=-.091, p=.389). Since 9 percent is less than 10 percent, this effect is not significant. Cloud technology (B=.465, p=<.001) suggests that there is a direct effect toward DV by 0.465, as if there is a one-unit rise in cloud technology, as 47 percent is bigger than 10 percent. Blockchain (B=.261, p=.014) has a direct influence on DV of 0.261 with a one-unit increment; this effect is significant because 26% is higher than 10%. With one unit increase, the indirect impact of job efficiency (B=.308, p=.002) on DV is shown to be 0.308, while statistically not significant.

Table 6: Summary Findings for Hypotheses

No	Hypotheses of Study	Alternate Hypotheses
H1	The significant relationship between the readiness level of AI software applications in the accounting field.	Accepted
H2	The significant relationship between the readiness level of cloud technology in the accounting field.	Accepted
H3	The significant relationship between the readiness level of blockchain in accounting field.	Accepted
H4	The significant relationship between the adoption level of AI software applications in the accounting field.	Accepted
H5	The significant relationship between the adoption level of cloud technology in the accounting field.	Accepted
H6	The significant relationship between the adoption level of cloud Blockchain in the accounting field.	Accepted
H7	There is a significant mediating variable effect between job efficiency towards the relationship between the level of readiness to use technologies in the accounting field.	Accepted
H8	There is a significant mediating variable effect between job efficiency towards the relationship of level of adoption of using technologies in the accounting field.	Accepted

Discussion

The results of the study have shown a positive strong relationship between the level of readiness (AI Software, Cloud technology and Blockchain) and level of adoption (AI Software, Cloud technology and Blockchain) in the accounting field towards employees' job efficiency. All eight hypotheses (H1 to H8) showed a significant relationship and were all accepted. The outcome of the moderating effect between working tenure and level of readiness presents a direct impact. However, the level of adoption shows an indirect impact on job efficiency whereas job efficiency shows a direct impact.

5. Managerial Implications and Recommendations

Rules and incentives are paramount to the growth and success of the performance of the organization. Regarding the firms, it is advised that they utilize the study's conclusions as a guide to improve employee job efficiency. Giving out rewards is a good way to keep people motivated and loyal. To encourage job happiness at work, maintaining current practices involves staff participation and training. Meanwhile, it is also advisable to expand the research to include Sabah and Sarawak in east Malaysia as well as the Malaysian Peninsula to have a more dynamic and broad scope. These two states are home to a diverse range of ethnic groups, which may provide novel study findings and differing viewpoints. The study's expansion to further states will also produce

a broad understanding of Malaysia's overall development in the deployment of digital and electronic marketing.

Conclusion

The integration of artificial intelligence (AI) into accounting practices has notably transformed the landscape of financial management within Malaysian organizations. This study reveals several critical points regarding the impact of AI on accounting performance such as significantly improving the efficiency of the accounting process, reduction in operational costs and informed decision-making. Companies should prioritize providing more tools, such as AI Software, Cloud technology and Blockchain. To boost workers' job happiness, which will in turn raise their commitment, drive, and propensity for increased productivity inside the company. Greater profit returns will result from this, enabling the company to compete and set an example for other businesses. This will then draw the interest of other firms to enhance operations and a receptive attitude toward others learning about the strategies, which will ultimately benefit workers' and employers' businesses and provide the company with a competitive edge.

In conclusion, AI has profoundly impacted the performance of accounting functions within Malaysian organizations, driving efficiency, accuracy, and strategic decision-making while also presenting challenges that must be managed. The future of accounting will likely continue to evolve with AI advancements, necessitating a proactive approach to embracing technological change and harnessing its full potential. This highlights the main effects of AI on accounting performance while acknowledging both the advantages and challenges associated with its implementation.

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A Conceptual Framework of Navigating Digital Banking: How Gender Impacts Adoption Intentions in Klang Valley

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Abstract: Malaysian banking users have encountered negative experiences while adopting traditional bank services. Several customers and businesses face limited access to traditional banking products and services due to factors such as low or irregular income, bad credit, or a lack of conveniently located banks. The acceptability of digital banking products and services in Malaysia is currently unknown and inadequate due to the general lack of familiarity among Malaysians with the notion of digital banking. Conventional methods of analyzing consumer behavior, which primarily consider historical data and current resources, will not result in the achievement of branchless banking in the future. This paper presents a framework that examines how various factors such as performance expectancy, effort expectancy, social influence, facilitating condition, hedonic motivation, price value, and habit may influence behavioral intention. Additionally, the framework considers gender as a moderator variable. The results of this study are anticipated to expand the existing body of knowledge on behavioral intention and bring advantages to marketers and digital banking providers.

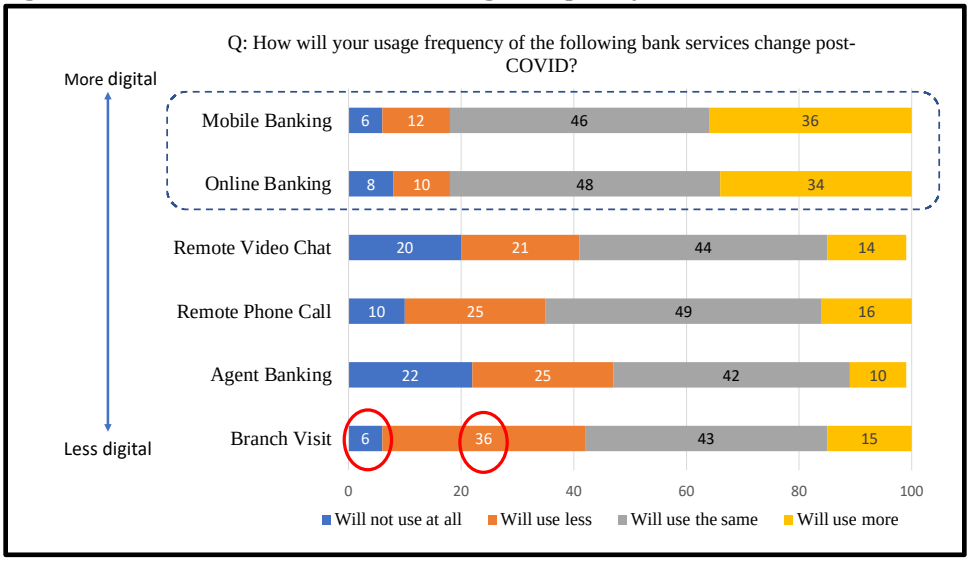
Keywords: *Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Condition, Hedonic Motivation, Price Value, Habit, Gender, UTAUT2*

1. Introduction and Background

The emergence of digital banking is revolutionizing the traditional banking operations and financial services that were previously limited to physical bank branches (Windasari et al., 2022). Every aspect of digital banking, including account opening, money transfers, and various financial services, may be conveniently carried out using smartphones without the necessity of physically visiting a bank branch (Riadi et al., 2023).

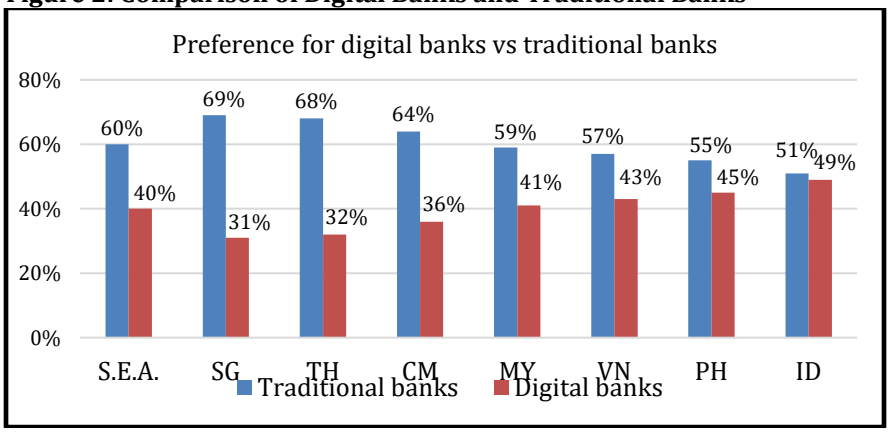
Survey done by McKinsey & Company (2021) Found that most Malaysians expect to continue or expand their use of mobile and online banking channels when the epidemic of Coronavirus disease 2019 (COVID-19) subsides, as shown in Figure 1. It suggests that 36 percent of respondents will visit their branch less often and 6% will never visit after the outbreak.

Figure 1: Post-COVID Bank Services Usage Frequency



Nevertheless, a significant majority of consumers (60%) still opt to maintain their primary banking accounts with traditional banks rather than digital banks as can be seen in Figure 2. Traditional banks possess well-established reputations and extensive histories, which can foster a feeling of confidence and safety. Several individuals may prefer traditional banks that they have been familiar with for a long time. Certain individuals place importance on personal interactions and the personalized assistance provided by traditional banks. They may have a preference for accessing a physical branch to seek assistance with intricate financial issues. As digital banks continue to expand and develop, these aspects may change. As people become more accustomed to technology and digital banking becomes more ingrained in daily life, the balance between traditional and digital banking preferences may shift.

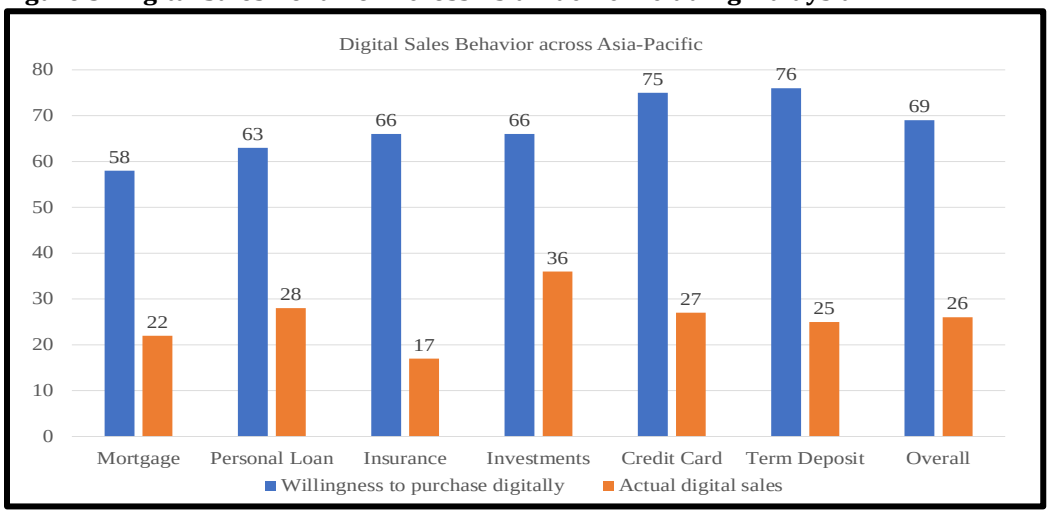
Figure 2: Comparison of Digital Banks and Traditional Banks



Source: Survey Consumer Payment Attitudes Study – VISA (2022)

A study conducted by Barquin et al. (2021) Revealed that despite customer interest in online banking products in Malaysia, banks have not successfully translated this desire into digital sales. The reason for this is that just 20 to 30 percent of the participants reported having purchased a financial product, such as a savings account, loan, or credit card, through a mobile app or online platform. Approximately 70% of respondents express a willingness to utilize digital channels for purposes other than commerce, as depicted in Figure 3.

Figure 3: Digital Sales Behavior Across Asia-Pacific including Malaysia



Source: McKinsey & Company (2021)

Several studies have been conducted in developing countries such as Pakistan (Khan, 2022), Bangladesh (Ashraf, 2022), India (Divya Meena et al., 2017), Vietnam (Nguyen & Dang, 2018; Nguyen et al., 2020), and Indonesia (Anggraeni et al., 2021; Rachmawati et al., 2019; Setiyono et al., 2019; Sintha, 2021) to investigate

the intention to adopt digital banking. Nevertheless, there is a scarcity of research investigating the determinants that impact consumers' intention to use digital banking, particularly within the Malaysian setting (Azmi et al., 2021; Suhaimi & Hassan, 2019; Tiong, 2020).

The introduction of digital banking services is anticipated to broaden and enhance financial inclusion, enabling individuals to access financial services without constraints of time and location. (Maulidya & Afifah, 2021). For digital banks to achieve success in Malaysia, they must possess a comprehensive understanding of the specific requirements of the target demographics they cater to. In addition, it is imperative for them to actively contribute to the advancement of financial literacy and financial inclusion throughout the entire nation (KPMG, 2020).

To promote a wider adoption of digital banking, it is crucial to identify the specific areas that require more focus in the implementation process. Gaining insight into the factors that drive customers to adopt digital banking can assist governments in promoting financial inclusion and empowering individuals to have greater control over their financial well-being, particularly in recovering from setbacks such as the COVID-19 outbreak. The purpose of this study is to analyze the UTAUT2 model of the behavioral intention of digital banking with gender as a moderator variable.

2. Literature Review

The Extended Unified Theory of Acceptance and Use of Technology (UTAUT2): Venkatesh et al. (2012) Created the Extended Unified Theory of Acceptance and Use of Technology (UTAUT2) to specifically examine how consumers perceive and utilize technology. This theory considers the acceptance of innovations for personal use and has been further explored by Alalwan et al. (2017), Baptista & Oliveira (2015), and Merhi et al. (2019). While UTAUT only accounts for 40% to 52% of the variation in customers' adoption of focal technology, UTAUT2 accounts for 56% to 74% of the variation in consumers' behavioral intentions. (Shankar et al., 2016; Venkatesh et al., 2012). Several researchers have acknowledged that the UTAUT2 is comprehensive and superior since it encompasses all the essential factors that predict the adoption of any technological innovation. (Tamilmani et al., 2021). Furthermore, the lack of the moderator variable which is age and experience does not damage the theoretical model when investigating the direct influence within the UTAUT2 model (Dwivedi, 2017).

Behavior Intention: Parkins et al. (2018) Defined behavioral intention as an individual's plan for the future. Research suggests that the decision to use technology is influenced by the behavioral intention to use it (Rizun & Strzelecki, 2020) and the adoption of a technology innovation is influenced by individual motivation (Turner et al., 2010). Prior studies conducted by several researchers (Parkins et al., 2018; Perri et al., 2020) have demonstrated that intention is the primary factor in determining the actual adoption of technology (Vairetti et al., 2019). Behavioral intention is well recognized as a crucial factor in determining the actual use and willingness to adopt new technologies (Ajzen, 1991; Venkatesh et al., 2003).

Performance Expectancy and the influence of gender as moderator variable: Performance expectancy, as defined by Davis et al. (1989) and Venkatesh et al. (2003), is a measure of consumer confidence that indicates the extent to which customers believe that using a specific platform will improve their performance. Wu and Ho (2022) Found that digital banking users believe that digital features can enhance problem-solving by providing rapid, convenient, and efficient solutions, thanks to their sophisticated technological attributes. A study conducted by Khan (2022) investigated the impact of behavioral intention and usage behavior on digital banking in Pakistan and Mainland China. Behavioral intention to adopt digital banking is influenced by performance expectancy both in Pakistan and China. As a result, it is hypothesized that:
H1: Performance expectancy positively influences banking consumers' behavioral intention to adopt digital banking.
H1a: The effect of performance expectancy on banking consumers' behavioral intention to adopt digital banking is moderated by gender.

Effort Expectancy and the influence of gender as a moderator variable: Effort expectancy is defined as the understanding that an individual can utilize information technology systems without any effort (Venkatesh &

Davis, 2000) and they are easy to use (Anggraeni et al., 2021). The study conducted by Windasari et al. (2022) centers around the examination of young consumers belonging to the demographic cohorts of Generation Y and Generation Z. The study was conducted in Indonesia due to the twofold increase in the utilization of digital banking within the past three years. The results indicated that consumers' willingness to embrace a digital-only bank is influenced positively by their perception of how easy it is to use digital-only banking services. Contrary to this, a study conducted by Merhi et al. (2019) found that effort expectancy does not have a major role for Lebanese participants, but it does have a mildly significant impact on English participants. Based on these analyses, it is hypothesized that:
H2: Effort expectancy positively influences banking consumers' behavioral intention to adopt digital banking.
H2a: The effect of effort expectancy on banking consumers' behavioral intention to adopt digital banking is moderated by gender.

Social Influence and the Influence of Gender as a Moderator Variable: Social influence is defined as an individual's perception of how their relatives or friends would react to their use of technology (Venkatesh et al., 2003), as well as the extent to which other individuals such as family members, friends, and colleagues, as well as external factors such as the environment, advertisements, and feedback from real customers, influence their beliefs (Khan, 2022; Rembulan & Firmansyah, 2020; Sharma et al., 2017). Study done by Alkhowaiter (2020) This is to investigate the variables that impact the favorable attitude, intention to adopt, and actual usage of mobile payments in GCC nations. Regarding attitude, social influence was found to have a relatively moderate correlation, whereas its connection with behavioral intention was significantly stronger. Consequently, it is hypothesized that:
H3: Social influence positively influences banking consumers' behavioral intention to adopt digital banking.
H3a: The effect of social influence on banking consumers' behavioral intention to adopt digital banking is moderated by gender.

Facilitating Condition and the Influence of Gender as a Moderator Variable: Facilitating condition refers to the availability and accessibility of resources that are crucial for promoting the adoption of a specific behavior on the platform (Rahman et al., 2020) With an assumption that there is an adequate infrastructure in place to facilitate the usage of the technology (Songkram, 2023). Infrastructure encompasses knowledge, management, organization, and technical support capabilities (Nikou & Economides, 2017). Thusi and Maduku (2020) Conducted a study on Generation Y retail banking users to investigate the factors that influence the uptake and utilization of mobile banking services. The desire of Generation Y to use mobile banking apps is significantly influenced by factors such as performance expectancy, facilitating conditions, and habit. As a result, it is hypothesized that:
H4: Facilitating conditions positively influence banking consumer's behavioral intention to adopt digital banking
H4a: The effect of facilitating conditions on banking consumers' behavioral intention to adopt digital banking is moderated by gender.

Hedonic Motivation and the influence of gender as moderator variable: Hedonic motivation pertains to the pleasure one experiences from the activity, such as an aesthetically pleasing and visually stunning design of the platform, which stimulates the consumer's inclination to adopt technological advancement (Anggraeni et al., 2021). The study conducted by Hassan et al. (2022) Revealed a statistically significant positive correlation between hedonic motivation and the intention to use health information applications. This finding aligns with other research that demonstrated consumers derive satisfaction from using health information applications. (Brown & Venkatesh, 2005; Venkatesh et al., 2012). Consumers who participate in mobile commerce are driven by hedonic motivation, which is a significant factor for them. (Vinerean et al., 2022). Based on these analyses, it is hypothesized that:
H5: Hedonic motivation positively influences banking consumers' behavioral intention to adopt digital banking.
H5a: The effect of hedonic motivation on banking consumers' behavioral intention to adopt digital banking is moderated by gender.

Price Value and the Influence of Gender as a Moderator Variable: Price value refers to the consideration that consumers give to the amount of money they will need to invest to use an application, as well as their

perception of the application's worth (Venkatesh et al., 2012). Adopting technology in the consumer's setting may result in extra costs for the consumer (Alalwan et al., 2017). The UTAUT2 model includes the price value as it has an impact on consumer intention to adopt, as customers are the ones who suffer the expenses (Venkatesh et al., 2012). The study conducted by Chaveesuk et al. (2022) reveals that prices have a significant impact on the behavioral intention to adopt massive online open courses (MOOCs) in Poland. In addition, the pricing value of a telemedicine application has a significant role in determining its adoption by individuals, as shown by Rahi (2022) and consistent with prior studies by Baudier et al. (2020) and Gao et al. (2015). Consequently, it is hypothesized that:

H6: Price value positively influences banking consumers' behavioral intention to adopt digital banking.

H6a: The effect of price value on banking consumers' behavioral intention to adopt digital banking is moderated by gender.

Habit and the influence of gender as moderator variable: A habit can be defined as a learned behavior that is triggered by an unintended stimulus and provides rewarding outcomes (Merhi et al., 2019). Consequently, consumers will cultivate a propensity for deploying technology with more frequency. In the study done by Samsudeen et al. (2022) Surveyed Islamic Banking consumers in Sri Lanka to identify the elements that impact their inclination to adopt mobile banking services. They employ the Unified Theory of Acceptance and Use of Technology (UTAUT2) as their framework. There is a significant correlation between habit and customer adoption intention. This indicates that the way customers use technology significantly influences their willingness to embrace mobile banking. Based on these analyses, it is hypothesized that:

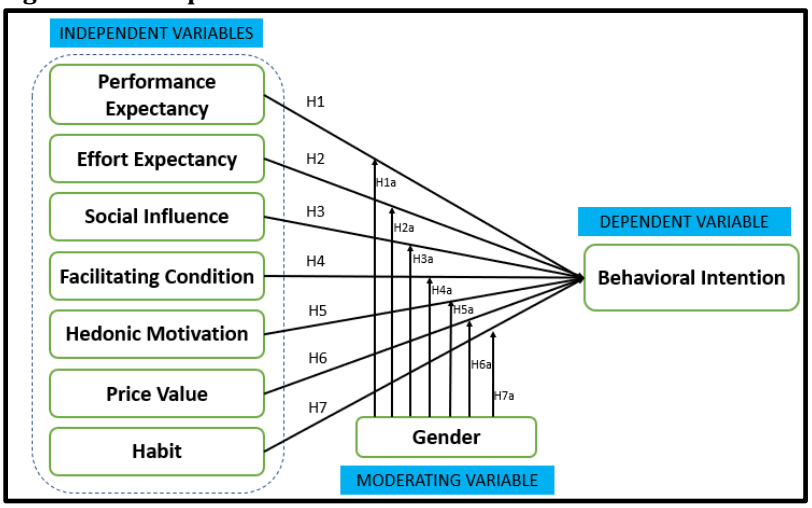
H7: Habit positively influences banking consumers' behavioral intention to adopt digital banking.

H7a: The effect of habit on banking consumers' behavioral intention to adopt digital banking is moderated by gender.

Conceptual Model

In developing nations, digital banking offers a distinct perceived benefit compared to its application in wealthy countries. (KPMG, 2020). Following the approval from the Minister of Finance, Bank Negara Malaysia (BNM) publicly released the names of the five applicants who were granted digital bank licenses on April 29, 2022 (Hen, 2022). This news garnered extensive attention to the potential of digital banking in Malaysia. Understanding the requirements of Malaysian customers in certain target demographics is crucial for ensuring the efficiency of digital banking in the country. The researchers have revised the framework of UTAUT2 by incorporating a single moderator, namely gender as can be seen in Figure 4.

Figure 4: Conceptual Model



3. Methodology

A self-administered questionnaire will be employed to gather data on the suggested model. This study will use a Purposive sample technique to select a non-probability sample frame from the specified population. The

approach was selected because it will assist researchers in comprehending consumers' intention to adopt digital banking. The completed surveys will be evaluated using the Statistical Package for Social Science (SPSS) and the Structural Equation Model (SEM).

4. Conclusion

Digital banking is essential in the banking sector as it enhances operational efficiency and customer service, providing consumers with a convenient and user-friendly banking experience. (Ahn & Lee, 2019). It improves the efficiency and effectiveness of the business model by decreasing operating costs, such as the inefficiencies of using paper-based documents for billing, credit card statements, receipts, and other uses. The banking business has been significantly influenced by information technology, leading to the development of user-friendly banking systems. This has enabled individuals without bank accounts to access new markets and benefit from various financial services. (Zahid et al., 2021). Based on the results of a survey conducted by PricewaterhouseCoopers (PwC) among banking consumers in Malaysia, it was found that the consumers had a negative experience when accessing traditional banking services. (PwC, 2019). Consumers exhibit a lack of commitment toward their existing financial institutions and will seek alternatives if their needs are not fulfilled. (Marcous, 2014). Thus, this proposed study aims to understand how performance expectancy, effort expectancy social influence, facilitating condition, hedonic motivation, price value and habit can influence behavioral intention with gender as a moderator variable.

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The Influence of Technostress on Employee Well-Being Among Generation Z Employees in Malaysia

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Abstract: Today's digital-centric world has spawned a new phenomenon called 'technostress', a stress condition due to constant changes, advancements and reliance on technology. Technostress is a rising issue in terms of its influence on employee well-being as technostress has been causing the deterioration of employee well-being. There is an urgency to understand and study the influence of technostress on employee well-being so that measures can be taken to rectify the matter and improve employee well-being. This study aims to examine which technostress creators have the most influence on employee well-being among Generation Z employees in Malaysia. Past literature to understand employee well-being, technostress and the relationship between the two were studied. Technostress creators were identified as techno-overload, techno-complexity, techno-uncertainty, and techno-insecurity. The study found that techno-uncertainty is the technostress creator that has the most influence on Generation Z employees' well-being in Malaysia. Data collection was conducted by using a virtual questionnaire. 135 respondents among Generation Z employees in Malaysia participated in this study.

Keywords: *Technostress, employee well-being, Generation Z employees, techno-overload, techno-complexity, techno-uncertainty, techno-insecurity.*

1. Introduction and Background

Employee well-being is a concept that is particularly familiar to those involved in human resources. It encompasses various aspects of an employee's health, including physical health, mental health, emotional health, and spiritual health. Additionally, it refers to an employee's overall experience and satisfaction with their job and organization (Mertala et al., 2023). When employees have a positive experience and satisfaction with their job and the organization, their well-being is considered high. According to Wang et al. (2022), employee well-being is a crucial outcome of organizational studies and is tied to unlocking human potential. This implies that employees in good health are more likely to feel empowered, motivated, and productive, ultimately enhancing the organization's overall performance. Therefore, organizations should prioritize employees' well-being and investigate factors that influence it to address any challenges that arise.

A growing concern is the impact of technology-induced stress, or technostress on employee well-being. Despite advancements in technology, there is limited research on the extent of technostress's influence on employee well-being (Wang et al., 2022). This study examines the relationship between technostress and employee well-being. Employee well-being can be simply described as a positive work-related experience. However, its significance extends beyond the individual, affecting an organization's health and output. In a healthy organization, both performance and employee well-being can co-exist and reinforce each other (Singh & Jha, 2021). As Generation Z enters the workforce, organizations must consider unique approaches to enhance their well-being, given their generational differences.

In today's digital era, technostress is a factor that may influence employee well-being. Constantly adapting to new or complex technology leads to technostress, which Tiwari (2020) defines as the inability to cope with ever-evolving information and communication technologies (ICTs). Technostress consists of four creators, namely, techno-overload, techno-complexity, techno-uncertainty and techno-insecurity (Wang et al., 2020). These creators can cause stressful situations related to technology use, negatively impacting employee well-being by causing burnout, feelings of inadequacy and job security fears. Generation Z, as digital natives, is likely

to experience technostress due to their constant interaction with technology (Putriani & Apriani, 2022). This raises questions about technostress's impact on Generation Z's well-being in the workforce, considering the rapid technological changes shaping their values and behavior (Pichler et al., 2021).

There is a lack of literature providing sufficient insights into the relationship between technostress and employee well-being (Wang et al., 2022). Furthermore, Yener et al. (2020) note that previous research on technostress and workplace harm lacks clarity and conclusive answers. This suggests that existing studies do not adequately address the relationship between technostress and employee well-being, particularly among Generation Z employees in Malaysia. This study aims to identify which technostress creators (techno-overload, techno-complexity, techno-uncertainty, techno-insecurity) most significantly affect employee well-being, among Generation Z employees in Malaysia.

Following the introduction of this paper, the subsequent topics will explain the literature related to the topic, research methods conducted by the researchers, findings, and discussion of the research findings. This paper also will explain the practical implications of the research and recommendations for future research.

2. Literature Review

Past studies have distinguished two philosophies of well-being: (1) the hedonic approach, which focuses on maximizing pleasure and making life more enjoyable, and (2) the eudaimonic approach, which emphasizes meaning, life purpose and self-actualization (Pataki-Bittó & Kun, 2022). Employee well-being tends to align more with the hedonic approach, encompassing cognitive and affective job evaluations (Bartels et al., 2019). This happiness-oriented perspective defines employee well-being as subjective experiences, measured by indicators such as positive affect and job satisfaction (Zhang et al., 2020). Therefore, this study is grounded in the hedonic approach, presenting employee well-being as a positive work experience.

Employee Well-Being

Although there is no single definition of employee well-being (Tuzovic & Kabadayi, 2020), it can generally be categorized into two main definitions: positive experience and overall experience. Hasan and Kashif (2020) define employee well-being as a set of positive feelings that arise when employees feel they contribute to their work's development. Rurkkhum (2023) simplifies this definition by stating that employee well-being involves positive experiences gained as members of an organization. Additionally, Mahomed et al. (2023) define employee well-being as a positive emotional state resulting from evaluating one's work or work experience.

On the other hand, Wang et al. (2022) define employee well-being as overall job satisfaction, where employees assess and balance their positive affect and negative affect. Luu (2020) describes it as the overall quality of an employee's experience and functioning at work. Similarly, Islam and Amin (2021) define employee well-being as the optimal psychological experience and functioning of individual employees. Well-being is further recognized as the overall quality of employee experience and functioning, which is crucial for positive individual and organizational outcomes (Sutton & Atkinson, 2023).

Dimensions of Employee Well-being

Pataki-Bittó and Kun (2022) identify three key dimensions in employee well-being research: subjective well-being, physical and mental health, and social well-being. Conversely, Singh and Jha (2021) distinguish two dimensions: employee well-being in terms of work engagement and burnout. Meanwhile, Nabawanuka and Ekmekcioglu (2021) highlight three fundamental aspects of employee well-being: life, work and psychological needs in both life and work domains.

This study examines employee well-being within the workplace context, specifically focusing on the influence of technostress. Employee well-being in the workplace can encompass various aspects such as human functioning, safe employment basic needs, expression of virtues/character strengths, as well as the self-actualization and fulfillment of a meaningful vocation or integrating spirituality with work (Nabawanuka & Ekmekcioglu, 2021). Research also indicates a close link between employee well-being and various performance metrics like productivity, employee turnover, job satisfaction, stress and work-life balance

(Tuzovic & Kabadayi, 2020). Improving employee well-being is associated with positive outcomes such as increased employee commitment and enhanced individual performance (Singh & Jha, 2021). Consequently, contemporary organizations are urged to view employee well-being as a critical business concern and actively foster positive and enriching work environments (Jaiswal & Arun, 2021).

On the flip side, ignoring employee well-being leads to adverse outcomes. For instance, stress can deteriorate an employee's well-being. When this happens, productivity drops, negatively affecting the organization. Tuzovic and Kabadayi (2020) highlight employee well-being as critical for employees and employers, emphasizing its importance. Ensuring an employee's well-being is essential not only for the employee's health but also for the organization's overall performance (Singh & Jha, 2021). This is supported by Zhong et al. (2019) who stated that employee well-being is crucial to the survival and development of organizations.

Generation Z Employee Well-being

Generation Z is the latest generation to enter the workforce. While there is no universally agreed-upon age range, they are generally considered to be born from the mid-1990s to the early 2010s. Specifically in Malaysia, Generation Z includes those born between 1998 – 2002 (Tjiptono et al., 2020). This generation is known for its extensive use of digital technology, having never experienced a time before the internet (Seibert, 2021).

Generation Z is well-known for their commitment to maintaining well-being and mental health, and as they enter the workforce, they are recognized for demanding work-life balance. This highlights that Generation Z prioritizes well-being as employees. Organizational support for psychological health and well-being greatly benefits Generation Z employees (Pichler et al., 2021). Described as the most achievement-oriented, Generation Z is economically better off, highly educated, and very diverse (Harris, 2020) demonstrating their potential to strive in the workplace.

However, mental health issues and well-being challenges are also prevalent among Generation Z. This is likely because Generation Z employees are more open about their mental health struggles and the treatment or therapy they receive (Bernecker & Becker, 2021), viewing it not as a stigma but as an effort enhance well-being. In contrast, older generations may perceive Generation Z's dedication to well-being as sensitivity or an inability to adapt. Therefore, it is crucial to study Generation Z's employee well-being in the workplace, as they will shape the future workforce.

Technostress on Employee Well-being

Currently, the potential impact of technostress on employee well-being is gaining attention (Mohammed, 2022). Wang et al. (2022) assert that technostress negatively affects employee well-being, a view shared by Pansini et al. (2023), who also link technostress to negative effects on behavior, thoughts, attitude, and overall well-being. According to Rurkkhum (2023), organizations must adapt to new routines and methods, heavily relying on technology to thrive. Garg et al. (2022) highlight that prolonged screen time during the pandemic has exacerbated technostress, leading to reduced cognitive performance, discomfort, physical health issues, and decreased mental capacity – all indicative of poor well-being. Therefore, examining the relationship between technostress and employee well-being is crucial.

Technostress combines the terms *technology* and *stress*. According to El Kiassi and Jahidi (2023), Brod (1984) coined the term, defining it as a modern disease stemming from the inability to healthily manage new computer technologies. Technostress is characterized as a negative individual phenomenon caused, either directly or indirectly, by technology (Dahabiyeh et al., 2022). Originating from Anglo-Saxon literature, the concept of technostress has seen increased study over the decades, although it remains under development (Kiassi & Jahidi, 2023). The literature explains technostress as resulting from interactions with technology that lack usability or from inadequate organizational conditions for its use. Additionally, Garg et al. (2022) suggest that technostress arises when individuals struggle to adapt to technological advancements (Garg et al., 2022).

Definition of Technostress: Ibrahim et al. (2023) define technostress as any adverse effects on human behaviors, thoughts, attitudes, and psychology imposed by technology use. Meanwhile, Bondanini et al. (2020) simplify the definition of technostress as stress experienced by end users in organizations because of the use of their technology. Sharma and Gupta (2022) on the other hand define technostress as the mental stress and the negative psychophysical effects that an individual can experience due to the use of information and communications technology (ICT). As the scope of this study is narrowed down to actively working employees, technostress is defined as a phenomenon that is described as the stress that an employee feels owing to the constant presence and change of ICT (Harunavamwe & Kanengoni, 2023). Prior et al. (2023) also define technostress in a workforce sense as workers' stress caused by using digital platforms or ICTs.

Technostress Among Generation Z: Despite being known as the first generation of true digital natives who grew up alongside the advancement of technology, Generation Z has been found to face the phenomenon of technostress (Prior et al., 2023). Lee (2023) attributes the technostress in Generation Z to be caused by rapidly changing digital technologies. Meanwhile, Generation Z's constant technology usage especially on their smartphones has been deemed as a cause of technostress, followed by an overload of social media usage (James et al., 2023). The overload of technology usage heightened during the COVID-19 pandemic, and it led to negative effects on the psychological well-being of Generation Z which is considered as a manifestation of technostress (Wu et al., 2021). The study further states that although the pandemic witnessed an increase in technology usage from Generation Z, they also demanded a digital detox due to the technostress that they were facing because of the lockdown.

Technostress Creators

Ramesh et al. (2021) describe aspects of technology that create stress as technostress creators. This indicates that technostress comprises technostress creators as its dimensions. Several past literature name four technostress creators in common: techno-overload, techno-complexity, techno-uncertainty and techno-insecurity (Bondanini et al., 2020; Korzynski et al., 2020; Wang et al., 2020).

Techno-Overload: Techno-overload is one of the technostress creators identified for this study. Korzynski et al. (2020) simply define techno-overload as a higher workload generated by ICTs. Further defined by Wang et al. (2022), techno-overload refers to a stressful situation where employees have to work longer and faster than usual due to technology. The literature further describes techno-overload as a condition where employees have to spend more time trying to adapt to new technologies that are introduced to their job scope. This is supported by another definition by Shadbad and Biros (2020) where techno-overload is said to occur when users work more, longer and faster due to IT use. A more detailed definition refers to techno-overload as when technology requires employees to work longer and faster, characterized by the completion of more work in less time, information overload and multitasking (Ramesh et al., 2021). El Kiassi and Jahidi (2023) define techno-overload as the increased workload, higher work speed, or change in work habits brought about by new technologies.

Similarly, techno-overload is also said to be experienced when ICT forces users to work faster and longer. (Harunavamwe & Kanengoni, 2023). For instance, Hwang et al. (2021) who studied security technostress give an example of techno-overload occurring when policies or systems require the performance of additional behaviors for document security beyond rudimentary word-processing work. Another example was provided by Pullins et al. (2020) in a sales context whereby techno-overload is described as the stress-creating condition where the sales professional must do additional tasks, faces an increase in the repertoire, ambit and scope of the role and extra work solely due to the use of technology.

Rasool et al. (2022) find that techno-overload has a negative influence on employee well-being whereby techno-overload causes a loss of focus at work and a decline in productivity. According to Wang et al. (2022), there is a negative relationship between techno-overload and employee well-being. The never-ending stream of new information and new concepts to learn and adapt to may affect an employee negatively. This is especially caused by how techno-overload results in longer work hours and a faster work pace. Techno-overload may physically affect an employee in terms of causing them to fall sick due to the constant chase at work. It was also found by Hang et al. (2022) that there is a significant relationship between techno-overload and employee well-

being. Thus, for this study, the actual relationship between techno-overload and employee well-being will be identified.
H_1: There is a significant relationship between techno-overload and employee well-being.

Techno-complexity: Techno-complexity is another technostressor. It is difficult to learn to use ICTs (Korzynski et al., 2020). Wang et al. (2022) define techno-complexity as where employees perceive the complexity of using the technology and experience feeling inadequate about their existing technology skills. Some employees may find modern and new technology to be very complex. Even if they have previously worked with technology, being unable to cope with how complex technology can become may cause the employees to feel like their skills have not been enough. The feelings of inadequacy related to techno-complexity are also linked to the definition by Ramesh et al. (2021) where techno-complexity refers to situations when employees feel inadequate because of the time and effort spent in learning and understanding complex technology. Besides that, El Kiassi and Jahidi (2023) define techno-overload as the inability to learn or manage the complexity of new technologies.

According to Bondanini et al. (2020), techno-complexity is where the technology is so inherently complex that users find it difficult to understand resulting in the users feeling incompetent. Techno-complexity also describes the complexity associated with ICT, which may decrease employee work efficacy whilst increasing the time needed to learn and understand various aspects of ICT (Harunavamwe & Kanengoni, 2023). The idea that techno-complexity may become highly time-consuming is further supported by Shadbad and Biros (2020) whereby the study states that techno-complexity refers to circumstances in which a user is inexpert in using IT and needs to spend time and energy to gain knowledge about IT.

Wu et al. (2021) believe that feelings of complexity may lead to more mistakes and may reduce productivity. An example scenario related to techno-complexity is when management often requires employees to spend additional time and effort to understand complex technology concepts and terms and follow standardized processes and methodologies regardless of their work duties (Hwang et al., 2021). Techno-complexity can be said to primarily occur amongst older generations who are unfamiliar with the advancements of technology as well as employees who do not usually interact with technology in their daily lives. Hwang et al. (2021) support this by stating that older workers or those with longer professional experience reported greater difficulty with the increase in technological complexity for executing tasks.

The difficulty of understanding how complex technology may be able to lower an employee's self-esteem due to feelings of incompetence and inadequacy. A low self-esteem will negatively affect an employee's well-being. Therefore, Wang et al. (2022) states that there is a negative relationship between techno-complexity and employee well-being. Hang et al. (2022) support this by observing that there is a significant relationship between techno-complexity and employee well-being. This study aims to identify whether there is a relationship between techno-complexity and employee well-being.
H_2: There is a significant relationship between techno-complexity and employee well-being.

Techno-Uncertainty: Another technostressor that will be studied is techno-uncertainty. Simply put, techno-uncertainty is related to new ICT developments (Korzynski et al., 2020). According to Wang et al. (2022), techno-uncertainty is feelings of uncertainty due to the pace at which software, hardware and computer networks are constantly changing or evolving. This uncertainty may cause an employee to feel restless as well as feel a lack of stability; they might feel that even if they master a certain technology, there may be advancements in the future that would have to cause them to start from square one all over again. Techno-uncertainty is said to occur when users feel unsettled due to frequent organization-wide upgrades and accompanying software and hardware changes. (Ramesh et al., 2021) Furthermore, techno-uncertainty is also similarly defined as the constant changes in computer hardware and software (El Kiassi & Jahidi, 2023).

Bondanini et al. (2020) explain techno-uncertainty as ambiguity around expectations related to changes, particularly about technology. Employees may not know what to expect from time to time, especially when technology happens to sprout a new advancement or evolution without a warning. This is supported by Hang et al. (2022) explanation of techno-uncertainty where employees feel organizations move from one cycle to another with reduced time between systems upgrades, leaving them unsettled. Shadbad and Biros (2020)

further support this by stating: "Techno-uncertainty relates to users who feel uncertain due to the constant change/upgrades of IT."

Techno-uncertainty involves the continuous changes or upgrades in ICTs that cause ambiguity and stress and add to the daily job demands so that individuals who do not possess the necessary technological skills experience an imbalance between the technological demands and the skills resources that they possess (Harunavamwe & Kanengoni, 2023). This indicates that techno-uncertainty may be a more stressful situation for employees who do not originate from an ICT-centric background or have any technology-centric skills in the first place.

Based on Wang et al. (2022), there is a negative relationship between techno-uncertainty and employee well-being. Uncertainty is a feeling that can cause restlessness, anxiety or the desire to give up before a bad thing happens. Techno-uncertainty may induce fear in employees about what to expect and if further advancements or changes to technology can affect them or their jobs (Hang et al., 2022). This fear will affect the employee's mental state as they are conditioned to feel fear of the unknown which will then cause their well-being to deteriorate. Hang et al. (2022) also found that techno-uncertainty has a significant relationship with employee well-being. In this study, it will be identified whether techno-uncertainty and employee well-being have a relationship.
H_3: There is a significant relationship between techno-uncertainty and employee well-being.

Techno-Insecurity: Lastly, techno-insecurity is the final technostressor that will be studied. Techno-insecurity is simply defined as a job threat due to ICTs by Korzynski et al. (2020). Wang et al. (2022)'s more elaborate definition of techno-insecurity is "a stressful situation where employees feel threatened about losing their jobs to other people who have a better understanding of the technology". Bondanini et al. (2020) support this by describing techno-insecurity as employees feeling threatened by job loss to technology or other people with more technology understanding. Additionally, El Kiassi and Jahidi (2023) define techno-insecurity as job insecurity caused by using technology at work. As commonly understood by most, in today's era of digitalization, more tech-savvy people have a higher likelihood of surviving the workforce. Most job descriptions—regardless of job scope—would ask for at least basic skills in technology.

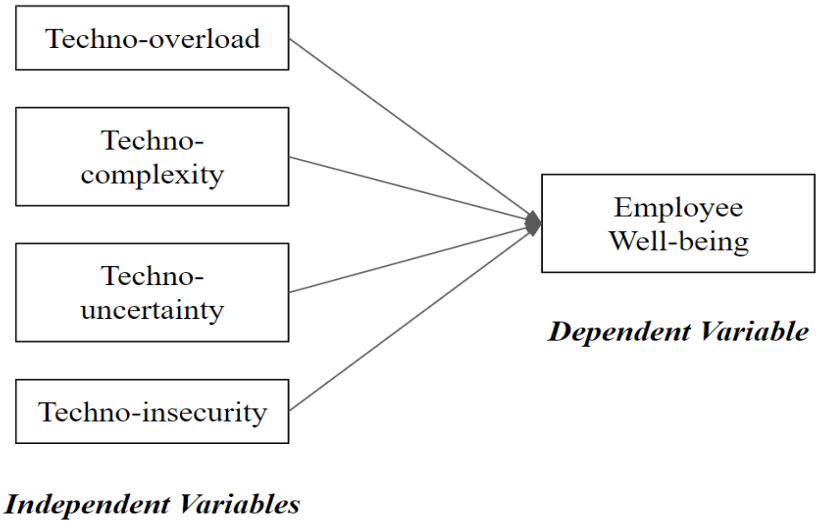
Techno-insecurity also describes situations where a user feels he/she may lose his/her job either by computerization of job tasks or having less knowledge about IT compared to others (Shadbad & Biros, 2020). Ramesh et al. (2021) define techno-insecurity as when employees feel insecure about losing their jobs in the face of new technology and co-workers who might know more about these technologies (Ramesh et al., 2021). Martínez-Navalon et al. (2022) also describe techno-insecurity as a situation when workers are not confident in using ICTs, leading them to think that they cannot cope with the tasks requested and that, in the future, they will be replaced by others. Techno-insecurity creates job loss fear among employees, believing that new technology could lead to automation or could be replaced by people with better skills and abilities. (Garg et al., 2022)

It is a valid concern for employees to not only be threatened by job loss to people with better technology skills but nowadays, employees are also threatened to have their jobs "stolen" by technology itself. The IR4.0 proves how jobs are becoming more automated, making certain jobs redundant to be done by humans because they can be done by technology instead. This may include robots and artificial intelligence (AI). Napolitano (2023) reported that AI was responsible for roughly 5% of jobs lost in the United States alone, while Helhoski (2023) reported that roughly two-thirds of current jobs are likely to be affected by some degree of AI automation.

Techno-insecurity and techno-uncertainty are quite interrelated. They share a common denominator of inducing fear in employees regarding technology (Hang et al., 2022). It is said that techno-insecurity has a negative influence on employee well-being because it causes a lot of stress. Therefore, Wang et al. (2022) states that there is a negative relationship between techno-insecurity and employee well-being. This is supported by Hang et al. (2022) who also found that there is a significant relationship between techno-insecurity and employee well-being. Hence, the relationship between techno-insecurity and employee well-being will be studied.
H_4: There is a significant relationship between techno-insecurity and employee well-being.

Therefore, the research framework adopted in this research, as illustrated in Figure 1, revolves around technology that creates stress as technostress creators that may influence employee well-being (Ramesh et al. (2021). In line with several past literatures, there are four common technostress creators, namely, techno-overload, techno-complexity, techno-uncertainty and techno-insecurity (Bondanini et al., 2020; Korzynski et al., 2020; Wang et al., 2020).

Figure 1: Conceptual Framework of the research



Source: Wang, Ding, and Kong (2022)

3. Research Methodology

This research was conducted from a positivist paradigm perspective that assumes that reality exists out there and is observable, stable, and measurable (Merriam, 2009). In line with that perspective, this cross-sectional correlational research was conducted in line with the objective of this study, which is to determine the relationship between the four dimensions of technostress (i.e. techno-overload, techno-complexity, techno-uncertainty, and techno-insecurity) and employee well-being.

The population of the study was Generation Z employees (those born between 1998 and 2002 in Malaysia), educated and employed in Malaysia. The researchers distributed online survey questionnaires via Google Forms through a social networking platform that is primarily used by Generation Z such as LinkedIn. A total of 135 respondents participated in the research. The research instruments used in the study to measure the independent variables (i.e. technostress) were adopted from Wang et al. (2022) while measurements for the dependent variable (i.e. employee well-being) were adopted from Rurkkhum (2023). Items used in this study are in line with the research framework as Figure 1.

4. Results

This section presents the results of the study which includes the background of respondents, descriptive analysis of the variables, and relationship between the variables.

Backgrounds of Respondents: During the data collection, the researchers took steps to ensure all respondents fulfilled the predetermined criteria i.e. belong to the Generation Z age group, born, educated, and currently employed in Malaysia. From the background information of the respondents, all of them are currently employed. Out of 135 respondents, 11 of them (8.1%) are working in an Information Technology (IT) related job and 124 of them (91.1%) are working in other than IT-related jobs. However, all the respondents are using

technology in the form of applications or software in their jobs. This indicates that the questionnaire of the research, which is about technostress, is relevant as they are technology users. Details of the respondents' background are summarized in Table 1.

Table 1: Demographics Analysis

Demographic	Item	N	N%
Highest level of education	SPM & other certificates	10	7.4%
	Diploma in IT	1	0.7%
	Diploma in other than IT	12	8.9%
	Degree in IT	14	10.4%
	Degree in other than IT	79	58.5%
	Postgraduate in IT	2	1.5%
	Postgraduate in other than IT	17	12.6%
Current employment sector	IT	11	8.1%
	Other than IT	124	91.9%
Frequency of using applications/software	Infrequent	28	20.7%
	Slightly frequent	17	12.6%
	Frequent	40	29.6%
	Very frequent	50	37.0%

Source: Authors own work

Descriptive Analysis of The Variables: To explain the level of the respondents' technostress and their general state of well-being, the researchers conducted a descriptive analysis of the variables under study. As illustrated in Table 2, the scale for employee well-being ranged in high mean. This indicates that the respondents had a high level of employee well-being in their employment, as the mean was in the range of (M = 3.9022, SD = 0.73662). It was near the scale "4 = Agree". Meaning to say, most of them agreed regarding having a good employee well-being.

The scale for the independent variables was similarly ranged from "2 – disagree" to "3 – neutral". This indicates that the respondents were mostly neutral about-facing techno-overload, techno-uncertainty and techno-insecurity. Meanwhile, most of the respondents disagreed about facing techno-complexity which suggests that the respondents are adequate in their technological skills.

Table 2: Descriptive analysis (n=135)

VARIABLES	MEAN (M)	STANDARD DEVIATION (SD)
Dependent Variable		
Employee Well-being	3.9022	.73662
Independent Variables		
Techno-overload	3.1698	1.07533
Techno-complexity	2.9867	1.02919
Techno-uncertainty	3.6037	.90983
Techno-insecurity	3.0630	1.06886

Note: Dependent Variable: "1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree"
Independent Variable: "1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree"
Source: Authors own work

Association Between Technostress and Employee Well-Being: To explain the association between the three dimensions of technostress (namely, techno-overload, techno-complexity, techno-uncertainty, and techno-insecurity) and employee well-being, the researchers conducted a Pearson Correlation Analysis of the variables under study. Correlations analysis looks at the relationship and describes the strength and direction

between two variables. In this research, the Pearson correlation coefficient (*r*) was used to examine the relationship between technostress and employee well-being. According to Hair et al. (2010), the correlation coefficient *r* that is equal to or greater than 0.70 indicates a strong relationship between variables; if the *r* coefficient is between 0.30 and 0.69, the relationship is moderate; and if the *r* coefficient is less than 0.30, the relationship is considered to be weak.

This study's result indicated a positive and significant relationship between techno-uncertainty (r=0.232, p<0.01) and employee well-being. There is a positive and insignificant relationship between techno-overload (r=0.124, p>0.01), techno-complexity (r=0.360, p>0.01) and techno-insecurity (r=0.290, p>0.01) with employee well-being. This finding is illustrated in Table 3.

Table 3: Pearson Correlation Analysis (n=135)

	Employee Well-being	Techno-overload	Techno-complexity	Techno-uncertainty	Techno-insecurity
Employee Well-being	1				
Sig. (2-tailed)					
Techno-overload	.124	1			
Sig. (2-tailed)	.152				
Techno-complexity	0.36	.605**	1		
Sig. (2-tailed)	.678	<.001			
Techno-uncertainty	.232**	.450**	. 398**	1	
Sig. (2-tailed)	.007	<.001	<.001		
Techno-insecurity	.0.29	.618**	.703**	.516**	1
Sig. (2-tailed)	.741	<.001	<.001	<.001	

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Authors own work

Relationship Between Technostress and Employee Well-Being: To explain the relationship between the variables under study, the researchers conducted a Multiple Regression Analysis. The analysis was conducted to determine the relationship between four technostress creators (techno-overload, techno-complexity, techno-uncertainty and techno-insecurity) and explore which of the technostress creators have the most influence on employee well-being.

As illustrated in Table 4, the largest beta coefficient is techno-uncertainty (β .276, p = .007, p <0.05). However, the other technostress creators were not significantly (p >0.05) related to employee well-being. This concludes that only techno-uncertainty is related to employee well-being.

Table 4 also shows that the R^2 value of 0.073 implies that all the independent variables (techno-overload, techno-complexity, techno-uncertainty and techno-insecurity) explained 7.3 percent of the variance (R = 0.217) in the influence of technostress on employee well-being. Hence, the regression model is significant in explaining relationships between the variables.

Table 4: Multiple linear regression

Independent Variables	Standardized Coefficients Beta (β)	t	Sig.
Constant		11.926	<.001
Techno-overload	.121	1.055	.293
Techno-complexity	-.029	-.230	.819
Techno-uncertainty	.276	2.746	.007
Techno-insecurity	-.168	-1.274	.205
R	.271[a]		
R Square (R^2)	0.073		
F	2.570		
Sig. of F Value	.041[b]		

Source: Authors own work

Discussion

The study has found that there is a significant relationship between techno-uncertainty and employee well-being. Based on the results and findings of this study, it is found that techno-uncertainty is the only variable that has a significant relationship with employee well-being. Furthermore, techno-uncertainty is also the technostress creator that has the most influence on employee well-being. It can be said that Generation Z significantly faces techno-uncertainty where they are stressed due to the constant changes in technology in a workplace setting.

Generation Z's struggle in facing uncertainty can be attributed to major world changes that have occurred throughout their prime years. They have grown up in a time of turbulence and instability mixed with hope for a better future (Tjiptono et al., 2020) which can be assumed as the reason why Generation Z faces difficulty with uncertain things. The greatest example would be the COVID-19 pandemic which ties in with a sudden skyrocket in reliance on technology, particularly due to online classes and virtual internships as Generation Z was still studying at the time. Techno-uncertainty brings a lot of stress to Generation Z which then influences their well-being. Thus, it is important to consider what can be done to ensure that Generation Z is well-prepared for technological advancements and changes in the workplace.

This finding is in line with the literature on Generation Z, that despite being known as the first generation of true digital natives who grew up alongside the advancement of technology, Generation Z has been found to face the phenomenon of technostress (Prior et al., 2023). Lee (2023) attributes the technostress in Generation Z to be caused by rapidly changing digital technologies. Meanwhile, Generation Z's constant technology usage especially on their smartphones has been deemed as a cause of technostress, followed by an overload of social media usage (James et al., 2023). The overload of technology usage heightened during the COVID-19 pandemic, and it led to negative effects on the psychological well-being of Generation Z which is considered as a manifestation of technostress (Wu et al., 2021). The study further states that although the pandemic witnessed an increase in technology usage from Generation Z, they also demanded a digital detox due to the technostress that they were facing because of the lockdown.

This finding that techno-uncertainty is negatively related to employee well-being is also in line with the literature. Techno-uncertainty is related to new ICT developments (Korzynski et al., 2020). According to Wang et al. (2022), techno-uncertainty is feelings of uncertainty due to the pace at which software, hardware and computer networks are constantly changing or evolving. This uncertainty may cause an employee to feel restless as well as feel a lack of stability; they might feel that even if they master a certain technology, there may be advancements in the future that would have to cause them to start from square one all over again. Techno-uncertainty is said to occur when users feel unsettled due to frequent organization-wide upgrades and accompanying software and hardware changes. (Ramesh et al., 2021) Furthermore, techno-uncertainty is also similarly defined as the constant changes in computer hardware and software (El Kiassi & Jahidi, 2023).

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Based on Wang et al. (2022), there is a negative relationship between techno-uncertainty and employee well-being. Uncertainty is a feeling that can cause restlessness, anxiety or the desire to give up before a bad thing

happens. Techno-uncertainty may induce fear in employees about what to expect and if further advancements or changes to technology can affect them or their jobs (Hang et al., 2022). This fear will affect the employee's mental state as they are conditioned to feel fear of the unknown which will then cause their well-being to deteriorate. Hang et al. (2022) also found that techno-uncertainty has a significant relationship with employee well-being.

While the other independent variables of the study, namely, techno-overload, techno-complexity, and techno-insecurity (Bondanini et al., 2020; Korzynski et al., 2020; Wang et al., 2020) were found in this study to be not significant in contributing to employee well-being. This finding is in line with findings reported from an exploratorily qualitative study conducted by (Prior et al., 2023). In their study, Prior et al. (2023) collected qualitative data to explore how Generation Z workers experienced technostress and they found that there are two technostress creators, namely, privacy concerns (i.e. prone tracking, badge monitoring, and surveillance cameras) and technology hassle (i.e. confusing updates, outdated software, and inadequate support). The findings reported by Prior et al. (2023) about technology hassles are in line with the dimension of techno-uncertainty as reported by Wang et al. (2022). However, privacy concerns as reported by Prior et al. (2023) are not being reported by Wang et al. (2022). Since research conducted by Prior et al. (2023) was meant to explore how Generation Z workers experienced technostress, thus it could be concluded that Generation Z workers may have experienced technostress a little differently due to their digital native status (Lee, 2023).

5. Managerial Implications and Recommendations

The managerial implication can be drawn from this study is mainly about the phenomena of technostress at the workplace. Firstly, employees whose well-being is not well taken care of may face higher risks of mental health problems. The World Health Organization (2022) supports this in a study where it is found that poor working environments - including excessive workload and job insecurity which are two of the independent variables - pose a risk to the mental health of employees. What makes the issue more concerning is that what affects an employee at the workplace can sometimes be brought back home which causes the employees' well-being to deteriorate even further.

Secondly, the organization would face low productivity among its employees. Aside from mental health, an employee's physical health can also be impacted because of poor well-being. For example, dealing with technostress may lead an employee to spend more time on the computer or the internet. This may physically strain the employee's eyes, and back or cause a headache. When employees are in a poor state of health, they would be unable to deliver their optimum performance at work. There may also be an increase in the rate of absenteeism as well as medical leave. Employees are the backbone of an organization's operations and without the employees, the organization would not be able to achieve its goals and targets.

Lastly, it will harm the community or society. Employees are an integral part of the community as they drive business and income. If employees have poor well-being, the whole community will have to face the consequences of having unhealthy, ill members. Aside from the rise of mental and physical health issues that will affect social circles as well as families, employees who have poor well-being may be unable to lead their children's development which would in turn affect the future workforce. On the other hand, employees with good well-being would be able to give back to their community and raise their children to become future leaders in the workforce one day.

Therefore, it is recommended that, firstly, the implementation of technology-oriented training programs. Regardless of age, generation and background, training is always required to keep up with changes in the working world. For Generation Z who faces techno-uncertainty, organizations should implement technology-oriented training programs to provide them with proficient technology skills and to prepare for any future advancements. This way, Generation Z would feel adequate in their technology skills and would be ready to face any unexpected changes in terms of technology usage. A study found that Generation Z's preference for training is assignments or experimental training (Hasanah & Saragih, 2023). Thus, organizations can implement hands-on training for Generation Z employees to equip them with the necessary technology skills.

Secondly, mentoring is a culture that should be fostered in the workplace. Especially considering that Generation Z is still relatively new in the working world, organizations should foster a culture where Generation Z can reach out to more tech-savvy colleagues who can assist them in using more advanced technology. Although Generation Z is known to be the tech-savvy generation, they might find the usage of technology in the workplace to be different compared to usage for leisure or fun and would require assistance from their seniors. This is supported by a study that has found that Generation Z is interested in having mentor support in the workplace. (Pietroń--Pyszczek & Borowska, 2022). Therefore, senior colleagues should play a role in extending a helping hand to Generation Z.

Lastly, it is recommended to establish clear communication channels when there are any changes or updates to the organization's technology. Generation Z is accustomed to having information at their fingertips and being in constant communication through digital media (Bredbenner, 2020). This suggests that the techno-uncertainty that Generation Z faces can be worsened if the changes happen suddenly without any prior notice. Generation Z is a generation that prefers to stay in the know at all times rather than having to abruptly adapt to changes. Thus, communicating these changes would allow Generation Z employees to prepare themselves and understand which areas of the technology change they would need assistance with.

Conclusion

The impact of technology-induced stress (technostress) is a rising matter whereby the advancements in technology have been shown to influence the well-being of employees. Yet, there are not enough studies which identify the extent of the influence of technostress on employee well-being (Wang et al., 2022). Therefore, this study has examined the influence of technostress on employee well-being. Employee well-being can be simply described as a positive experience that an employee feels related to their work or in the workplace. However, it holds more significance than just to the employee and may determine the health and output of an organization. In a healthy organization, performance (profit and productivity) as well as employee well-being can not only co-exist but can be mutually reinforced (Singh & Jha, 2021). Now that Generation Z has recently started entering the workforce, organizations need to consider the unique approaches to enhancing Generation Z employee well-being, considering their generational differences.

It is predicted that Generation Z is most likely to experience technostress problems because they live in a digital world (Putriani & Apriani, 2022). It raises a curiosity as to whether technostress would impact Generation Z's well-being as employees in the workforce. Especially considering that Generation Z is the generation of digital natives, it would be beneficial to understand if technology poses a challenge for them in a working context. The rapid growth in technology is a foundational catalyst for the change in values and behavior among Generation Z, compared to those of the previous generations (Pichler et al., 2021).

There is a scarcity of literature that provides sufficient insights into the relationship between technostress and employee well-being (Wang et al., 2022). Furthermore, Yener et al. (2020) question that previous literature on technostress causing harm to employees at the workplace contains unanswered questions and inconclusive answers. This indicates that the existing research does not provide enough clarity on the relationship between technostress and employee well-being, particularly among Generation Z employees in Malaysia. Therefore, the purpose of this study is to examine which of the technostress creators (techno-overload, techno-complexity, techno-uncertainty, techno-insecurity) have the most influence on employee well-being, among Generation Z employees in Malaysia.

This research found that only techno-uncertainty is related to employee well-being. However, the other technostress creators (techno-overload, techno-complexity, and techno-insecurity) were not significantly related to the Generation Z employee well-being under study. This finding is in line with the literature on Generation Z, that despite being known as the first generation of true digital natives who grew up alongside the advancement of technology, Generation Z has been found to face the phenomenon of technostress (Prior et al., 2023). This finding that techno-uncertainty is negatively related to employee well-being is also in line with the literature. Techno-uncertainty is related to new ICT developments (Korzynski et al., 2020). According to Wang et al. (2022), techno-uncertainty is feelings of uncertainty due to the pace at which software, hardware and computer networks are constantly changing or evolving.

Therefore, it is recommended that, firstly, the implementation of technology-oriented training programs. Regardless of age, generation and background, training is always required to keep up with changes in the working world. For Generation Z who faces techno-uncertainty, organizations should implement technology-oriented training programs to provide them with proficient technology skills and to prepare for any future advancements. This way, Generation Z would feel adequate in their technology skills and would be ready to face any unexpected changes in terms of technology usage. A study found that Generation Z's preference for training is assignments or experimental training (Hasanah & Saragih, 2023). Thus, organizations can implement hands-on training for Generation Z employees to equip them with the necessary technology skills.

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Hybrid Working and Employee Job Performance in Felcra Berhad: An Examination of The Moderating Role of Job Satisfaction

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Abstract: In today's dynamic work environment, understanding the impact of hybrid working on job performance is crucial. Many organizations, including FELCRA Berhad, adopted hybrid working during the COVID-19 pandemic to enhance employee efficiency and flexibility. This study explores FELCRA Berhad's job performance and satisfaction during the pandemic and evaluates the potential success of hybrid working post-pandemic. Using a quantitative research design and purposive sampling, data were collected from FELCRA Berhad employees through online and physical questionnaires. The data were analyzed with IBM SPSS Version 28 to examine the relationship between hybrid working (working conditions, work-life balance, and recognition) and job performance, with job satisfaction as a moderating factor. The results indicated a significant positive relationship between working conditions and job performance. While work-life balance and recognition showed moderate positive relationships with job performance, they were not statistically significant. Job satisfaction did not significantly moderate these relationships. However, the group effect for hybrid working remained significant across all dimensions. In conclusion, the study confirms a significant positive relationship between hybrid work conditions and job performance, providing a foundation for FELCRA Berhad to consider implementing hybrid work practices based on their direct effects on job performance.

Keywords: *Hybrid Working, Job Performance, Job Satisfaction, Working Conditions, Work-Life Balance*

1. Introduction and Background

The COVID-19 pandemic in 2020 initiated significant changes in the global work environment as efforts intensified to curb the virus's spread. The World Health Organization (WHO) provided workplace guidelines that necessitated considerable adjustments to traditional work models (Shaw et al., 2020). Governments worldwide mandated remote working policies, accelerating a trend that had been slowly gaining traction. In 2019, only 5.4 percent of workers in European Union (EU) countries regularly worked from home, with 9 percent doing so occasionally (European Union, 2020). The pandemic transformed this gradual shift into an urgent requirement, compelling businesses to swiftly adopt new operational models and invest in necessary technology and infrastructure. This rapid adaptation included widespread adoption of video conferencing by companies, governments, and educational institutions (Teräs et al., 2020).

By mid-2020, 17.4 percent of the global workforce was engaged in remote work, according to the International Labor Organization (ILO, 2021). In Malaysia, during the Movement Control Order, 44 percent of surveyed employees reported working from home (DOS, 2020). However, hybrid working was more prevalent among regular employees in the public or private sectors. Industries such as retail, hospitality, and tourism, however, found it difficult to transition to hybrid working due to the nature of their operations (Soares et al., 2021).

FELCRA Berhad, a Malaysian government-linked corporation focused on rural economic development, experienced significant disruptions due to the pandemic. The company, responsible for managing large agricultural areas and providing support services, had to halt its operations and shift its employees to remote work. The focus of the study is on the employees working at the headquarters of FELCRA Berhad including those who worked hybrid when COVID-19 hit Malaysia, encompassing all departments. After the first Malaysian Movement Control Order (MCO) was lifted in May 2020, FELCRA Berhad reopened its office to employees. To ensure safety and operational continuity, FELCRA Berhad implemented hybrid working by enforcing a rotational work schedule, dividing employees into Group A and Group B, with each group working on alternate days. This transition was challenging due to inadequate technology and infrastructure. Despite these obstacles, the pandemic highlighted the necessity of flexible work models. The shift to remote work improved productivity, control, and impact of work-life balance (WLB) for many employees. Before the pandemic, teleworking was a term primarily used in scientific research to describe both fully remote and

hybrid work models. The pandemic expanded the adoption of teleworking across all levels of society (López-Igual & Rodríguez-Modroño, 2020). Hybrid working, which combines remote and in-person work, has become increasingly important as organizations seek to enhance employee satisfaction, and job performance, and reduce costs while curbing infectious diseases. This model offers employees the flexibility to choose their work location and schedule, potentially increasing job satisfaction and reducing stress (Sokolic, 2022). For employers, hybrid working provides access to a broader talent pool and reduces real estate costs (De Lucas Ancillo et al., 2020). It also boosts productivity by allowing employees to work in environments best suited to their needs. Additionally, hybrid working positively impacts WLB, helping employees manage work and personal responsibilities more effectively, leading to better mental health and job performance (Gayathiri et al., 2013). However, hybrid working also presents challenges. Research indicates that work-life conflicts can negatively affect employee well-being and productivity, particularly for women, due to the lack of inclusive leadership in domestic care (Palumbo, 2020; Bhumika, 2020).

This study adopts Herzberg's Two-Factor Theory (1959), which identifies hygiene factors (e.g., work conditions and WLB) and motivators (e.g., recognition and autonomy) as key to employee motivation. Understanding these factors is crucial for developing effective hybrid work environments. The COVID-19 pandemic has accelerated the adoption of hybrid working, revealing both its benefits and challenges. However, hybrid working can also lead to work-life conflicts and negatively impact employee well-being. The purpose of this study is to analyze the opportunities and challenges of implementing hybrid working in Malaysia and its effects on job satisfaction and performance. The study focuses on FELCRA Berhad during the pandemic and explores the potential for successful hybrid working post-pandemic. Using a quantitative research design, data were collected from employees who experienced hybrid working during COVID-19. The analysis examines the relationship between hybrid work dimensions (working conditions, WLB, and recognition) and job performance, with job satisfaction as a moderating factor. In conclusion, this study aims to provide a comprehensive understanding of hybrid working's impact on employee performance and job satisfaction, offering insights for future policies and practices in Malaysia.

2. Literature Review

Hybrid Working: The COVID-19 pandemic has significantly transformed traditional work environments, leading to the widespread adoption of hybrid work models that combine remote and in-office work. This literature review summarizes key findings on the impact of hybrid working on job performance and job satisfaction, with a focus on studies conducted during the pandemic. Hybrid working has been shown to positively impact job performance by offering employees the flexibility to choose their work environment, thereby enhancing productivity and engagement. Yang et al. (2021) found that employees in hybrid or work-from-home programs reported higher job satisfaction and perceived performance compared to those solely in-office. Similarly, research in Malaysia by Yee et al. (2023) indicated improved job performance due to reduced commuting time and a comfortable home environment. Hybrid work environments also foster creativity by allowing employees to work in spaces where they feel most productive, thereby stimulating innovative thinking and problem-solving (Choudhury et al., 2020). However, maintaining effective communication and collaboration remains challenging. While hybrid work models provide considerable advantages, organizations must overcome these challenges to maximize their potential. As hybrid working becomes more prevalent, it will play a crucial role in creating more productive, innovative, and engaging work environments. The hybrid working relationship with Job Performance is moderated by job satisfaction.

Working Condition: The COVID-19 pandemic has made working from home a primary workplace for many employees, yet the impact of home office environments on job satisfaction and productivity remains underexplored (Xiao et al., 2020). Studies often overlook the detailed conditions of home offices, generalizing remote work experiences without accounting for diverse home environments. Although reduced commute time and fewer office distractions are recognized as factors that enhance productivity, the quality of home office setups is often overlooked. Proper home office conditions, including ergonomic furniture, technology, and a designated workspace, play a crucial role in ensuring job satisfaction and performance (Yang et al., 2021). Research shows varied outcomes regarding productivity in remote work, with some studies highlighting improvements driven by personalized work environments (Choudhury et al., 2020). However, interruptions, inadequate workspace, and lack of office equipment can hinder productivity (Bailey & Kurland, 2002). A well-

designed home office aligns with Herzberg's Two-Factor Theory, emphasizing the importance of hygiene factors in avoiding job dissatisfaction. To develop effective remote work policies, it is essential to understand the specific components of home office environments and their impact on diverse demographic groups (Vyas & Butakhieo, 2021). Future research should focus on these elements to optimize remote work conditions and enhance employee well-being and productivity. Therefore, this leads to the first hypothesis (H1) of this study, which is:
H1: There is a significant relationship between Working Conditions and Job Performance.

Work-Life Balance and Job Performance: The impact of hybrid working on work-life balance (WLB) has gained significant attention, particularly as the distinctions between work and personal life continue to blur. Bellmann and Hübler (2021) noted that working from home can diminish WLB, leading to burnout and difficulties in disconnecting from work. Singer-Velush et al. (2020) further supported this observation, finding that employees often engage in work during non-traditional hours. However, hybrid working can also enhance WLB by enabling employees to manage responsibilities more effectively, which in turn can improve job performance (Aprilina & Martdianty, 2023). This flexibility is particularly beneficial for those with caregiving duties or long commutes (Kossek et al., 2021). Despite its widespread adoption during the COVID-19 pandemic, the full impact of hybrid working on WLB and employee well-being remains underexplored. Research by Krajčík et al. (2023) suggests that hybrid working offers the best WLB compared to exclusively office-based or remote work. Factors such as organizational culture, managerial support, and job nature significantly influence these outcomes (Vyas, 2022). In Malaysia, Zainal et al. (2022) found that a well-planned WLB strategy positively affects health, motivation, and employee retention. Effective WLB is especially crucial during unprecedented challenges like the pandemic (Kori & Omar, 2022). Comparative studies of different hybrid arrangements could further optimize these models for employee benefits. However, despite the advantages, hybrid working in public agencies often encounters challenges. Research by Colley (2010) found that in traditional cultures, a strong work ethic often emphasizes long hours and physical presence in the workplace as markers of commitment. This cultural perspective can discourage employees from taking advantage of work-life balance (WLB) arrangements, such as flexible hours or remote work, as these options may be viewed as indicative of a lack of dedication. Understanding these dynamics is key to helping organizations enhance job satisfaction and productivity through tailored WLB strategies. This understanding is directly related to the study's second hypothesis (H2) as follows:
H2: There is a significant relationship between WLB and Job Performance.

Recognition: The shift to hybrid work environments, combining remote and in-office work, has significant implications for rewards and recognition programs in organizations. Traditional recognition methods may be less effective in hybrid settings, potentially leading to feelings of isolation among employees. Therefore, organizations must adapt their recognition strategies to meet the unique challenges and opportunities presented by hybrid working, aiming to enhance employee motivation, satisfaction, and performance (Yang et al., 2021). Research demonstrates a positive correlation between employee recognition and job performance (Vyas, 2022). Effective recognition programs foster high performance by acknowledging and supporting employees (Hussain et al., 2019). However, improper implementation of these programs can lead to resentment and decreased job satisfaction (Stasiła-Sieradzka et al., 2023). It is essential to tailor recognition approaches to individual preferences and leverage digital tools for virtual acknowledgment (Bailey & Kurland, 2002). In government agencies, traditional norms that prioritize seniority over performance can undermine the effectiveness of recognition programs, leading to decreased motivation and job satisfaction (Shrout, 2024). Additionally, occupational stress and perceived unfairness in reward distribution negatively impact job performance (Devi & Lahkar, 2021; Hassan, 2012). In conclusion, adapting recognition programs to hybrid work environments is crucial for boosting employee motivation and performance. Organizations must understand the nuances of hybrid work to create supportive and engaging workplaces. Future studies comparing recognition in hybrid versus fully remote or in-office environments will provide further insights into optimizing these programs. Thus, H3 becomes the third hypothesis of this study:
H3: There is a significant relationship between Recognition (in hybrid working) and Job Performance.

Job Satisfaction as Moderator: The relationship between job satisfaction and job performance has been extensively studied, consistently revealing a positive correlation. High job satisfaction leads to increased employee engagement, motivation, and commitment, all of which enhance job performance. Satisfied

employees are more committed, proactive, and productive, driven primarily by intrinsic motivation (Cooper, 2020). Job satisfaction also moderates the impact of work-life balance (WLB) on performance by amplifying positive effects and mitigating conflicts (Soomro et al., 2019). In hybrid work environments, job satisfaction boosts performance by fostering a sense of fulfillment and alignment with work conditions (Corral, 2024). The flexibility and autonomy inherent in hybrid models enhance motivation and satisfaction, thereby improving performance (Sampat et al., 2022). In Malaysia, Yunus and Kamal (2017) emphasized Herzberg's Two-Factor Theory, highlighting the critical role of job satisfaction in enhancing performance. Overall, the literature supports the positive relationship between job satisfaction and job performance. Organizations that prioritize job satisfaction by fostering a supportive environment, providing professional growth opportunities, offering recognition, and involving employees in decision-making processes can create a virtuous cycle of enhanced performance and satisfaction. Understanding and leveraging job satisfaction as a moderating factor is essential for achieving high performance and competitive advantage in a dynamic business environment. Hence, a hypothesis is formed as H4 below:

H4: To what extent does job satisfaction mediate the relationship between hybrid working conditions (work-life balance and recognition) and job performance?

3. Research Methodology

This research adopts a quantitative approach, focusing on correlational studies to explore the relationship between hybrid working, job performance, and the moderating effect of job satisfaction among employees at FELCRA Berhad. The study encompasses all employees based at the FELCRA Berhad Headquarters in Wangsa Maju, Kuala Lumpur, with a purposive sample of 128 participants selected. The research instrument includes adapted questions sourced from various references, organized into sections covering demographics, hybrid working (working conditions, WLB, and recognition), job satisfaction and job performance. The chapter concludes with a detailed description of the data analysis stages, encompassing reliability and validity testing, frequency analysis, and correlation analysis. The study's findings and conclusions were derived from quantitative statistical analyses performed using Statistical Package for the Social Sciences Version 28 (SPSS 28), known for its robust capabilities in analyzing academic research, particularly in quantitative studies. A summary of the data analysis for each research question is provided in Table 1.

Table 1: **Summary of Data Analysis**

Research Objective	Measurement	Concept/Construct	Scale	Statistic
To identify the relationship between hybrid working and job performance	Is there a significant relationship between Working Conditions (hybrid working) and Job Performance?	What relationship between Working Conditions (hybrid working) and Job Performance?	Interval-Likert scale	Pearson Correlation Multiple Regression
To identify the relationship between hybrid working and job performance	Is there a significant relationship between WLB (hybrid working) and Job Performance?	Relationship between WLB (hybrid working) and Job Performance	Interval-Likert scale	Pearson Correlation Multiple Regression
To identify the relationship between hybrid working and job performance	Is there a significant relationship between recognition (hybrid working) and job performance?	Relationship between recognition (hybrid working) and job performance	Interval-Likert scale	Pearson Correlation Multiple Regression
To determine whether job satisfaction moderates the relationship between hybrid working arrangements and job performance	Does job satisfaction moderate the relationship between hybrid working (working conditions, WLB and recognition) and job performance?	The influence of job satisfaction as a moderator on the relationship between hybrid working and job performance	Interval-Likert scale	Hierarchical Regression Analysis

4. Results

A total of 150 questionnaires were distributed and all were returned, demonstrating a high engagement rate. However, 12 questionnaires were unusable due to incomplete responses, resulting in 128 usable questionnaires. This represents 85.3 percent of the total, indicating strong participant cooperation and effective data collection.

Profile of Respondents: The demographic distribution of the respondents shows a balanced representation with 57.8 percent female and 42.2 percent male participants. The age group is predominantly 26–35 years old (50.8 percent), followed by 36–45 years old (28.9 percent), with smaller percentages in other age brackets. Most respondents are married (65.6 percent), while singles and widowed/separated individuals account for 26.6 percent and 7.8 percent, respectively. In terms of education, 43.8 percent hold a Bachelor's degree, 25.8 percent have an STPM/Diploma, 20.3 percent completed SPM, and 10.2 percent possess a Master's or PhD. The job positions vary, with non-executives comprising 36.7 percent, managers 34.4 percent, executives 25.8 percent, and upper management 3.1 percent. Notably, all respondents were employed during the COVID-19 pandemic, indicating a 100 percent employment rate during this period.

Normality after Factor Analysis: Table 2 reveals varying degrees of skewness and kurtosis across different dimensions, all showing negative skewness—Work Condition (-0.672), WLB (-0.638), Recognition (-0.862), Job Satisfaction (-0.892), and Job Performance (-1.264)—indicating a general trend towards higher ratings. According to established guidelines by Hair et al. (2010) and Kline (2011), these skewness values fall within acceptable ranges (±2 and ±3, respectively), suggesting no severe deviation from normality. Kurtosis values for Work Condition (-0.084) and WLB (0.346) are near zero, while Recognition (1.449) and Job Satisfaction (0.867) show positive kurtosis. However, Job Performance (3.908) exceeds normal levels, indicating the presence of more outliers. Despite this, all values adhere to acceptable kurtosis ranges (±7 by Hair et al. and Bryne, and ±10 by Kline), ensuring the data suitability for further analysis. These findings suggest a generally positive sentiment towards work conditions, with some variability, particularly in Job Performance.

Table 2: Normality Results: Values for Skewness and Kurtosis (n=128)

Dimensions	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Std. Error
Work Condition	-.672	.214	-.084	.425
WLB	-.638	.214	.346	.425
Recognition	-.862	.214	1.449	.425
Job Satisfaction	-.892	.214	.867	.425
Job Performance	-1.264	.214	3.908	.425

Reliability after Factor Analysis: To assess reliability, Cronbach's alpha was calculated for each measure to evaluate the consistency and stability of the instrument used. According to Hair et al. (2010), a minimum acceptable value for Cronbach's alpha is 0.70, although a value of 0.60 is acceptable for exploratory studies. This analysis ensures the quality and reliability of the measures used in the research (Sekaran & Bougie, 2013).

Table 4: Summary of Reliability Analysis after Factor Analysis (n=141)

Dimensions	No. of Items	Cronbach's Alpha	Internal Consistency
Work Condition	6	.756	Good
WLB	5	.885	Excellent
Recognition	5	.787	Good
Job Satisfaction	5	.819	Excellent
Job Performance	5	.900	Excellent

The results in Table 4 show the reliability analysis of the survey revealed strong internal consistency across all dimensions, as measured by Cronbach's alpha. The Work Condition dimension (6 items) had an alpha of 0.756, indicating good reliability. The WLB dimension (5 items) showed excellent consistency with an alpha of 0.885.

The Recognition dimension (5 items) had a good alpha of 0.787, while the Job Satisfaction dimension (5 items) exhibited excellent reliability with an alpha of 0.819. The Job Performance dimension (5 items) achieved the highest alpha of 0.900, demonstrating exceptional reliability. These results confirm that the survey reliably measures work conditions, WLB, recognition, job satisfaction, and job performance, making it a dependable tool for assessing workplace environments.

Pearson Correlation Analysis: Table 5 below shows the correlation analysis between the components of the physical workplace environment (lighting, room temperature, and ergonomics) and the components of the behavioral workplace environment (WLB, incentive and recognition plan, training and development, transparent or open communication, and good relations with co-workers) against the dependent variable of the study, which is employee productivity

Table 5: Pearson Correlation Analysis

Variable	Working Condition	WLB	Recognition	Job Performance
Working Condition	1			
WLB	.554**	1		
Recognition	.389**	.347**	1	
Job Performance	**.377****	**.300****	**.265****	1

**. Correlation is significant at the 0.01 level (2-tailed).

The correlation analysis strongly supports the hypothesis that better working conditions, WLB, and recognition are significantly associated with improved job performance in hybrid work environments.

Multiple Regression Analysis: Table 6 below shows the multiple regression analysis between working conditions, WLB, recognition, and job performance

Table 6: Multiple Regression Analysis

Independent Variable	Standard Coefficients Beta	t	Sig.
Working Condition	.269	2.649	.009
WLB	.109	1.087	.279
Recognition	.123	1.36	.176
R Square		.167	
F		8.279	
Sig. of F value		<.001	
Durbin Watson		1.938	

Table 6 illustrates the analysis of the relationship between working conditions, WLB, recognition, and job performance in hybrid work environments, revealing nuanced findings.

Hierarchical Regression Analysis: Table 7 below shows the hierarchical regression analysis between working conditions, WLB, recognition, job satisfaction, and job performance

Table 7: Hierarchical Regression Analysis

					Change Statistics				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**	**R Square Change**	**F Change**	**df1**	**df2**	**Sig. F Change**
1	.409a	.167	.147	.60667	.167	8.279	3	124	<.001
2	.506b	.256	.232	.57558	.089	14.761	1	123	<.001
3	.527c	.278	.236	.57417	.022	1.201	3	120	.312

The analysis of the three models reveals varying explanatory power regarding job performance, highlighting the importance of specific workplace variables. Model 1, which includes working conditions, WLB, and recognition as predictors, accounts for 16.7 percent of the variance in job performance and is statistically significant (R^2 = 0.167, Sig. F Change <.001). This indicates that these factors are meaningful contributors to job performance. In Model 2, the inclusion of job satisfaction enhances the explained variance to 25.6 percent (R^2 = 0.256), highlighting job satisfaction as a crucial predictor. The significant R Square Change of 0.089 (Sig. F Change <.001) underscores its substantial impact on job performance. However, Model 3, which incorporates interaction terms between job satisfaction and the three initial predictors, shows only a slight increase in explained variance to 27.8 percent (R^2 = 0.278). The additional variance explained by the interaction terms is minimal (R Square Change = 0.022) and not statistically significant (Sig. F Change = 0.312). This suggests that while job satisfaction directly influences job performance, it does not significantly moderate the effects of working conditions, WLB, and recognition on job performance, leading to the rejection of Hypothesis H4.

Summary of Hypotheses: Table 8 shows the result of the summarized hypotheses for the study on the moderating effect of job satisfaction towards the relationship between hybrid working and job performance among employees at FELCRA Berhad.

Table 8: Summary of Hypotheses

H	Hypotheses	Analysis	Data	Results
H1	There is a significant relationship between Working Conditions (hybrid working) and Job Performance.	Pearson Correlation Multiple Regression	(0.377) (r.=0.009, p>0.05) r^2=0.167, F value = 8.279 F<0.001	Moderate Positive Relationship Accepted Significant positive relationship Accepted as a Group (Hybrid Working)
H2	There is a significant relationship between WLB (hybrid working) and Job Performance.	Pearson Correlation Multiple Regression	(0.300) (Sig.=.279, p>0.05) (r2=0.167, F value = 8.279 F<0.001)	Moderate Positive Relationship Rejected No significant relationship Accepted as a Group (Hybrid Working)
H3	There is a significant relationship between Recognition (hybrid working) and Job Performance.	Pearson Correlation Multiple Regression	(0.265) (r.=0.176, p>0.01) (r^2=0.167, F value = 8.279 F<0.001)	Positive Relationship Rejected No significant relationship Accepted as a Group (Hybrid Working)
H4	Job satisfaction moderates the relationship between hybrid working (working conditions, WLB and recognition) and job performance.	Hierarchical Regression Analysis	**Model 1** (R^2 = 0.167, Sig. F Change <.001) **Model 2** (R^2 = 0.256, Sig. F Change <.001) **Model 3** (r^2=0.278, Sig. F Change = 0.312)	**Model 1** Accepted statistically significant **Model 2** Accepted **Model 3** Rejected

Discussion

The findings reveal statistically significant positive correlations between these factors and job performance, suggesting that enhancing these aspects can lead to higher employee productivity, improved work quality, and overall efficiency. The Pearson correlation coefficient between working conditions and job performance is 0.377, indicating a moderate positive relationship. This suggests that as the quality of working conditions improves, employees tend to perform their tasks more effectively. The significance level for this correlation is less than 0.001, indicating that the observed relationship is highly unlikely to have occurred by chance. Practical improvements in working conditions, such as better resource availability, effective communication, and flexible scheduling, can significantly enhance job performance. Organizations should focus on providing adequate technological support, clear communication channels, flexible work schedules, and a supportive organizational culture to boost employee engagement and productivity (Sokolic, 2022). The correlation analysis also reveals a significant relationship between WLB and job performance, with a Pearson correlation coefficient of 0.300. This positive correlation suggests that better WLB is associated with improved job performance. The significance level is less than 0.001, indicating a low probability that this relationship is due to chance. Improving WLB involves implementing flexible working hours, providing resources for stress management, fostering a culture that respects personal time, and ensuring manageable workloads. Employees who experience a better balance between their professional and personal lives are likely to be more satisfied, less stressed, and more motivated, leading to better job performance. Studies by Sharma and Yadav (2023) and Budhkar and Salve (2023) support these findings, emphasizing the importance of flexibility, supportive leadership, and effective management in hybrid work settings. Additionally, the analysis reveals a positive relationship between recognition and job performance, with a Pearson correlation coefficient of 0.265.

Although this correlation is modest, it is statistically significant with a p-value of 0.002, indicating a strong likelihood that the observed relationship is genuine. Recognition serves as a motivational factor, enhancing employees' sense of accomplishment and morale, which can lead to increased productivity and performance. The study's sample size of 128 participants further enhances the reliability and generalizability of these findings. Consistent with previous research by Lartey (2021), recognition is identified as a critical component of employee motivation and performance.

These findings underscore the importance of improving working conditions, WLB, and recognition to enhance job performance in hybrid work environments. Organizations can achieve this by providing technological support, fostering clear communication, offering flexible scheduling, promoting WLB policies, and implementing effective recognition strategies. By leveraging these insights, employers can better motivate and support their employees, leading to higher engagement, job satisfaction, and performance outcomes. In conclusion, the correlation analysis provides robust evidence supporting the hypothesis that there is a significant relationship between working conditions, WLB, recognition, and job performance in hybrid work models. The statistically significant positive correlations emphasize the importance of these factors in fostering a productive and high-performing workforce. Organizations should design and implement policies and practices that enhance these aspects to maximize employee well-being and performance, ultimately leading to a more successful and sustainable business.

The study also indicates that improved working conditions significantly enhance job performance, as evidenced in multiple regression analysis by a Beta coefficient of .269 and a significant t-value of 2.649 ($p = .009$). This aligns with Hypothesis 1 (H1) and corroborates previous research, such as Naz et al. (2020), which highlights the critical role of a supportive work environment in boosting employee productivity. In hybrid work settings, factors like flexible scheduling, effective communication, and ergonomic furniture are pivotal in creating a productive atmosphere. These elements collectively improve employee well-being and engagement, leading to higher levels of job performance and satisfaction (Yang et al., 2021). Contrary to expectations, the analysis revealed no significant relationship between WLB and job performance (Beta = .109, $t = 1.087$, $p = .279$), thus not supporting Hypothesis 2 (H2). This finding contrasts with earlier studies, such as those by Kossek and Lautsch (2018), which emphasized the importance of WLB in influencing job performance. The discrepancy may be due to unique characteristics of the study's sample or specific context, which could mitigate the impact of WLB on performance. Similarly, the study found no significant effect of recognition on job performance (Beta = .123, $t = 1.36$, $p = .176$), not supporting Hypothesis 3 (H3). This result is unexpected given the extensive literature on the motivational benefits of recognition, such as the study by Manzoor et al. (2021).

In a hybrid work environment, factors like intrinsic motivation and virtual communication may have a more substantial impact than traditional recognition programs.

Overall, the regression model was statistically significant ($F = 8.279$, $p < .001$) with an R Square of .167, indicating that 16.7 percent of the variance in job performance can be explained by working conditions, WLB, and recognition. The Durbin-Watson statistic of 1.938 suggests no significant autocorrelation, indicating that the model's assumptions are met. These findings suggest that organizations should prioritize improving working conditions to enhance job performance in hybrid environments. However, the non-significant effects of WLB and recognition indicate that additional or alternative factors may need to be considered to improve job performance. Future research should explore other potential determinants, such as employee autonomy, technological support, and virtual team dynamics, and include longitudinal studies to understand how these relationships evolve as hybrid work models become more established.

The study's hierarchical regression analysis results highlight the critical impact of specific workplace variables on job performance. Model 1 demonstrates that working conditions, WLB, and recognition collectively account for a substantial portion of the variance in job performance ($R^2 = 0.167$, Sig. F Change <.001). This finding aligns with existing literature that posits optimal working conditions and appropriate recognition are crucial for enhancing employee productivity and satisfaction (Ntimba et al., 2021). The significant enhancement in explanatory power observed in Model 2 with the inclusion of job satisfaction ($R^2 = 0.256$, Sig. F Change <.001) underscores its importance as a determinant of job performance. Recent studies, including those by Wang et al. (2020) and Fisher et al. (2019), emphasize the critical role of job satisfaction in improving employee performance, motivation, and overall productivity. Specifically, Wang et al. (2020) note that job satisfaction and work motivation are reciprocally related, with satisfied employees being more motivated and engaged, leading to higher performance levels.

The addition of interaction terms between job satisfaction and the initial predictors in Model 3 does not lead to a statistically significant improvement ($R^2 = 0.278$, R Square Change = 0.022, Sig. F Change = 0.312). This indicates that while job satisfaction is a crucial direct predictor of job performance, it does not significantly moderate the relationships between working conditions, WLB, recognition, and job performance. This finding aligns with the study's broader conclusions regarding the complex dynamics between job satisfaction and job performance. Despite being a direct predictor, job satisfaction does not significantly alter the impact of other factors on performance. Research by Katebi et al. (2021) supports this nuanced view, indicating that job satisfaction and performance are reciprocally influential but do not moderate the effects of other factors. This study underscores the importance of focusing on improving working conditions and recognizing employees to enhance job performance directly, while also acknowledging the pivotal role of job satisfaction as an independent predictor.

5. Managerial Implications and Recommendations

If in the future employers at FELCRA Berhad decide to implement a hybrid working model, they must prioritize the improvement of home working conditions. Ensuring that employees have a conducive and productive home environment is crucial for the success of such a model. This includes providing necessary equipment, ergonomic furniture, reliable internet access, and any other resources that support efficient remote work. Specifically, FELCRA Berhad could offer allowances for Unifi fiber internet to ensure stable and high-speed connectivity and replace all desktop computers with laptops to facilitate flexibility and mobility. By addressing these aspects, FELCRA Berhad can enhance employee well-being, maintain productivity, and ensure a seamless transition between home and office work environments.

Additionally, it is recommended that FELCRA Berhad place more emphasis on physical recognition rather than online recognition. The findings indicate that virtual acknowledgments have not shown a significant impact on employee morale and engagement. While online recognition can be convenient, it often lacks the personal touch and immediacy that in-person recognition provides. By organizing events, award ceremonies, and face-to-face appreciation moments, FELCRA Berhad can foster a stronger sense of community and appreciation among employees. Managers should also make a conscious effort to compliment and acknowledge staff achievements in person when they are at the office, rather than relying solely on virtual praise. This approach helps build a

more cohesive and motivated workforce, reinforcing the value of each employee's contributions in a tangible and impactful way. By adopting these recommendations, FELCRA Berhad can create a more supportive and effective hybrid working environment, ultimately contributing to the organization's overall success and employee satisfaction.

This study can be further extended by exploring additional factors that influence job performance in hybrid settings. This includes examining the role of organizational culture alongside WLB and recognition. Understanding how various aspects of the work environment contribute to employee satisfaction and productivity is crucial. Future studies should also include diverse participants from different government agencies to enhance the generalizability of the findings. Employing qualitative methods, such as interviews or focus groups, can provide deeper insights into employees' experiences with hybrid working. These methods can uncover the nuanced interplay between job satisfaction and job performance, revealing personal perspectives and contextual factors that quantitative methods may overlook. Additionally, considering job satisfaction as a mediating variable in the relationship between hybrid work conditions and job performance could offer further insights. Moreover, including independent variables related to hybrid work conditions, such as technological support, communication quality, and organizational support, can provide a more comprehensive understanding of the factors influencing job performance. These elements are essential for maintaining employee engagement and productivity in a hybrid work environment. By addressing these areas, future research can offer more detailed guidance on optimizing hybrid work models to enhance employee performance and satisfaction.

Conclusion

The study explores the relationships between working conditions, WLB, recognition, and job performance in hybrid work environments, revealing valuable insights. A moderate positive relationship was found between working conditions and job performance, as confirmed by both Pearson correlation and regression analysis. This highlights the importance of ergonomic setups, digital tools, and flexible office spaces (Grzegorczyk et al., 2021; Kossek et al., 2021). While WLB showed a moderate positive correlation with job performance, regression analysis did not find it statistically significant, suggesting that other factors may play a more dominant role (Talukder, 2021). Recognition also did not show a significant impact on job performance, potentially due to the complexities of hybrid work environments, where intrinsic motivation and the quality of virtual communication are more influential (Pandya, 2024; Hopkins & Figaro, 2021).

Furthermore, job satisfaction was identified as a crucial direct predictor of job performance, significantly enhancing the explanatory power of the models. However, it did not significantly moderate the relationship between hybrid work conditions and job performance (Davidescu et al., 2020; Judge et al., 2001). These findings suggest that organizations should focus on improving both working conditions and job satisfaction independently to enhance job performance.

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Conceptualizing the Implications of Artificial Intelligence (AI) Tools and Personalization Marketing on Consumer Purchase Intention: Insights from the Malaysian E-Commerce Market

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Abstract: Artificial intelligence (AI) has emerged as a powerful tool, enabling online retailers to offer highly personalized shopping experiences tailored to individual preferences and behaviors. As e-commerce continues to grow in Malaysia, understanding the influence of AI and personalization marketing on consumer purchase intentions has become increasingly important for businesses seeking to remain competitive. However, the rapid adoption of AI also raises concerns about data privacy, ethical AI usage, and compliance with emerging data protection regulations, such as Malaysia's Personal Data Protection Act (PDPA). This study aims to explore the potential impact of artificial intelligence (AI) and personalization marketing on consumer purchase intention within the Malaysian e-commerce market. By reviewing previous literature and theoretical frameworks, the study explores how the use of AI tools including predictive analytics automation, and personalization experiences might influence consumer behavior in online shopping environments. The study adopts a quantitative approach, in which quota sampling will be used for the participant selection. A self-administered questionnaire with a five-point Likert scale will be employed to gather data from e-commerce users in Malaysia. The findings from this study have important implications for both e-commerce businesses and policymakers in Malaysia. For businesses, understanding which aspects of AI and personalization most influence consumer purchase intentions can help them strategically implement these technologies to enhance customer engagement and drive sales. For policymakers, the study highlights the need to consider ethical and legal issues, such as data privacy and policy issues, in the growing use of AI in the e-commerce market.

Keywords: *Artificial intelligence, Predictive analytics, Automation, Personalization marketing, Customer purchase intention*

1. Introduction and Background

The rapid implementation of artificial intelligence (AI) in the e-commerce market has drastically transformed how businesses interact with consumers. The application of AI technologies, in addition to personalized experiences, is reforming online shopping by tailoring content to individual consumer preferences and behaviors. AI is transforming the e-commerce market by creating new opportunities for entrepreneurs to innovate and improve their business strategies (Bansal & Bansal, 2023). Taylor (2024) has claimed that the AI market within the marketing domain was evaluated at $15.84 billion in 2021, revealing its significant impact on the industry. Forecasts indicate that this market is expected to experience substantial growth, with its overall value anticipated to exceed $107.5 billion by 2028. This rapid development underscores the increasing reliance on AI technologies in marketing and their potential to transform e-commerce landscapes on a global scale. Previous studies have underscored the growing importance of AI tools and personalization marketing in enhancing customer engagement and driving purchase intentions. For example, a study by Huang and Rust (2021) has highlighted the critical role of AI in creating dynamic shopping experiences, which significantly influence consumer behavior. Equally, Yadav and Pavlou (2020) have emphasized that personalization, powered by AI not only improves customer satisfaction but also positively impacts purchase intentions.

Furthermore, Nguyen and Simkin (2022) discover how AI algorithms, particularly those focused on customer segmentation and recommendation systems, can predict consumer preferences and improve the accuracy of targeted marketing efforts. In the context of the Malaysian e-commerce market, Rahman et al. (2021) specifically address the increasing reliance on AI in the Malaysian e-commerce market, noting that businesses leveraging these technologies report higher conversion rates and customer retention. Given the rapid growth of e-commerce in the Malaysian market, understanding the impact of AI and personalization marketing on consumer purchase intention is crucial for businesses striving to remain competitive.
The integration of artificial AI into the e-commerce market has significantly altered consumer interactions, with AI tools and personalization marketing strategies each playing a distinct role in this evolution. Nonetheless,

despite the widespread adoption of AI tools in research studies, there remains a critical gap in understanding their specific impact within emerging e-commerce markets like Malaysia. Most existing studies focus on foreign e-commerce markets, leaving a void in the literature concerning cultural and regional influences on consumer responses to AI-based tools and personalization (Grewal et al., 2020; Huang & Rust, 2021). Moreover, the ethical implications and data privacy concerns associated with AI tools usage have not been thoroughly addressed, particularly in regions where regulatory frameworks may lag behind technological advancements, potentially prioritizing innovation at the expense of consumer privacy (Kaplan & Haenlein, 2019; Sundar et al., 2019; Lommatzsch et al., 2020; Kumar et al., 2021). Although various AI tools, such as recommendation systems, chatbots, and machine learning algorithms, have been examined about consumer behavior and purchase intention (Luo et al., 2019; Huang & Rust, 2020; Qin & Jiang, 2021), there is a notable gap in understanding how predictive analytics and automation specifically influence customer purchase intention.

Hence, this study seeks to bridge these gaps by exploring the theoretical and practical implications of AI tools and personalization marketing on consumer purchase intentions in the Malaysian e-commerce market by focusing on predictive analytics and automation as independent variables. In addition, it addresses the ethical and privacy challenges associated with these technologies, offering a comprehensive analysis of their impact. This study seeks to examine the potential influence of AI tools and personalized marketing on consumer purchase intentions within the Malaysian e-commerce market, offering insights that may guide future research and strategic decisions in the industry. The research objectives and research questions are as follows:

Research Objectives

RO1: To examine the impact of predictive analytics on consumer purchase intention within the Malaysian e-commerce market.
RO2: To examine the impact of automation on consumer purchase intention within the Malaysian e-commerce market.
RO3: To evaluate the influence of personalization marketing on consumer purchase intention within the Malaysian e-commerce market.

Research Questions

RQ1: How does predictive analytics impact consumer purchase intention within the Malaysian e-commerce market?
RQ2: How does automation affect consumer purchase intention within the Malaysian e-commerce market?
RQ3: What is the influence of personalization marketing on consumer purchase intention within the Malaysian e-commerce market?

2. Literature Review

Malaysian E-Commerce Markets

The Malaysian e-commerce market has undergone substantial growth, led by increasing internet penetration and evolving consumer preferences. According to Statista (2023) as of 2023, the market is valued at approximately RM 24.5 billion and is projected to expand at a compound annual growth rate (CAGR) of 12.6% through 2027. Main e-commerce platforms such as Shopee, Lazada or TikTok Shop lead the market due to their user-friendly interfaces, extensive product ranges, and competitive pricing. A study by Ahmad et al. (2023) discovered that these platforms collectively capture over 60% of the Malaysian market share, significantly influencing consumer purchasing behavior. Moreover, e-commerce is becoming increasingly prominent in Malaysia, with platforms like Facebook, Instagram and TikTok playing a crucial role in online shopping activities. According to a report by eMarketer (2024), social commerce sales in Malaysia are expected to reach RM 5.4 billion by the end of 2024, highlighting the growing integration of social interactions with online shopping. Lim and Lee (2022) determined that this integration enhances consumer engagement and purchase intentions through the use of social proof and peer recommendations. Besides, mobile commerce which also on the rise, suggesting the increasing trend of shopping via mobile apps and optimized websites. Data from the Malaysian Communications and Multimedia Commission (MCMC) (2023) indicates that mobile commerce transactions account for approximately 45% of total e-commerce sales in Malaysia. Tan et al. (2024) stated that platforms such as GrabMart and Shopee's mobile app are particularly popular, contributing to the convenience and accessibility that drive market growth. These findings underscore the rapid growth of the Malaysian e-

commerce landscape and the significant impact of various platforms on consumer behavior and market dynamics.

Underpinning Theories

The Technology Acceptance Model (TAM) presents a comprehensive framework for understanding how users come to accept and use technology. In the context of AI tools and personalization marketing, the model emphasizes that consumers' perceptions of usefulness and ease of use are crucial determinants of their intention to engage with AI-driven tools. Davis (1989) defines perceived usefulness as the extent to which consumers believe that a system will enhance their shopping experience, while perceived ease of use indicates the degree to which they expect the technology to be effortless to use. Past studies have expanded TAM to assess AI's influence on consumer behavior, demonstrating that AI-driven tools, such as predictive analytics and recommendation systems, positively impact purchase intentions when consumers view these tools as enhancing their shopping efficiency and experience (Venkatesh & Davis, 2000; Gefen et al., 2003). Kapoor et al. (2021) found that personalized product recommendations based on user preferences increased purchase intentions due to their perceived usefulness in simplifying decision-making. Moreover, consumers are more likely to engage with AI tools perceived as user-friendly and capable of delivering relevant, personalized content with minimal effort (Sun & Zhang, 2022). TAM thus suggests a theoretical perspective on how the effectiveness of AI tools and personalization marketing strategies can drive customer purchase intentions by aligning with consumers' expectations of utility and ease of use. Conversely, the Theory of Planned Behavior (TPB) provides another significant framework for this study in examining the impact of AI tools and personalization marketing on customer purchase intentions. TPB suggests that an individual's behavioral intentions are influenced by their attitudes towards the behavior, subjective norms, and perceived behavioral control (Ajzen, 1991). From the AI tools and personalization marketing point of view, these enhance customer experience by tailoring content and recommendations to individual preferences, which positively influences attitudes towards the brand and products (Zhang et al., 2023). Additionally, personalization marketing facilitated by AI shapes subjective norms through social proof and peer influences, further affecting purchase intentions (Lee & Kim, 2022). AI-driven tools also enhance perceived behavioral control by providing more relevant and timely options, thereby simplifying decision-making and increasing confidence in purchasing decisions (Wang & Zhang, 2023). These insights highlight the significant role of AI tools and personalization marketing in shaping consumer behavior, in line with TPB's core principles.

Artificial Intelligence Tools

Recent research has extensively explored the impact of various AI tools on consumer purchase intentions, demonstrating their significant role in modern marketing strategies. Luo et al. (2021) assessed the effectiveness of chatbots, revealing that these AI-driven systems enhance customer engagement and satisfaction by providing real-time, personalized interactions. This improvement in user experience positively influences purchase intentions by addressing customer needs more effectively. Similarly, Choi et al. (2022) investigated predictive analytics, finding that these tools enable more precise forecasting of consumer behavior, which enhances targeting and personalization. This increased accuracy in addressing consumer preferences contributes to a higher likelihood of purchase. Hwang et al. (2023) focused on AI-driven email marketing, showing that personalized content delivered through AI algorithms significantly boosts open and click-through rates, which are strongly associated with increased purchase intentions. Additionally, Kumar et al. (2023) reviewed the impact of marketing automation tools, highlighting how automation streamlines processes and improves targeting, thereby enhancing consumer engagement and boosting purchase intentions through more relevant and timely content. Collectively, these studies illustrate the transformative effect of AI tools on consumer behavior, emphasizing their critical role in driving purchase intentions through improved personalization and marketing efficiency.

Personalization Marketing

Personalization marketing involves the practice of tailoring marketing messages and experiences to individual consumers based on their behaviors, preferences, and interactions. This method seeks to enhance relevance and engagement by delivering content and offers that are specifically designed to meet the needs and interests of each user (Arora et al., 2021). Personalization marketing strategies often utilize data analytics and machine learning algorithms to segment audiences, predict customer behavior, and deliver customized experiences across various digital channels, including websites, emails, and social media (Lambrecht & Tucker, 2020).

Previous studies have pointed out the effectiveness of personalization marketing in driving consumer engagement and purchase intentions. For example, Ansari et al. (2022) established that personalized product recommendations significantly increase consumer satisfaction and purchase likelihood by providing tailored suggestions that align with individual preferences. Likewise, a study by Choudhury et al. (2023) highlighted that personalization marketing communications, which leverage data-driven insights, develop higher response rates and strengthen customer loyalty. Also, Kordzadeh and Gable (2023) discovered that personalized digital experiences improve consumer retention and conversion rates by generating more meaningful and relevant interactions. These findings collectively demonstrate the significant impact of personalization on digital marketing outcomes, emphasizing its role in enhancing customer engagement and driving purchase intentions.

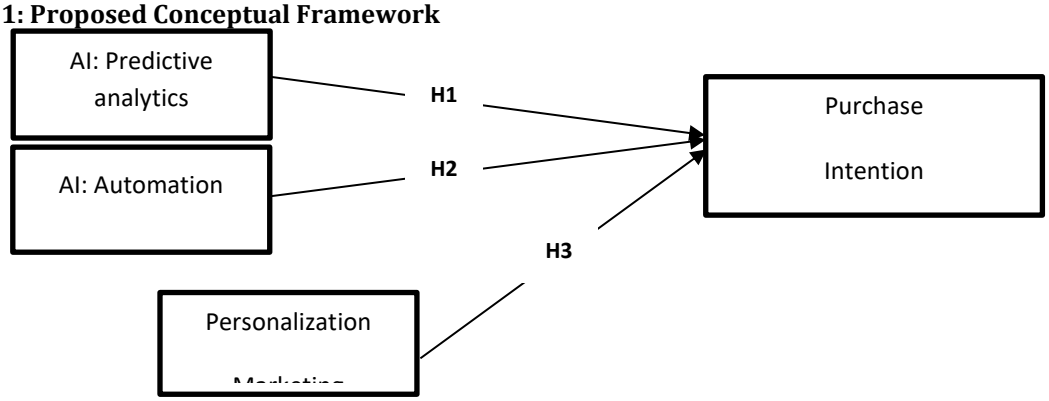
Consumer Purchase Intention

Kotler and Keller (2016) defined consumer purchase intention as the likelihood or probability that a consumer will engage in a purchase decision based on various marketing stimuli and interactions experienced through digital channels. It is often characterized as the consumer's readiness or propensity to buy a product or service, which can be influenced by factors such as perceived value, personal relevance, and marketing effectiveness. Understanding consumer purchase intention is important for digital marketers, as it helps to design strategies that can effectively drive conversions and enhance sales performance. Recent studies have highlighted the key factors influencing consumer purchase intention in digital marketing contexts. A study by Zhang et al. (2023) showed that personalization and targeted content significantly enhance purchase intentions by making marketing messages more relevant and engaging for individual consumers. Additionally, Kim and Kim (2022) found that the perceived quality of digital interactions and user experience plays a critical part in shaping purchase intentions, with higher-quality interactions leading to an increased likelihood of purchase. Furthermore, Lee et al. (2023) highlighted the impact of social proof and user reviews on consumer purchase decisions, noting that positive feedback and ratings can significantly boost customer purchase intentions by building trust and credibility. These studies collectively point out the importance of various digital marketing factors in influencing consumer purchase intentions, stressing the need for businesses to optimize their strategies based on these insights.

3. Proposed Conceptual Framework and Hypotheses Development

The conceptual framework proposed for this study is illustrated in Figure 1, showing the relationship between AI tools; predictive analytics and automation, and personalization marketing with the consumer purchase intention within the Malaysian e-commerce market.

Figure 1: Proposed Conceptual Framework



Relationship between Artificial Intelligence Tools with Purchase Intention

Predictive analytics involves the utilization of historical data and statistical algorithms to forecast consumer behaviors (Choi, Lee, & Kim, 2022). Research has shown that such a method enhances purchase intentions. For example, Choi, Lee, and Kim (2022) discovered that predictive analytics improves marketing effectiveness by tailoring offers to consumer preferences, which increases engagement and purchase likelihood. Similarly, Kumar, Rajan, Gupta, and Pozza (2021) demonstrated that personalized recommendations based on predictive models positively influence purchase intentions. Qin and Jiang (2021) further corroborated this by

demonstrating that innovative predictive analytics systems are particularly effective at driving purchase intentions. Sun and Zhang (2022) added that predictive analytics not only personalizes marketing but also enhances the overall consumer experience, leading to higher purchase intentions. Therefore, this study attempts to measure the relationship between AI tools: predictive analytics and consumer purchase intention by proposing the following hypothesis:
H1: Predictive analytics has a positive impact on consumer purchase intention within the Malaysian e-commerce market.

Automation refers to the utilization of technology to perform tasks with minimal human intervention (Kapoor, Dwivedi, & Piercy, 2021). Automation plays a critical role in enhancing marketing efficiency and effectiveness. Previous studies highlight that automation positively influences consumer purchase intention by streamlining processes and personalizing interactions. For instance, Kumar, Aksoy, and Donkers (2023) found that marketing automation systems increase engagement by delivering timely and relevant communications, which increases the likelihood of purchase. Similarly, Hwang, Kim, and Yang (2023) emphasize that automated tools like chatbots enhance the shopping experience by providing instant customer support and personalized recommendations, leading to higher purchase intentions. Moreover, automated advertising strategies improve targeting accuracy, making ads more relevant to consumers and thus more likely to drive purchases (Kapoor et al., 2021). All in all, automation improves marketing effectiveness by personalizing consumer interactions, streamlining processes, and optimizing engagement strategies. These improvements contribute to increased consumer purchase intentions. Based on the aforementioned arguments, this study aims to explore the impact of automation on consumer purchase intention by proposing the following hypothesis:
H2: Automation has a positive impact on consumer purchase intention within the Malaysian e-commerce market

Relationship between Personalization Marketing with Purchase Intention
Kotler and Keller (2016) described personalization marketing as the practice of tailoring marketing efforts to individual consumer preferences and behaviors, which plays a vital role in influencing consumer purchase intentions. The authors argued that personalization marketing involves customizing messages, offers, and experiences to meet the specific needs of individual consumers, thereby enhancing the relevance and impact of marketing communications. Unlike AI-driven personalization, traditional personalization approaches rely on segmentation and consumer data analysis to craft targeted strategies. Previous research has shown that such personalized efforts significantly boost consumer engagement. Arora, Lodish, and Rawal (2021) found that personalization marketing increases consumer responsiveness, as it aligns closely with their preferences. Additionally, Ansari, Koenigsberg, and Stahl (2022) demonstrated that personalization marketing communications elevate the perceived value of offers, thereby strengthening purchase intentions. Lee and Kim (2022) also observed that personalization fosters consumer trust and satisfaction, which are critical for driving purchase decisions. Therefore, this study attempts to measure the relationship between personalization marketing and consumer purchase intention by proposing the following hypothesis:
H3: Personalization marketing positively influences consumer purchase intention within the Malaysian e-commerce market.

4. Research Implications

The implications of this study are multifaceted. Theoretically, this study contributes to the growing body of knowledge on AI in marketing by proposing a conceptual framework that links AI tools with consumer purchase intention. It invites further empirical research to validate these relationships, particularly within the Malaysian e-commerce context, where the adoption of AI technologies is rapidly evolving but remains underexplored. However, the study's conceptual nature means it lacks empirical data to support its hypotheses, and the framework may not fully capture all variables influencing consumer behavior. Practically, the findings suggest that businesses should strategically invest in AI technologies to enhance their marketing efforts, leading to higher consumer conversion rates, improved customer loyalty, and a greater competitive advantage. Nonetheless, the study's recommendations may not account for industry-specific variations or regional differences outside of Malaysia. From a policymaker's perspective, the study highlights the importance of establishing supportive regulations and guidelines that facilitate the ethical use of AI tools and personalization in marketing. This involves ensuring that consumer privacy and data security are maintained while promoting

innovation within the e-commerce sector. The limitations of this study underscore the need for further empirical validation and broader contextual analysis.

5. Conclusion

This study proposes to examine the potential impact of AI tools, particularly focusing on predictive analytics, automation, and personalization marketing, on consumer purchase intention within the Malaysian e-commerce market. By synthesizing insights from previous literature, the study proposed that these AI tools and personalization marketing could significantly enhance consumer purchase behavior. In particular, predictive analytics, which forecasts consumer preferences and behaviors, allows marketers to deliver highly personalized experiences, thereby increasing consumer engagement and purchase intention. On the other hand, automation enhances operational efficiency and streamlines customer interactions, contributing to a seamless shopping experience that fosters consumer trust and satisfaction. Although this study is conceptual and does not incorporate empirical data, it lays essential groundwork for future research. Validating the proposed framework through empirical studies could provide actionable insights for e-commerce businesses and policymakers, ultimately fostering a more competitive, innovative, and consumer-friendly market environment in Malaysia. Additionally, future research could also examine the effects of specific AI tools on various consumer segments and assess their effectiveness across different e-commerce platforms.

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Exploring Culture and Sustainability: Community Participation in Indigenous Tourism in Malaysia

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Abstract: Nowadays, Indigenous tourism contributes to the conservation of cultural heritage and further supports sustainable development for Indigenous communities, which ultimately increases socio-economic well-being. By providing unique cultural experiences, Indigenous tourism gives greater recognition and respect for the culture while also economically benefiting. This paper aims to examine how such dynamics operate in the context of Indigenous tourism from the viewpoint and experiences of Indigenous community members who participated in tourism initiatives. Identifying culture as one of the crucial parameters that determine successful outcomes in this field, this study intends to explore how people participate in sustainable development through tourism and close important gaps using a cultural lens. Numerous databases containing scholarly research, including the Emerald Insights, Science Direct, and Web of Science, have been used in this study. As a response to the ever-growing call for inclusive and respectful tourism, this study aims to contribute valuable insights and geographical relevance to defining policy change, practice modifications, or academic pursuits of Indigenous tourism. The result of this study will fill crucial empirical research gaps in terms of how cultural restoration, tourism management, and community participation can be optimized for sustainable development with nuanced voices that are necessary to drive policy change as well as practice modifications.

Keywords: *Indigenous Tourism, Community Participation, Sustainability, Tourism Management, Culture.*

1. Introduction and Background

According to Tourism Malaysia (2023), tourism plays a critical role in bolstering Malaysia's economy, with the industry contributing RM28,228.3 million in 2022. Hamid et al. (2022) emphasized that the 12th Malaysia Plan supports this by enhancing economic opportunities for various communities, including Indigenous populations. Designating tourism as a National Key Economic Activity (NKEA) opens doors for rural and Indigenous tourism, which is increasingly popular worldwide for showcasing unique cultural heritage.

Indigenous populations form a substantial and varied demographic segment globally, covering an extensive spectrum of ethnic, cultural, and linguistic backgrounds. According to the United Nations (2023), there are 476 million Indigenous individuals worldwide, accounting for 6.2% of the total global population. These communities are distributed over 90 countries and encompass more than 5,000 distinct groups. Such diversity manifests in a rich tapestry of cultures, religions, traditions, languages, and histories (Bruchac, 2020). The widespread presence and cultural depth of these Indigenous groups highlight the intricacy of their roles and contributions within society, underscoring the importance of recognizing this diversity for understanding their unique viewpoints and effectively addressing the challenges they encounter today.

In Malaysia, the Department of Orang Asli Development (2022) identified three main categories of Indigenous populations in Peninsular Malaysia: The Senoi, Negrito, and Proto-Malay. The total Indigenous population in this region is reported to be 209,575 individuals, with the Senoi tribe being the most populous, accounting for 115,712 individuals or 55.21% of the Indigenous total. The Proto-Malay group follows with 87,541 individuals or 41.77%, while the Negrito, the smallest group, comprises 6,322 individuals or 3.02%. This characteristic, where a few groups constitute a major portion of the Indigenous demographic, echoes trends observed globally, similar to Canada such as First Nations, Métis, and Inuit populations, as reported in 2021 (Statistics Canada, 2024).

Indigenous tourism has been attracting a lot of focus in the wider tourism business, which means that many are becoming more involved with Indigenous as well (Butler, 2021). This heightened involvement marks their

participation in steering and leveraging wider tourism and economic developments. Despite the potential for social and economic benefits, Indigenous tourism remains marred with challenges related to understanding how culture informs community participation (Fan et al., 2020), which ultimately determines sustainable development outcomes (Matatolu, 2020). This study aims to understand the complexities of Indigenous tourism, focusing on how culture and sustainability impact community commitment and link with performance outcomes from tourism activities within an Indigenous context.

Indigenous communities worldwide are on the rise in interacting with tourism, and thus there is an urgent necessity to improve its power of preserving or making a gain out of their cultural heritage (Alamineh et al., 2023) while respecting them as well. Indigenous tourism can provide pathways to economic development as well as cultural renewal, but it also raises questions about what is considered authentic and how indigeneity should be represented amid settler colonialism. This ethnographic study of the culture and sustainability underlying Indigenous tourism is intended to make a scholarly contribution toward more socially inclusive and equitable forms of tourism practice for both Indigenous communities and the overarching sector.

Tourism has been popularly acknowledged as an effective economic growth driver from the perspective of Indigenous communities (Mansor et al., 2019). As highlighted by Mansor et al. (2019), tourism development includes the participation of the Indigenous community, contributing to transformational impacts on socio-cultural aspects. Their participation not only helps to maintain economic opportunities but also benefits the survival and perpetuation of ancestral culture, which therefore strengthens community resilience to socio-economic transformations. There are some ways in which Indigenous communities have negotiated the changes associated with tourism development and found a balance between accommodation for and benefiting from it (Scheyvens et al., 2021). The focus of sustainable tourism planning and research on tourist impacts is concerns over attitudes and perceptions by Indigenous communities.

Therefore, this study seeks to explore the perceptions and outlooks of Indigenous communities on tourism development to shape these findings for sustainable policy measures as well as future inquiry into understanding sustainability implications through an Indigenous perspective. Specifically, the objectives of this study are:

- To evaluate the cultural aspects of Indigenous community participation in promoting tourism initiatives.
- To investigate the effect of culture on the success and sustainability of Indigenous tourism initiatives.
- To analyze the Indigenous tourism strategies towards enhancing the sustainability of cultural awareness and sustainable tourism practices.

To achieve the above objectives, this study intends to answer the following research questions:

- What are the aspects of promoting tourism initiatives about cultural considerations in terms of involving Indigenous communities?
- What kind of cultural factors may contribute to or detract from the success and sustainability of Indigenous tourism initiatives?
- What are the Indigenous tourism strategies that can be applied to enhance the sustainability of cultural awareness and sustainable tourism practices?

2. Literature Review

Indigenous Tourism

The concept of Indigenous tourism has been identified as a critical area that may mediate cultural preservation, economic development and social justice among Indigenous communities. Indigenous tourism activities are generally related to the appreciation of nature, participation in local practices and immersion into cultural experiences that lead to increased overall happiness (Wu et al., 2020). Wei et al. (2021) have pointed to the potential of thinking about Indigenous people as just another group of tourists for advancing deeper frameworks that could understand indigeneity and explain the meaning of indigenization. This perspective is intended to contribute to a theoretical understanding of the trans-local constitution of indigeneity by

emphasizing complexity beyond any singular identity categories that can be subsumed within Indigenous communities. It recognizes Indigenous people as other tourists, in search of meaningful experiences that reflect who they are and what they want to become, thus complicating the rather fixed representations of Indigenous people and their cultures. This approach helps in presenting Indigenous tourism as a favorable approach that not only acknowledges the modernity and globalization in Indigenous peoples' communities.

According to Dahlan et al. (2023), Indigenous tourism can play a much bigger role in improving socio-economic conditions for people by providing jobs and keeping land and infrastructure well maintained as assets to local economies, all the while bolstering pride among those who are involved. However, it poses complex issues in maintaining cultural identity and an efficient local administration at the same time. For instance, the arrival of tourists tends to create consumerization of cultures, which may in turn reduce the importance and meaning behind various practices. This underlines the need for Malaysia to fine-tune its management approaches that would enhance the conservation-usage balance that the people had adopted on cultural resources in their bid to develop profitable tourism products without compromising on culture.

Even though roles in employment and economic development of Indigenous people have moved beyond the traditional forms, Butler (2021) argued that future studies must explore further the economic development dimensions, which appear to have changed with the new motivation and expansion of tourism activities. For example, Butler (2021) mentioned that in the course of the growing complexity of Indigenous tourism businesses, the parties can intensify the discussion regarding the increased tourist flows' management and the expansion of the types of tourism offerings. Raja et al. (2022) also highlighted that Indigenous tourism in Madhya Pradesh, India, requires an integrated approach relating to human resources, social capacities, concerns for nature and heritage, engagement of Indigenous communities, and marketing of local products. Thus, there is balance and fairness in the distribution of the impact of tourist activities within the community and, at the same time, it guarantees that the said activities will adhere to the community's ideals and standards.

Self-identifications presented by Indigenous people on tourism platforms are diametrically opposite to the non-Indigenous tourists' landscapes hence reaffirming Indigenous identity as well as acknowledging the authority of cultural heritage managers (Ambros & Buzinde, 2021). Such self-representations are valuable assets for Indigenous people in their way of controlling the discursive field and providing truthful information to tourists about their cultures. Thus, through Indigenous cultures' presentation of their cultural terms, Indigenous communities can effectively work against stereotyping and mediate a proper and more appropriately engaging interaction with the tourists.

Moreover, Chen (2021) sought to improve the significance of Indigenous tourism in a multicultural segmented market by matching the tourists' expectations and experiences. This means in the process of constructing tourism products, emphasis should be placed on the creation of products with real cultural content that will at the same time meet the desires of different tourist groups. In this way, Chen (2021) wanted to promote sustainable tourism that will help in the development of the economy while paying respect to the local culture. Therefore, this approach emphasizes the importance of culture and sustainability in the existence of tourism development planning.

Indigenous Community Participation

Today, Indigenous community participation is incorporated into sustainable development, environmental management, and cultural conservation frameworks. Thompson et al., (2020) in their paper highlighted that a higher level of Indigenous community participation in environmental monitoring indicates that they have different monitoring goals, measures, and results compared to the cases with lower Indigenous community participation. This discovery revealed that Indigenous people contribute valuable 'epistemic resources' to enhance processes of environmental development by offering their valuable Indigenous knowledge and principles within these programs. For instance, Bullock et al. (2020) illustrated how Indigenous participation in collaborative environmental governance in Canada, initiated by NGOs, can be effectively enhanced through four specific participation structures: In the first category, there are external advisory committees, the second category is internal board subcommittees, the third category is hybrid internal-external advisory boards and in the last category there still internal ad hoc groups, but their members are selected from internal resources.

These structures create a more appropriate and proper way of involving these Indigenous people so that they are not left out of governance systems.

Drake et al. (2022) performed a scoping review of the literature on Indigenous participation in carrying out coastal and marine research and monitoring in Inuit Nunangat, Canada. Hence, it is evident that there is a significant gap in the definition and measurement of participation as demonstrated by articles published in the scientific journals. The qualitative analysis of 72 works revealed that only 10 percent of the sources provided distinct definitions for participation terms aggravating a severe absence of coherence in the literature and the subsequent requirement for the more distinct definitions of the participation terms. This can cause a breakdown in the effectiveness of participatory approaches, significant to the enhancement of culture such as definition and structure for enabled Indigenous groups participation. They include theoretical and methodological issues arising from the fact that important definitions, which are fundamental tools for the operationalization of the concept of participation concerning Indigenous stakeholders' input and needs, are unclear and inconsistent.

Musadad et al. (2022) discussed about tourism participation of the Indigenous community in the context of Bukit Tigapuluh National Park, Indonesia. Consequently, the study found that explaining Indigenous participation in tourism activities, there is a positive relationship with set conservation goals, forest management as well as improvement of the community because they are positively impacting activities. As demonstrated in this case, the incorporation of Indigenous people leads to sustainable tourism as an effort an expand the sector that is socially and economically beneficial to the environment and Indigenous persons. Therefore, this study has highlighted that Indigenous people in the area of Bukit Tigapuluh have effectively achieved the link of sustainable economic activities with conservation and cultural sustainability goals. The positive impacts that the community perceives are increased concern for the environment, local people's additional income, and cultural heritage marketing.

Sustainable Development

The Indigenous peoples' right to sustainable development has been labeled as a "cornerstone" of modern policy agendas as a reflection of self-determination as well as the need to diversify support instruments (Nikitin, 2022). This principle postulates that Indigenous people should have control over their affairs and be involved in any decisions concerning their physical space, assets, and culture. The measures related to sustainable development policies have to involve Indigenous people, providing them with the opportunity to determine their further development. This empowerment includes the promotion of their autonomy as well as providing an adequate accompaniment of their projects and proper legislation. In this way, policies can make almost any initiative not only sustainable but also more sensitive to equity and inclusion.

There are issues like the protection of land rights, the appropriate estimation of the tourists' demand, and the management structures that should be supported to ensure the sustainability of Indigenous people's tourism within protected areas (Mach & Vahradian, 2019). The secure land rights offer flexibility to the Indigenous people and their communities to steward their land resources using their Indigenous practices and the principles of sustainability. The correct estimation of tourist' demand is useful to further coordinate and control tourism-related actions to prevent excessive overcrowding that results in negative impacts on the environment and traditional culture. Participatory management approaches with communities, national and local governments and other stakeholders ensure that measures of tourism development and promotion are premised on benefitting the communities and their values hence; promoting the shared stewardship of resources.

Thus, Indigenous tourism in the forested area targets sustainability goals that require the engagement of both the community people and administrative bodies. Salazar-Sepúlveda et al. (2022) offered a massive systematic review that figured out the features of sustainable tourism including limiting the number of tourists, bringing adequate infrastructures, and enforcing conservative measures. They also call for measures for the controlling number of tourists with a view of avoiding exploitation of natural resources by many people. Moreover, they call for adequate infrastructure that may include environmentally friendly products, especially tourism-related products like accommodation units that will have the least impact on the environment. Conservation also forms another important pillar of tourism because, through the conservation of habitats and species, the balance of nature should be preserved to avoid the negative impact of tourism activities.

Similarly, Chang et al. (2021) warned that Indigenous tourism should try to reach sustainability by adopting supportive government policies and pursuing the benefits related to business, people, and the environment. There is often a need for government support for entering and maintaining active participation and the necessary funding and investment as well as adequate policies that support Indigenous people and their sustainable needs. In addition, government support refers to the direct and indirect funding of community-based tourism initiatives, skills development interventions that strengthen the local human capital and policies that support Indigenous peoples' justice and sustainable ecotourism. When implemented, such initiatives can generate employment and income for the Indigenous people hence, improving the economic effects of the policy. From the social aspect, they may bring about unity of the people as well as a boost to cultural personality while from the environmental aspect, they can extend support towards the preservation of the natural base as well as the species.

Maza and Calfucura (2020) provided a critical insight into the policies on tourism development in Chile, and South America: on the one hand, Indigenous tourism and on the other, Indigenous people's political representation. Such disparities show that while approved policies seek to stimulate tourism, there is a vacuum as regards the political and social rights of indigenous people. Failure to be granted political identity and support, Indigenous tourism ventures may experience the above difficulties like inadequate funding, poor infrastructure, and inadequate marketing. To overcome it, they call for the political and cultural rights of Indigenous people to be respected in the process of tourism improvement. This includes addressing past wrongs done to them, affording legal status to their territories and natural endowments, and encouraging Indigenous people's inclusion in tourism management.

Sustainable Indigenous tourism development must hence involve processes of building Indigenous pride, the retention of Indigenous knowledge, and partnership with the tourism sector partners as evident at the Pha Mi Indigenous Tourism in Chiang Rai, Thailand (Yiamjanya et al., 2022). These measures help minimize cases of cultural misunderstandings and scenarios where Indigenous populations end up being disadvantaged by tourism development. This intervention has positively incorporated cultural values and cultural practices in tourism-related activities making the experience real to the tourists. This has gone a long way in generating pride among the Pha Mi community members concerning their culture and history to undertake the responsibility of passing down this information to the next generations. Collaboration with tourism partners like local traders, the government and non-governmental organizations has also been essential in getting all the support necessary to come up with sustainable tourism that will benefit the society both economically and socially.

Some Indigenous tourism enterprises in Fiji, Australia, and New Zealand use appropriate strategies of sustainable tourism management based on Indigenous philosophies and practices (Scheyvens et al., 2021). These enterprises are twofold as they help other Indigenous & non-Indigenous people to understand cultural differences, assist in developing local businesses, and improve the environment in which they exist. For instance, in Fiji, tourism enterprises offer cultural tourism working with local people to organize cultural tourism packages and ecotourism accommodations that depict the cultural practices and lifestyle of Indigenous Fijians. Australia's Indigenous tourism enterprises provide services like guided tours through which people are explained about the region's geography, fauna, and the Indigenous culture. In New Zealand, owning to the tourism ventures owned by Māori, various activities have been developed that have the aim of introducing Māori culture, history and way of life to the tourists. These enterprises act as successful templates for sustainable development pointing at how Indigenous people's support through tourism can be attained concurrently with cultural exchange and conservation of natural resources.

Culture

Culture is one of the factors that may or may not help in the nourishment and enhancement of Indigenous tourism. Indigenous tourism functions as a channel through which Indigenous people and their traditions signifying languages, history, chants, art, movements, ways of hunting, celebrations, and rules can be preserved. However, the problems are with the navigational practices of individuals and communities who own cultural assets and representations. These issues have been mentioned by Ruhanen and Whitford (2019) concerning Indigenous tourism or cultural tourism as they support the maintenance of cultural identification but, it must

be recognized and dealt with depending on its case so that Indigenous culture will not turn into another product that is for sale. The acute issue lies in the fact that only the Indigenous communities have to be supported with their potential to manage their intangible heritage unsuitably for external demand that functions predominantly in the sphere of standardized global tourism.

Even though tourism is generally frowned upon since it brings confusion to their culture, the Indigenous people of the Tz'utujil Maya Community, specifically the people of Santiago Atitlán, Guatemala, have proven that in as much as tourism poses many challenges to Indigenous communities, it equally can be used to empower them by embracing their cultural beliefs. Harbor and Hunt (2021) explained in detail how this model increases, for example, self-governance, self-determination, and equity concerning tourism-related issues. Their research presents insights into how the Tz'utujil Maya try to redress some of the improper uses of their culture such as in tourism activities. There is no passive acceptance of cultural depictions, but rather the negotiation of culture production about authenticity and representation, which determines how the participants' culture ends up in tourism circulation. This process entails an ongoing discussion in the community on the kind of cultural portrayal that is acceptable for the dissemination of their culture to the outside world while at the same time satisfying the tourism market.

Suggesting some examples in Malaysia, the Mah Meri tribe failed to become assimilated into tourism by integrating their cultural assets including wood carving, the carving of masks, the weaving of pandanus, cultural dances, and other performances into their tourism package. Some of the exposure to the Mah Meri culture was acknowledged by Wahab et al. (2020) as partly owed to the intervention of the involved tourism authorities. These authorities also assist the tribe, to oversee the preservation of the true nature of the cultural practices in their midst and also in advertising the specialty of these practices. It is the double vision that would guarantee that the Mah Meri would not be deprived of the economic advantages that come from tourism while at the same time remaining culturally intact. Tourism authorities also support the process and contribute resources, training, and marketing to guarantee the sustainability, and profitability of the Mah Meri's cultural tourism activities.

As another example, the Batek tribe of Malaysia struggles with the need to preserve their cultural integrity and develop tourism services at the same time. Fan et al. (2020) discussed various dilemmas concerning the process of modernization that the Batek tribe faces as well as their attempts to maintain their cultural identity. Thus, the Batek face the problem of how to realize tourism without risking domination over their history and culture. This struggle is emblematic of a broader issue faced by many Indigenous communities, where they have to find ways to effectively use tourism as a source of income, while at the same time preserving the cultures of the peoples that live in those areas.

While analyzing the cultural aspect in the tourism context, Indonesian interpretation tends to define cultural elements in terms of identification and tourism attractiveness without emphasizing the value of culture as an economic asset. According to Mangku et al. (2022), this narrow aim is problematic because it does not mention the overall endogenous economic impacts that could be created if there is a more collaborative approach to cultural tourism. Based on their findings, culture could be seen as an economic capital meaning that the promotion of tourism should be done in a way that will foster cultural tourism that will promote the establishment of economic opportunities in Indigenous communities. This course of action implies a different way of thinking and perceiving, where cultural heritage has to cease to be looked at as a mere sightseeing spot, but, as a living and beneficial economic resource.

3. Methodology

The systematic literature review (SLR) concluded from this study provided the following results that correspond with the research objectives revolving around Indigenous tourism, community participation, and sustainability. The steps involved in the review process were asserting different databases including Emerald Insight, Science Direct, and Web of Science, which was done based on their database of peer-reviewed journals ascertaining its availability of material. In total, 23 articles were scrutinized, which entails the presence of a solid base for the discussion concerning this study. One of the recurring topics to be discussed is the participation of Indigenous community members in the destinations. In doing so, this participation improves

the reality of the tourists' experiences and exemplifies the implementation of sustainable practices that align with cultural and environmental preservation.

Furthermore, in the course of the review, several successful sustainable practices geared towards culture conservation with equal concern for the environment when contrasting economic gains and cultural values were also witnessed. Another area of learning was the economic outcomes of Indigenous tourism, highlighted by surveys that showed that community participation results in improved revenues and employment for the Indigenous people hence serving the purpose of the research which aimed at gauging such returns. Nevertheless, literature also revealed some of the key issues of Indigenous populations, such as scarcity of resources, prejudice, and influence of non-Indigenous tourism actors, which are essential to analyze the multifaceted nature of Indigenous tourism. In addition, emerged more pronounced knowledge gaps, especially those associated with the long-term impacts of Indigenous tourism on culture and community resilience. These insights not only give an overview of the state of knowledge of Indigenous tourism but also suggest the future of this study, thus staying in tune with the scholarly literature while addressing the challenges and gaps identified.

To perform this study, a set of specific keywords was used in the search strategy that would encompass the whole idea of the study. The primary keywords were "indigenous tourism" and compound keywords, which consisted of "indigenous AND tourism," which aimed to search for information about the specialized characteristics of tourism related to Indigenous peoples. In more detail, to expand the focus on the dynamics of local engagement identified in the literature, the study also used "indigenous community participation," and "indigenous AND community participation." Consequently, the search allowed for the consideration of the Indigenous people's participation in tourism activities.

Apart from the keywords on community participation, other keywords used in the review were connected to sustainability and tourism management to capture the research that analyses the sustainability of practices applied in Indigenous communities concerning tourism. The addition of the word "Indigenous" and the blend of two words "Indigenous AND culture" enabled the research to connect with works that address survival, transformation, and the consequences of cultural assets resulting from tourism advancement.

By employing these keywords, the literature search was conducted to construct a strong notion of how Indigenous tourism works, how it impacts and incorporates Indigenous communities, and finally, how impediments towards sustainable Indigenous tourism can be conquered. The findings from these databases were similarly diverse as they included work with theoretical discussion, case studies, and empirical research findings that collectively offered the basis for analysis in this study.

4. Potential Outcome and Direction for Future Research

The objective of this study is to provide a deep analysis of the cultural and sustainable intervention in Indigenous tourism in Malaysia. It is equally important to identify the expected impacts since the goals are multiple, complex, and highly important. In the first place, it is believed that this paper will elucidate the roles of cultural artifacts, including practices, arts, and communal activities as critical determinants of elusive Indigenous tourism development. Thus, it will expose how cultural values are central to tourism operations as a means of generating remarkable economic returns to the Indigenous people's societies (Wahab et al., 2020). Furthermore, the study will yield important findings concerning the degree and type of community participation in tourism activities, stressing positive incentives and negative restraints on participation. Through the assessment of existing community-centered tourism development initiatives, the research shall present examples, which shall inform the implementation of similar contexts among Indigenous communities (Mansor et al., 2019).

Moreover, the research seeks to find out how sustainability is understood and practiced in Indigenous tourism, and perhaps more distinctive, how the development and conservation of Indigenous cultures interrelate. It will be possible to discover the vital long-term success of sustainable activities, for instance, the environmental management within tourism and culturally sound advertisements (Ransfield & Reichenberger, 2021). Last but not least, this study is ready to provide strong policy implications for governments, tourism authorities, and

Indigenous communities regarding the support of Indigenous tourism initiatives and business models in such a way that the Indigenous people's culture and values will be respected while the economic growth will be achieved. Useful recommendations will be made to ensure that tourism operators and community leaders implement and improve the efficiency and sustainability of their interventions (Dahlan et al., 2023).

In addition, there are some suggestions for potential future studies to improve the conceptualization of Indigenous tourism. Firstly, the longitudinal study is important to cover the Indigenous tourism projects' developments over several years to determine their sustainability and cultural imprinting. Exploring the external environment that affects Indigenous tourism initiatives' ability to be successful and sustainable will also be necessary (Simpong et al., 2022). A comparative study of the progress of Indigenous tourism efforts at the regional and international level within Malaysia will enable researchers to find out common success promoters and contextualized challenges facing the success of Indigenous tourism initiatives. Comparing and analyzing how different Indigenous populations change their setting up of tourism with regards to culture or environment will therefore lead to a better understanding of the possibilities and viability of such initiatives (Scheyvens et al., 2021).

Furthermore, how social media and technology, in general, can be used to boost Indigenous tourism and maintain cultural integrity at the same time, can also present new approaches to enrich the tourists' experience and safeguard the Indigenous peoples' identities (Choo & Halim, 2022). Targeted economic analysis research is essential to measure the constituent value of Indigenous tourism to analyze how possible revenues are fairly divided. The professionals will also have to devise mitigation measures that will enable them to effectively address global issues, for instance, pandemics or economic downturns, when evaluating the economic sustainability of Indigenous tourism initiatives (Sanip & Mustapha, 2020).

The participation of anthropologists, environmental scientists, economists and culture specialists from other fields will enhance the growth of an inter-disciplinary kind of approach towards Indigenous tourism. Indigenous people's participation in the formulation of research topics and approaches is particularly crucial owing to the primary consideration of Indigenous ways of knowing (Aisyah, 2023). Finally, future research may focus on an examination of the processes by which the policy recommendations resulting from this type of study are put into practice, as well as assess the utility and outcomes of those initiatives on Indigenous tourism. Understanding the factors that may hinder the policies' implementation and recommending ways to effectively improve the policies' approval by the governments and other stakeholders will help to adopt policies that will be efficient and beneficial for Indigenous people. As highlighted in the literature gaps above, future research focusing on these areas will enhance the understanding and improvement of Indigenous tourism for the future development of Indigenous people's culture in Malaysia and other parts of the world.

5. Conclusion

Overall, this paper is capable of providing a clear understanding of the complexity of culture, community participation, and sustainability in tourism activities for the Indigenous peoples in Malaysia. Thus, the present research underscores the concept and significance of culture and participation of the Indigenous people as vital ingredients to implement sustainable measures in tourism practices. Therefore, this study also points to the importance of the centering of the Indigenous paradigm to affirm and protect Indigenous peoples' sovereignty and cultural assets in tourism. It ensures that economic development does not compromise on cultural principles. This paper also confirms that; tourism plans, that respect cultural values and remain sensitive to the historical background of Indigenous people and artifacts are critical to achieving sustainable development.

As Indigenous tourism is entering the global sphere of attention the findings of this research contribute to understanding what policy improvements are necessary for Indigenous peoples, aiding in the development of effective recommendations and practices, and contributing to further Indigenous tourism research. Subsequently, population and cultural specifics related to Indigenous peoples can be one of the prerequisites for applying comprehensive strategies for sustainable Indigenous people's tourism. It is, therefore, the modest endeavor of this study to add its voice to the global discourse on sustainable tourism, especially given the fact that methods and approaches empowering the Indigenous knowledge, values and culture are imperative for sustainable development. Finally, this paper argues for the improvement of Indigenous tourists' treatment that

allows Indigenous populations to protect and promote Indigenous cultures and provide sustainable income-generating activities for Indigenous people. Instead, it embraces the need to fundamentally change the tourism development paradigms in such a way that Indigenous people's voices and experiences as custodians of vibrant cultures are accorded primacy and protection within the global tourism domain.

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The Impact of Social Media on Mental Health of Young Adults: A Literature Review

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Abstract: This concept paper explores the complex relationship between social media usage and the mental health of young adults. The paper introduces the notion of social media and its significance in the lives of young adult, emphasizing the importance of studying its effects on their mental health and psychological well-being. Social media platforms have become an integral part of daily activities in the lives of young people. It has also become an invasive element in the lives of youth, shaping their social interactions, self-perception, and access to lots of information. Even though these platforms offer opportunities for social connection, creative expression, and educational engagement, they also present significant mental health challenges, including anxiety, depression, and low self-esteem, which are often driven by social comparison, cyberbullying, and the pressure to maintain an idealized online image. The paper investigates key areas of concern, including the rise of anxiety, depression, and low self-esteem linked to social comparison, cyberbullying, and the relentless pursuit of online validation. It also examines the addictive nature of social media, its impact on sleep, and the destruction of face-to-face social skills. By analysing existing literature and identifying research gaps, this paper aims to provide a comprehensive framework for understanding the two-edged nature of social media's influence on mental health. It advocates for the development of digital literacy programs, mental health support systems, and balanced usage strategies to help young people navigate the challenges posed by social media while maximizing its potential benefits.

Keywords: *Social media, Trends, Mental Health, cyberbullying, Social Participation, Social Comparison, Self-Presentation, Young Adults*

1. Introduction and Background

The rapid rise of social media (formerly referred to as social network sites) has profoundly transformed the social landscape for young adults, who are among the most active users of these platforms. Social media, as defined by Carr and Hayes (2015), refers to online platforms that facilitate interactions through sharing pictures, comments, and reactions to content. With many teenagers being regular users of social media (Anderson & Jiang, 2018), understanding its impact on their mental health is crucial. Young adults, typically aged 18 to 30, are the most users of social media, with studies showing that they spend substantial amounts of time on these platforms daily (Pew Research Center, 2021). Social media provides avenues for social interaction, information sharing, and entertainment, aligning with the developmental needs of young adults who are navigating major life transitions such as completing education, starting careers, and forming intimate relationships. Social media has redefined how they interact, communicate, and perceive themselves and others. The Internet Users Survey 2020 undertaken by the Malaysian Communications and Multimedia Commission (MCMC) showed that Internet users in the country were mainly adults aged between 20-29, accounting for 46%. This makes youth aged between 20-24, the biggest group of internet users in Malaysia (MCMC, 2020). The national survey revealed that people used the internet for text communication (98.1% of respondents), social media (93.3%), to watch videos (87.3%), voice/video communication (81.1%) and to get information (74.3%). 43% of internet users had shared online content. In 2023, Malaysia had approximately 30.25 million active social media users.

Representing about 91% of the country's total population of around 33.57 million people. Social media platforms such as Facebook, Instagram, TikTok, and Twitter are particularly popular among Malaysians, with a significant portion of the population using these platforms daily for communication, entertainment, news, and commerce. This high level of social media penetration reflects the growing importance of digital platforms in the everyday lives of Malaysians. Thus, this paper discusses the imperative areas that revolve the social media and its impacts on users such as the emerging trends of social media use, its implications on mental health, social participation and social behaviour, identity formation and self-representation and regulatory enforcement of social media in Malaysia.

Social media platforms such as Facebook, Instagram, Twitter or X, and TikTok, have evolved rapidly over the past decade. These platforms offer users the ability to share content, engage with others, and participate in virtual communities. For young adults, social media serves as a primary means of communication and self-expression, playing a central role in their social lives and identity formation. This paper also clarifies the key term 'psychological wellbeing,' which described by Waterman et al. (2010), relates to an individual's ability to live meaningfully according to their deeply held values. According to the World Health Organization (WHO, 2018), mental health is defined as a state of well-being where an individual can flourish by realizing their potential, engaging in positive social interactions, and contributing to society. Although existing research in this area has been mainly quantitative, providing evidence for the association between social media use and mental health outcomes, it has offered limited insight into how young adults perceive and experience these effects. To address this gap, this paper introduces a narrative review that aims to synthesize recent qualitative research focusing on young adults' perspectives regarding the impact of social media on their mental health and psychological well-being. This approach seeks to deepen the understanding of how social media influences the lives of young people from their viewpoints, offering valuable insights beyond what quantitative data can provide.

With sorts of social media platforms, young adults have unparalleled access to global networks, enabling them to stay connected with peers, share experiences, and access diverse information. However, this digital shift has also introduced new challenges that affect their mental health and social participation. Young adulthood is a critical developmental stage characterized by significant emotional, psychological, and social changes. During this period, individuals are particularly sensitive to external influences, including peer approval and social feedback, both of which are magnified in the context of social media. Recent studies confirm that identity formation continues throughout young adulthood, influenced by personal experiences and social interactions (Downes & Kim, 2019). Other than that, the need for social validation, often measured through likes, comments, and followers, can foster a sense of self-worth that is contingent on external approval, further worsening mental health issues. The pressure to maintain an idealized online image, combined with constant exposure to curated portrayals of others' lives, can contribute to feelings of inadequacy, anxiety, and depression. The phenomenon of social comparison where young adults measure their worth against the unrealistic standards set by their peers and influencers can intensify these mental health issues.

Cyberbullying is another significant concern associated with social media use. Unlike traditional bullying, cyberbullying can occur at any time, 24/7, with the potential for wide and rapid dissemination, making it more pervasive and damaging (Alim, 2016). Victims of cyberbullying are at increased risk of experiencing anxiety, depression, and even suicidal thoughts. Furthermore, the anonymous nature of online interactions can lead to a lack of accountability, making it easier for bullies to target their victims. Social media also impacts young adults' social participation. While these platforms offer opportunities for community building and activism, they can also lead to social isolation and a decrease in face-to-face interactions. The reliance on virtual communication can weaken real-world social skills, making it difficult for young adults to form and maintain meaningful relationships outside the digital realm. Moreover, the constant connectivity associated with social media can disrupt sleep patterns, further affecting young adults' mental health and social functioning (Nesi, 2024). Despite these challenges, social media is not without its benefits. It can provide a sense of belonging,

Particularly for those who may feel marginalized in their offline communities. Online support networks can be invaluable for young adults dealing with issues such as mental health struggles, identity exploration, or social stigma. Additionally, social media can be a platform for positive self-expression, creativity, and civic engagement, allowing young adults to connect with like-minded individuals and causes they care about.

In addition to these psychological impacts, social media has also reshaped the way young adults participate in social life. Social media has fundamentally transformed how young adults lead their social lives, influencing everything from interpersonal relationships and social interactions to identity formation and community engagement. In other words, social media has reshaped the social landscape for young adults, offering new opportunities for connection and expression while also introducing complexities and challenges that influence their social experiences and mental well-being. The multidimensional social media platforms offer avenues for building connections and engaging in community activities, they can also lead to social isolation, reduced face-to-face interactions, and an over-reliance on virtual relationships. This can distort their perception of

what is normal or achievable, leading to dissatisfaction with their own lives and increased pressure to conform to these ideals (Chou & Edge, 2012). The constant exposure to idealised and often unattainable standards on social media can create unrealistic benchmarks for success and happiness. As a result, individuals may feel inadequate or pressured to align their lives with these portrayed ideals, which can intensify feelings of dissatisfaction and contribute to a range of psychological issues, such as anxiety or nervousness, depression, and low self-esteem.

The digital environment, with its relentless pace and the potential for negative interactions such as cyberbullying, can create stressors that undermine mental well-being. Despite the potential risks, social media also offers significant benefits, including access to support networks, educational resources, and opportunities for creative expression. For many young adults, these platforms provide a sense of belonging and a means to connect with like-minded individuals, particularly those who may feel marginalized in their offline lives. Understanding the impact of social media on the mental health of young adults is crucial for developing strategies that promote healthy online behaviours and support mental well-being (Zhao, Da & Yan, 2020). As social media continues to evolve and embed itself in the composition of young adults' lives, it is essential to address the complex ways it influences their mental health and social participation. This exploration will provide insights into how to balance the advantages of social media with the need to mitigate its potential harms, ensuring that young adults can navigate the digital world in a way that supports their overall well-being.

In summary, recent literature features on new trends and developments in social media use, focusing on its impact on mental health, social behaviour, and societal issues, while social media presents unique opportunities for young adults to engage with the world, it also poses significant risks to their mental health and social development. Understanding the dual impact of social media use on this critical age group is crucial for developing interventions that promote healthy online behaviours and support young adults in navigating the complexities of the digital world.

2. Literature Review

Emerging Trends in Social Media Use

The field of social media research has rapidly evolved, reflecting the dynamic nature of digital platforms and their growing influence on various aspects of life. Recent literature highlights the evolving impact of social media on the social lives of young adults, emphasizing both the transformative effects and emerging challenges. The digital landscape continues to shape how young adults connect, communicate, and construct their social identities, with new trends and technologies influencing these processes. Several studies have examined the patterns of social media use among different age groups, particularly young adults. The latest research underscores the role of social media in expanding social networks beyond geographical boundaries. Young adults are now able to form and maintain relationships with peers across the globe, creating diverse and multicultural social networks (Boulianne & Lee, 2022).

The concept of hybrid socialization, where online and offline interactions blend seamlessly, is gaining more attention. Young adults increasingly navigate both worlds simultaneously, with social media enhancing face-to-face interactions through pre-event planning, post-event sharing, and continuous engagement with social circles (Robards & Lincoln, 2020). Global connectivity fosters cross-cultural exchange and broadens social perspectives. Research indicates that young adults engage with social media frequently, often using multiple platforms to fulfil various needs such as social interaction, entertainment, and information consumption (Smith & Duggan, 2013). Patterns of use are influenced by factors such as social norms, personal interests, and technological advancements (Myrow, 2024). Social media use has been escalated and integrated into many areas in recent years. Social media is becoming more incorporated into daily activities, including work and education. The rise of remote work and online learning has increased the use of social media for professional networking and educational purposes (Trunfio & Rossi, 2021). The concern about keeping the privacy has also created with growing awareness of data privacy issues, users are becoming more concerned about how their information is collected and used. Recent studies explore the impact of privacy policies and data breaches on user trust and engagement (Martin & Murphy, 2017). Studies emphasize the importance of giving users control over their data. Features that allow users to manage their privacy settings and understand the implications of

their choices contribute to greater trust and satisfaction. Providing users with control and autonomy over their information can enhance their overall engagement with the platform.

In terms of frequency and duration of social media use, young adults typically spend significant time on social media, with some studies reporting daily usage exceeding several hours (Vogel et al., 2014). The time spent on these platforms can vary based on individual preferences and the types of content consumed. Other than that, the purpose of use has also significantly emerged in the trend. According to Boyd and Ellison (2007), social media use among young adults serves multiple purposes, including maintaining social connections, seeking social recognition and validation, and engaging in self-expression. The motivations behind use can influence the nature of interactions and the impact on mental well-being. Platforms like Facebook, Instagram, and TikTok enable users to connect with people across the globe, facilitating cross-cultural exchanges and broadening social horizons (Ellison et al., 2021). These interactions not only expand social networks but also promote inclusivity and diversity, allowing young adults to engage with perspectives different from their own. Social media platforms are increasingly facilitating the creation of niche digital communities where young adults can engage with specific interests and identities. These communities, whether centred around hobbies, social causes, or shared experiences, offer a sense of belonging and validation that might be lacking in offline settings (Papacharissi et al., 2023). Recent studies have documented shifts in social media usage patterns, including the rise of new platforms and changes in user behaviour. The shift in social media usage is likely due to the emergence of platform diversification. The landscape of social media continues to diversify with the emergence of new platforms like TikTok and the evolving features of existing ones. Research indicates that younger demographics are increasingly gravitating towards platforms that offer short-form video content and interactive experiences (Anderson & Jiang, 2018).

Mental Health Implications

The relationship between social media use and mental health has been a major focus of research. While social media can offer support and connectivity, it is also associated with several negative mental health outcomes. The growing concern about mental health challenges among young adults has been discussed by many social media researchers, and the concern is particularly related to the impact of social media use per se. The data points out (WHO, 2020a, 2000b) that mental health issues increase prevalently among young adults, amounting to 16% of diseases in 10–19-year-olds. This number shows a significant portion of disease in young individuals, with social, emotional and psychological well-being being critical to their overall relationships and sense of belonging. According to a report by the CDC (2018), psychological well-being is also emphasized as essential for self-acceptance, personal growth, and effective coping strategies.

Numerous quantitative studies have established a clear link between social media use and various psychological problems, for instance, research by Keles et al. (2019) supports the association between social media use and increased rates of depression, anxiety or nervousness, and reduced self-esteem. Specific studies by Lin et al. (2016) and Dhir et al. (2018) underscore the rising rates of depression and anxiety linked to social media usage, whereas Woods and Scott (2016) focus on how social media can negatively impact self-esteem. All these studies suggest that while social media may offer some benefits, its potential to exacerbate mental health issues in young adults cannot be ignored. The findings call for a deeper understanding of the mechanisms behind these associations and the development of strategies to mitigate the negative effects of social media on young adults' mental health. In today's generation, many young people spend a significant amount of time on social media, often leading to prolonged periods online without breaks, which can result in insufficient sleep. According to Li et al. (2020), nearly 64.5% of young adults sleep less than 8 hours on weekdays. This lack of adequate sleep can disrupt their daily functioning and contribute to considerable personal distress, increasing the risk of psychiatric illnesses and engaging in risky behaviours such as drug abuse and dangerous driving. Sleep is crucial for long-term health and well-being; it plays a vital role in maintaining brain function, physical health, and cognitive abilities. Adequate sleep is essential for effective thinking, reaction, work performance, and learning, underscoring its importance in overall life quality.

Excessive social media use, particularly before bedtime, can significantly disrupt students' sleep cycles due to social media addiction and related negative habits. The screens of digital devices emit blue light, which interferes with the production of melatonin which is the hormone crucial for regulating sleep-wake cycles (Newsom & Singh, 2024). This disruption can lead to difficulties falling asleep, staying asleep, and achieving

restorative sleep. Consequently, students may experience sleep-related disorders, including excessive daytime sleepiness, which has become increasingly common among this demographic. The impact of these sleep disturbances underscores the need to address the relationship between social media use and sleep health. The article highlights that excessive social media use among young adults and students can lead to internet dependence, with behavioural and emotional functioning showing psychopathological risk characteristics (Kline, 2014). This overreliance on social media may cause symptoms of melancholy and anxiety, particularly when access to the internet is restricted. Consequently, excessive use of social media can result in internet addiction and psychological issues, including depression and anxiety. The constant nature of social media, operating 24/7, disrupts sleep cycles, contributing to exhaustion and inadequate rest. Many students report staying up late and scrolling through social media, which is associated with increased stress levels and decreased resilience. Promoting healthy digital behaviours is crucial for improving well-being and mitigating the negative impacts of excessive social media use.

There are studies which address the concerning link between exposure to harmful content on social media and the increased risk of psychological harm, self-harm, and suicidal ideation, particularly among vulnerable young users. Arendt et al. (2019) highlight the troubling association between viewing self-harm content on social media and its detrimental impact on mental health. Given the central role social media plays in the lives of teenagers, the potential for such exposure to cause significant psychological distress is especially alarming. The term "psychological harm" encompasses a range of negative emotional experiences, including feelings of being threatened, intimidated, and excluded by others. Yoo and Smetana (2019) emphasize that the effects of psychological harm are influenced by the specific context in which it occurs, as well as individual factors that either protect against or heighten vulnerability to such harm. These findings underline the importance of understanding the contextual and personal variables that contribute to the impact of social media on mental health, particularly in adolescents. Thus, the studies suggest a critical need for protective measures and interventions to safeguard vulnerable young people from the negative effects of harmful content encountered online.

Social comparison always happens due to the inferiority and insecurity of young adults. Social comparison theory, first introduced by Festinger (1954), explores how individuals evaluate themselves by comparing with others. This concept is particularly relevant in the context of social media, where platforms provide constant opportunities for users to engage in social comparison. Social comparison can be categorized into upward and downward comparisons. Upward comparisons involve comparing oneself to those perceived as superior, which can lead to feelings of inadequacy or inspiration depending on the context (Wood, 1989). Downward comparisons, where individuals compare themselves to those they perceive as worse off, may enhance self-esteem but can also foster complacency (Morse & Gergen, 1970). Research indicates that frequent upward social comparisons on social media are associated with lower self-esteem and higher levels of depression and anxiety. This is because users often encounter idealized portrayals of others' lives, which can lead to negative self-evaluations and dissatisfaction (Vogel et al., 2014). Conversely, downward comparisons may temporarily boost self-esteem but can contribute to a skewed perception of one's life satisfaction (Bergagna & Stefano, 2018). Studies have shown that exposure to idealized representations of others' lives on social media can lead to negative self-evaluations and increased feelings of inadequacy (Festinger, 1954). This social comparison can contribute to anxiety, depression, and low self-esteem (Perloff, 2014).

Cyberbullying is a significant issue on social media platforms, with research indicating that victims are more likely to experience mental health issues such as depression and anxiety (Kowalski et al., 2014). The anonymity of online interactions can exacerbate the severity of bullying. Social media addiction is characterized by excessive use that interferes with daily functioning and well-being. The results of social media compulsive use were generated in previous research which asserted that social media is associated with addiction, and it is proven to increase stress, reduce the academic performance of students, and disrupt sleep patterns (Andreassen et al., 2016). One factor to consider is the potential link between the frequency of social media use and feelings of loneliness and social isolation among students. Even if, social media appears to foster social engagement and connection, research reveals that excessive dependence on digital communication can increase feelings of loneliness and isolation. People who spend an excessive amount of time on social media platforms may find themselves substituting meaningful face-to-face interactions with superficial online exchanges, leading to a sense of disconnection from their peers and the broader community (Nazari et al.,

2023).

Furthermore, the constant browsing through some picture collections and status updates on social media feeds may promote inaccurate ideas about others' lives, contributing to the phenomena known as "social comparison." As students repeatedly compare their own lives to the seemingly perfect portrayals of others online, they may experience heightened levels of self-doubt, inadequacy, and dissatisfaction (Ofuebe et al., 2022). This perpetual cycle of comparison and self-evaluation can significantly impact their mental well-being, potentially leading to increased feelings of depression and anxiety. According to Abd Rasid et al. (2024), constant investigation of the frequency of social media use among young adults reveals the intricate interplay between digital engagement and mental health outcomes. Researchers may acquire a better understanding of the multiple effects of social media on students' well-being by investigating how their online actions alter their experiences of loneliness, social comparison, sleep quality, and academic performance. With this understanding, interventions can be devised to promote healthy digital habits and foster a supportive online environment for students' mental health and overall well-being.

Current research continues to explore the nuanced relationship between social media use and mental health and shed exposure on both adverse effects and potential benefits. Social media could also lead to anxiety and recent studies have reinforced the link between excessive social media use and increased anxiety, for instance, Elhai et al. (2020) stated that research has shown that social media-induced anxiety is often related to exposure to negative content and the fear of missing out (FOMO). Other research has progressively focused on how social media affects body image and self-esteem. Studies indicate that exposure to idealized body images and beauty standards on platforms like Instagram can lead to body dissatisfaction and self-esteem issues, particularly among young women (Fardouly et al., 2018). Attention to positive mental health outcomes has been alarming to social media experts, thus several research have been conducted to investigate some prominent negative impacts. There is some topical literature which highlights the positive aspects of social media. Studies have found that social media can facilitate social support, foster positive relationships, and provide resources for mental health awareness and intervention (Naslund et al., 2016). From the literature above literature, most of it focuses on the negative consequences of social media use, such as addiction, FOMO (fear of missing out), and depression. To address this issue, it is recommended that future research is needed to explore the potential positive effects, such as social support, community building, and mental health awareness, which can offer a more balanced view.

There is a growing focus on the impact of social media on mental health, with recent research exploring digital detoxication. The concept of digital detox refers to periods of intentional disconnection from social media that are gaining traction as users seek to mitigate the negative effects of excessive use (Ahn & Park, 2022). Besides, the platform providers spare some initiatives to promote positive mental health amongst its users. Robert and David (2022) asserted that social media companies are gradually incorporating features designed to promote mental well-being, such as reminders to take breaks, tools to manage screen time, and resources for mental health support. Other research has also found that ongoing research and advocacy efforts are addressing the mental health implications of social media, emphasizing the need for balanced usage and support strategies (O'Reilly et al., 2023).

Most people's mental health has been declining since Facebook became mainstream and took off in popularity circa 2008, from year to year it surpassed Myspace as the most-visited social media website and billions of people registered on Facebook. This trend has continually preceded, and researchers continued to observe a 40 per cent increase in depressive symptoms, suicidal ideation, and suicidal behaviour among young people in the decade before the pandemic (CDC, 2018). Moreover, the frequency of social media use can also intersect with other aspects of young adults' lives especially higher institution students' sleep quality and academic performance. Research indicates that excessive screen time, particularly before bedtime, can disrupt sleep patterns and impair overall sleep quality. The constant stimulation from social media notifications and content consumption may interfere with students' ability to unwind and relax, leading to difficulties in falling asleep and obtaining recuperative rest (Bragazzi et al., 2022). As a result, sleep deprivation caused by excessive social media use can aggravate weariness, irritability, and mood swings, jeopardizing students' mental health and academic performance.

3. Social Participation and Social Behavior

Social media has transformed social participation, offering both opportunities and challenges for young adults. There are also studies which examine the perspectives of social media's impact on the quality of interpersonal relationships, particularly within family settings. Several views presumed that social media diminishes quality time among family members as well as friends. According to Mulisa and Getahun (2018), many individuals reported that social media usage reduced the quality of time spent with family and friends, leading to feelings of emotional detachment. This suggests that the predominant presence of social media can interfere with meaningful, in-person interactions, potentially weakening the emotional bonds that are critical for healthy relationships. Moreover, Kennedy and Lynch (2016) found that adolescents often experienced tension and problems within their household dynamics when phone use was prioritized over face-to-face communication. This preference for digital interaction over direct engagement with family members can lead to misunderstandings, conflicts, and a sense of disconnection within the family. These findings emphasize the need for a balanced approach to social media use, particularly among young people, to ensure that it does not undermine important familial relationships and emotional well-being.

Social media enables young adults to enhance their connectivity with others across geographic boundaries, fostering engagement with diverse communities and support networks (Ellison et al., 2021). This increased connectivity can help cultivate a sense of belonging, allowing young individuals to feel more integrated within various social spheres. Additionally, social media provides access to a wide range of resources and information, which can be particularly valuable for personal growth, education, and emotional support. This digital interaction thus plays a critical role in broadening young adults' social experiences and enhancing their ability to connect with like-minded individuals or groups, regardless of physical distance. Despite the connectivity benefits that social media offers, its use can unexpectedly lead to social isolation. Research suggests that intense social media use is often linked to a reduction in face-to-face interactions, which in turn, increases feelings of loneliness (Primack et al., 2017). Social media facilitates communication and connection, nevertheless, the quality of these online interactions may not be sufficient to replace the depth and emotional fulfilment that comes from in-person engagement. As a result, individuals who rely heavily on social media for social interaction may experience a sense of disconnection and loneliness, despite being constantly connected online.

Relying heavily on digital communication can have significant effects on the development and maintenance of real-world social skills. Research indicates that extensive use of social media may impair the ability to effectively navigate face-to-face social situations (Uhls et al., 2014). This reliance on online interactions can lead to difficulties in reading social indications, engaging in meaningful conversations, and building strong interpersonal relationships in person. Undoubtedly social media has undeniably transformed social participation by offering new opportunities for connection and engagement, it also presents challenges for young adults, who must balance the benefits of online communication with the need to cultivate and maintain essential social skills in the offline world. The impact of social media on social participation and behaviour continues to be a significant area of research, with recent studies providing new insights into its effects.

Social media has been shown to significantly enhance social capital by connecting users with supportive communities and fostering social engagement. Recent research by Putnam (2022) suggests that online communities can play a crucial role in strengthening real-world social ties and promoting active community involvement. By providing platforms for users to share information, mobilize around common causes, and engage in meaningful dialogue, social media can contribute to the development of stronger, more connected communities. Social media platforms facilitate the sharing of information, mobilization around common causes, and meaningful dialogue among users. This ability to connect people and foster communication contributes to the development of stronger, more cohesive communities. Enhanced social capital, driven by these interactions, can lead to increased engagement in civic activities, such as volunteering, advocacy, and local initiatives. As a result, social media helps reinforce the social fabric of communities, both online and offline, by encouraging active participation and collaboration among members. This strengthened sense of community can enhance collective efforts and support for various causes, ultimately benefiting society. This enhanced social capital can lead to increased participation in civic activities, such as volunteering, advocacy, and local initiatives, thereby reinforcing the social fabric of communities both online and offline.

The role of social media in shaping political attitudes and behaviours has become a significant area of study. Recent research has focused on how social media platforms influence political participation, the formation of opinions, and the dissemination of misinformation (Tucker et al., 2018). These platforms provide a space for individuals to engage with political content, share their views, and mobilize around political causes. However, they also pose challenges by enabling the rapid spread of false information, which can shape public opinion and influence electoral outcomes. In parallel, the rise of digital activism and online social movements highlights the power of social media to mobilize collective action. Recent studies by Boulianne (2019) examine how social media platforms are leveraged to advocate for social justice issues and drive societal change. These platforms have become critical tools for organizing protests, raising awareness, and building support for various causes. The ability to quickly gather large groups of people around a common goal underscores the transformative potential of social media in facilitating grassroots activism and influencing public policy. Social media has emerged as a potent instrument for digital activism and the organization of social movements. Boulianne (2019) emphasizes the significant role of platforms such as Twitter and Facebook in facilitating collective action and advocating for social justice issues. These platforms enable users to efficiently coordinate protests, increase awareness about various social causes, and shape public opinion on a diverse array of issues. The ability to quickly disseminate information and mobilize support underscores the transformative impact of social media in driving societal change and fostering civic engagement.

Social Media, Identity Formation and Self-Presentation

Recent literature continues to investigate how social media influences identity formation and self-presentation. Studies have explored how young adults curate their online personalities and manage the balance between authenticity and self-presentation. Research by Marwick (2021) indicates that users often navigate a delicate balance between showcasing an idealized version of themselves and maintaining a sense of authenticity. This dynamic illustrates the broader challenge of balancing the presentation of a refined, idealized image with the need to remain true to one's authentic self in the digital space. Social media users often contend with the tension between crafting a strong personality that aligns with societal standards or personal aspirations and maintaining genuine self-representation. This interplay between self-presentation and authenticity is central to understanding how individuals navigate their online identities and the impact of these multiple personas on their real-world interactions and self-perceptions.

Additionally, the integration of online and offline identities has become a significant focus of research. Studies, such as those by Vasalou et al. (2008), examine how interactions on social media shape and reflect users' real-world identities. These studies suggest that online personalities can significantly influence offline behaviours and vice versa, emphasizing the interconnectedness between digital and real-life identities. This relationship highlights how interactions and self-representations on social media can shape real-world actions, attitudes, and relationships. Conversely, offline experiences and behaviours can also impact how individuals present themselves online, reflecting a continuous interplay between the digital and physical aspects of identity. Understanding this interplay is crucial for comprehending how social media affects personal identity and social media on how individuals perceive themselves and interact with others, both online and in person. How people develop and present their online personas can shape their self-image and influence their real-world behaviours and interactions. Similarly, offline experiences and social contexts can affect how individuals manage their digital identities. This dynamic interplay highlights the role of social media in shaping personal identity and social relationships, bridging the gap between virtual and physical experiences.

Much of the research focuses on the negative aspects of social media, but there are also notable benefits. Social media can serve as a valuable resource for individuals facing personal challenges or seeking information on specific issues. Online communities provide emotional support and practical advice, which can contribute significantly to overall well-being (Hampton et al., 2011). These platforms facilitate connections with others who share similar experiences, providing a sense of solidarity and valuable guidance. By joining online communities that align with their challenges or interests, individuals can find support, share advice, and receive encouragement from peers who understand their situation. This shared understanding fosters a supportive environment that can alleviate feelings of isolation and help individuals navigate their challenges more effectively. In addition to the above, social media platforms offer opportunities for creative expression and identity exploration. Young adults often use these platforms to showcase their talents, interests, and personal achievements, which can enhance self-esteem and self-awareness (Marwick & Boyd, 2014). By sharing their

creative work and personal milestones on social media, individuals can gain recognition and receive feedback, which can help them further explore and develop their identities. This process contributes to a more positive self-concept and enhances self-awareness by validating their abilities and achievements. Engaging with others through these platforms allows individuals to reflect on their talents and aspirations, fostering personal growth and a deeper understanding of their potential.

Social media plays a significant role in facilitating civic engagement and activism by connecting individuals with various causes and movements. Research by Tufekci (2017) demonstrates that these platforms are effective in mobilizing communities and amplifying voices on social and political issues. Social media facilitates the rapid dissemination of information, allows for widespread outreach, and enables coordinated efforts for advocacy and activism. By connecting like-minded individuals and organizations, social media helps to rally support, organize actions, and influence public discourse on various social and political matters. Social media also enables users to organize and participate in campaigns, advocate for policy changes, and spread awareness about pressing issues. The provision of a platform for the widespread dissemination of information and the coordination of collective action, social media significantly enhances individuals' ability to engage in civic activities and contribute to societal change. It allows for the rapid spread of information, mobilizes communities around shared causes, and facilitates the organization of events and campaigns. This capability not only amplifies individual voices but also fosters broader community involvement and participation in social and political movements.

4. Regulatory Enforcement of Social Media Usage in Malaysia

The literature on regulatory frameworks for social media usage among young adults in Malaysia focuses on the balance between protecting young users and ensuring their rights to free expression and access to information. This body of research highlights the role of laws, regulatory bodies, and public initiatives in managing the complexities of social media in the lives of young Malaysians. Social media regulatory enforcement for young adults in Malaysia is important since it faces several key concerns, reflecting the complexities of balancing regulation with freedom of expression, privacy, and the unique vulnerabilities of this age group. These concerns are particularly relevant in a rapidly evolving digital landscape where young adults are highly active online. Regulatory enforcement on social media usage among young adults in Malaysia is shaped by a comprehensive legal framework aimed at protecting users from online harms while balancing the need for free expression. The CMA, PDPA, and other laws provide the foundation for regulating social media, with the MCMC and other bodies playing critical roles in enforcement. However, the challenges of balancing regulation with civil liberties, adapting to technological changes, and ensuring effective enforcement remain central to ongoing discussions in this area. As social media continues to be an integral part of young adults' lives, the development of responsive and effective regulatory strategies will be crucial in ensuring their safety and well-being online.

The Malaysian Communications and Multimedia Commission (MCMC) is the primary regulatory body overseeing social media use in Malaysia. It plays a crucial role in enforcing some relevant acts and other related regulations in social media use. The MCMC has been active in monitoring and addressing issues such as cyberbullying, online harassment, and the spread of fake news, which disproportionately affect young adults (Balakrishnan & Norman, 2020). The commission also collaborates with social media companies to ensure that harmful content is removed and that platforms comply with Malaysian regulations. The cybersecurity agency in Malaysia works alongside the MCMC to protect young adults from cyber threats, including phishing, hacking, and online exploitation. It provides resources and support for victims of cybercrime and promotes cybersecurity awareness among young Malaysians (Jalapar, et al., 2024). Their efforts include educational campaigns aimed at teaching young adults to adopt safe online practices.

The legislative framework and regulatory policies for the usage of social media are governed by the Communications and Multimedia Act 1998 (CMA). The CMA 1998 is the cornerstone of Malaysia's digital regulation, providing the Malaysian Communications and Multimedia Commission (MCMC) with the authority to oversee and regulate internet and social media use if there should be any misuse of social media. The act provides a legal framework for regulating the communications and multimedia industry in Malaysia, and it has been a beneficial instrument for addressing various issues related to social media misuse such as cyber harassment, the spread of obscene or harmful online content, and the misuse of network facilities, all of which

are particularly relevant to young adults with the purpose to protect them from harmful online content (Ahmad & Othman, 2021). In summary, the CMA 1998 plays a crucial role in Malaysia's legal landscape by allowing for the prosecution of social media misuse, with a strong focus on safeguarding young users from harmful content and online behaviours. This legislation serves as a key legal instrument to ensure that social media platforms are not used to exploit, harm, or endanger young individuals.

Besides the above regulations, the Personal Data Protection Act 2010 (PDPA) has its role in regulating the collection, processing, and storage of personal data, with significant implications for young adults who are active on social media. This act aims to protect users from data breaches and unauthorized use of personal information by social media platforms, ensuring that young adults' privacy is safeguarded (Camerini et al., 2020). Compliance with the PDPA is mandatory for companies operating in Malaysia, including social media platforms, which must ensure that user data is handled securely by the law. In conclusion, compliance with the PDPA is essential for social media platforms operating in Malaysia. It ensures that user data is handled securely and by the law, protecting both the users' privacy and the platforms' integrity.

In Malaysia, the Penal Code and the Sedition Act 1948 are two significant pieces of legislation that have implications for social media use. These laws can be invoked to address issues such as hate speech, defamation, incitement, and other forms of harmful content that may be shared or disseminated through social media platforms. These laws have been applied in cases where social media usage involves hate speech, defamation, or content that threatens public order. Young adults are often the subject of enforcement actions under these laws, particularly in cases involving the spread of seditious or defamatory content online (Soyleyici & Kalkan, 2023). The use of these laws has sparked debates about the impact on freedom of expression, especially among the younger population who are more active on social media. Acts related to social media usage are important in Malaysia for several reasons, primarily because the acts help to regulate online behaviour, protect individuals and communities, maintain public order, and ensure that digital platforms are used responsibly. Given the extensive influence of social media in modern society, these regulations play a critical role in addressing the challenges and risks associated with digital communication. Addressing these challenges requires ongoing efforts to refine regulations, enhance digital literacy, and foster collaboration among stakeholders to create a safer and more supportive online environment for young adults. Regulatory efforts in Malaysia have increasingly focused on addressing cyberbullying and online harassment, which are significant concerns for young adults. The CMA and Penal Code have been used to prosecute cases involving these issues, with the MCMC actively working to remove harmful content and support victims (Ismail & Ahmad, 2020). Nonetheless, enforcement remains challenging due to the unknown nature of online interactions.

The spread of misinformation and hoax news on social media has also been a growing concern, particularly in how it affects young adults' perceptions and behaviours. The MCMC has implemented measures to counter fake news, including public awareness campaigns and collaboration with social media platforms to flag and remove false content (MCMC, 2020). These efforts aim to protect young users from being misled by inaccurate information online. Other than that, there has been a push to improve digital literacy and online safety among young adults in Malaysia, to promote responsible social media use. Educational initiatives led by the government and non-governmental organizations (NGOs) focus on teaching young people about privacy, data protection, and the risks associated with social media use (Ayub et al., 2020). These programs are designed to empower young adults to navigate social media safely and make informed decisions about their online activities. One of the main criticisms of Malaysia's regulatory approach to social media is the potential for overreach, which could stifle free expression, particularly among young adults. The use of the Sedition Act and Penal Code to penalize online speech has raised concerns about the impact on civil liberties (Sreedharam & Ramayah, 2020). Critics argue that while regulation is necessary to protect young users, it should not infringe on their rights to express themselves freely.

Despite the robust legal framework, the effectiveness of enforcement remains a challenge. The vastness of social media platforms and the speed at which content can spread make it difficult for regulatory bodies to monitor and address all issues in real-time (Al-Dheleai et al., 2020). This has led to calls for more sophisticated tools and increased collaboration between the government, social media companies, and civil society to ensure that regulations are effectively enforced. As social media platforms continue to evolve, there should also the regulatory frameworks that govern the emerging technology. There is an ongoing need to update laws and

enforcement strategies to keep pace with new developments, such as the rise of encrypted messaging apps and the increasing use of artificial intelligence in content moderation (Balakrishnan & Norman, 2020). Ensuring that regulations remain relevant in the face of technological change is a key challenge for policymakers.

In summary, acts related to social media usage are vital in Malaysia for maintaining public order, protecting individuals, promoting responsible digital citizenship, balancing freedom of expression with legal boundaries, and adapting to the challenges of the digital age. These regulations ensure that social media remains a positive force in society while mitigating its potential risks.

5. Conclusion

The literature review on the impact of social media on the mental health of young adults presents a nuanced picture of both positive and negative influences. Social media, while offering significant benefits, also poses substantial risks to the mental well-being of this demographic. Social media platforms facilitate enhanced connectivity, enabling young adults to engage with diverse communities, form supportive networks, and participate in civic activities. These platforms offer opportunities for creative expression, identity exploration, and the development of a sense of belonging, all of which contribute positively to self-esteem and overall well-being. Studies often treat social media as a massive entity without differentiating between platforms like Instagram, TikTok, X (Twitter), or Facebook, each with unique features and user interactions. Hence, there is a need to examine the specific effects of different platforms on mental health, considering variations in user behaviour, content exposure, and platform design.

Despite these benefits, excessive social media use has been linked to adverse mental health outcomes, including increased rates of depression, anxiety, and diminished self-esteem. The pressure to maintain idealized online personas and the prevalence of social comparison can lead to dissatisfaction with one's own life. Additionally, exposure to harmful content and the disruption of sleep patterns due to social media addiction further exacerbate these mental health challenges. Most existing studies are cross-sectional, providing a glimpse of the relationship between social media use and mental health at a single point in time. It is proposed that future research should conduct a longitudinal study to monitor and track changes in mental health over extended periods to better understand causality and long-term effects. Other than that, the existing research frequently highlights associations between social media use and mental health issues, such as anxiety, depression, and low self-esteem, but often lacks depth in explaining the underlying mechanisms. Nevertheless, further exploration of how factors like social comparison, cyberbullying, validation-seeking behaviour and algorithm-driven content consumption impact mental health is necessary to be research in the future.

The literature highlights the importance of regulatory frameworks and educational initiatives in mitigating the negative effects of social media. In regions like Malaysia, regulations such as the Personal Data Protection Act (PDPA) and the Communications and Multimedia Act (CMA) aim to protect young adults from the harmful impacts of social media while promoting safe and responsible use. However, the effectiveness of these measures in addressing mental health concerns is still under examination, emphasizing the need for continuous evaluation and adaptation of policies.

The overall conclusion from the literature suggests that while social media offers valuable tools for communication and self-expression, it also carries significant risks to mental health, particularly when usage becomes excessive or unregulated. Addressing these challenges requires a balanced approach that includes promoting digital literacy, encouraging healthy social media habits, and implementing effective regulatory measures. By fostering a more informed and mindful approach to social media use, stakeholders can help young adults navigate the digital landscape in a way that supports rather than undermines their mental health.

The interplay between social media regulation and mental health among young adults in Malaysia underscores the need for a nuanced approach to digital governance. Social media platforms have a profound impact on the mental well-being of young people, presenting both opportunities for positive engagement and risks that require careful management. The regulatory enforcement of social media in Malaysia plays a critical role in shaping the mental health outcomes of young adults. By addressing mental health risks, protecting privacy, balancing freedom with regulation, and fostering digital literacy, Malaysia can create a safer and more

supportive online environment. Effective regulation, combined with educational and supportive measures, can help young adults navigate social media in a way that enhances their overall well-being and mitigates potential negative impacts.

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Understanding Gen Z's Online Purchase Behavior through their Hedonic and Utilitarian Motivation

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Abstract: The COVID-19 pandemic ushered in lockdowns, limiting consumer movement to their homes and preventing consumers from shopping in brick-and-mortar stores. Consequently, consumers were reliant on e-commerce to manage their daily purchases of goods and services. This exacerbated the use of e-commerce and fast-tracked the growth of the digital economy. In this study, Gen Z's consumer motivation is investigated using hedonic and utilitarian motivation and the Unified Theory of Acceptance and Use of Technology (UTAUT). Consumer motivation remains a crucial part of consumer behavior studies given its prominence in influencing consumer action, consumer decision-making and preferences. In particular, the effects of hedonic and utilitarian motivation on online purchase behavior were investigated. This study utilized a quantitative approach through the deployment of a survey questionnaire online. The data from 156 respondents was analyzed using SmartPLS 4.0 utilizing Partial-Least Squares Structural Equation Modelling. Approximately 44% of the respondents started shopping online for the first time during the pandemic (i.e., 2020 and 2022). The results indicated that the Gen Z respondents were motivated by utilitarian and hedonic motivation when shopping online, in particular by Idea Shopping motivation and Efficiency motivation. Additionally, Social Influence and Facilitating Conditions were significant factors in influencing Behavioural Intention, and Behavioural Intention influenced Purchase Behaviour. The evidence suggests that the respondents were not novice online shoppers but rather experienced online shoppers.

Keywords: *Technology Acceptance Model, shopping motivation, utilitarian motivation, hedonic motivation, online purchase behavior*

1. Introduction and Background

The value of Asia's e-commerce revenue in 2023 amounts to USD 1,664 billion, the highest when compared to global regions and surpassing the Americas by almost half the value (Statista, 2024). Undoubtedly, e-commerce has expanded rapidly over the past decade and its growth was further spurred by the Covid-19 pandemic. The COVID-19 pandemic resulted in lockdowns and movement orders where consumers were not able to leave their homes and convene in public spaces, a crucial public health policy that was used as a temporary measure to control the spread of the COVID-19 disease. As a consequence of the pandemic, the consumer's shift to the digital economy was deemed to be necessary and inevitable. Following the easing of lockdowns, consumers continued to use e-commerce in their daily lifestyles with almost 92% of consumers embracing online shopping and then continuing as e-commerce users even after the easing of movement restrictions (McKinsey, 2024). Consumers continuing to use ecommerce platforms resulted in a massive growth of the ecommerce sector which incidentally aligns with the growth of digital economies in the Southeast Asia region as indicated by the direction of local government policies. In Southeast Asia, where the estimated population is around 570 million, the trend of e-commerce is expected to grow with a projected expansion rate of 20 – 30% annually (Hrjnic, 2020).

Consumer adoption of e-commerce or consumer use of technology takes place when consumers begin using technology (via online sites, platforms, apps, and mobile devices) for their daily tasks. Within information systems literature, technology acceptance research has resulted in a substantial amount of literature on the adoption and use of technology in the consumer's life (Hu et al., 1999). Specifically, the prominence of the Unified Theory of Acceptance and Use of Technology (UTUAT) (Venkatesh et al., 2003) prevails due to its application to multiple technology adoption contexts. In recent years in consumer online shopping, UTAUT has been applied to various contexts including e-wallet adoption (Bommer et al., 2022), social e-commerce (Habeeb et al., 2021), mobile payment (de Sena Abrahão et al., 2016) and webrooming (Chimborazo-Azogue et al., 2021). The wide use of UTAUT is encouraged by calls to extend and use the theory in various contexts. In 2003, Venkatesh et al. suggested testing UTAUT across various technologies, specifically on e-commerce applications. Additionally, Venkatesh et al. (2016) highlighted the necessity of extending the UTAUT model to better understand technology acceptance and use. Further analysis of UTAUT's contributions by incorporating new

exogenous or endogenous variables would extend the understanding of consumer acceptance phenomena.

In this study, UTAUT will be extended through an investigation into consumer shopping motivation. Shopping motivation has been studied through various approaches resulting in multiple interpretations (Arnold and Reynolds, 2003; Westbrook and Black, 1985; Bloch et al., 1994). In consumer behavior, motivation is a pertinent area of study given its importance in motivating consumer behavior (Lee, 2006; Rajamma et al., 2007) and consumer preference (Dawson et al., 1990). Therefore, the investigation into hedonic and utilitarian motivation in the larger online shopping context is needed to understand the consumers' drive towards their goal which is to purchase using e-commerce (Novela et al., 2020). The importance of understanding consumer motivation in e-commerce is crucial given that shopping motivation is an established area of study whereby, consumers can be motivated by utilitarian motivation (Babin et al., 1994) and hedonic motivation (Arnold and Reynolds, 2003). Consumer motivation can influence engagement, user experience (O'Brien, 2010), purchase intention (Koch et al., 2020) and even persuasive marketing strategies (Adaji et al., 2020) in e-commerce. Evidently, a consumer's motivational drive is a pertinent and ever-evolving puzzle for consumer researchers to understand. Therefore, this study pursues the investigation of utilitarian and hedonic motivation in online shopping focusing on Gen Z. Gen Zs are the focus of this study given that are likely to adopt the use of e-commerce platforms for the first time during and post-pandemic (i.e., 2020, 2021); beyond the lifting of movement restrictions.

2. Literature Review

Unified Theory of Acceptance and Use of Technology: UTAUT was introduced in 2003 by Venkatesh et al. and was first developed to integrate various theories explaining technology and innovation adoption across fields such as management, marketing, social psychology, and information systems (Williams, Rana, and Dwivedi, 2015). UTAUT was put forward based on the synthesis of eight competing theoretical models during a time when the influence of the internet and personal computers for consumer use was growing. The models that formed the basis for UTAUT include Social Cognitive Theory (SCT), Motivational Model (MM), Innovation Diffusion Theory (IDT), TPB and TAM (C-TPB-TAM), Theory of Planned Behaviour (TPB), Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), and Model of PC Utilization (MPCU). In UTUAT, the probability of adopting technology is shaped by four main factors which are - 1) Performance Expectancy, 2) Effort Expectancy, 4) Social Influence, and 5) Facilitating Conditions. Additionally, the impact of these factors is moderated by variables such as age, gender, experience, and the voluntariness of use. The fundamental concept of UTAUT rests on the principle that behavioral intention predicts behavior which also aligns with that of TAM (Venkatesh et al., 2003).

In an analysis of UTAUT studies, the theory has been used in multiple contexts including studies in information systems, systems used in the office, general-purpose systems, and specific business systems (Williams et al., 2016). Specifically in consumer behavior, UTAUT has been employed repeatedly to explain consumer behavior in mobile shopping (Tan et al., 2010) online banking (Zhou et al., 2010), online shopping (Chang et al., 2016; Amjad-ur-Rehman, 2019; Erjavec et al., 2022) and mobile commerce (Marinković et al., 2020).

According to Venkatesh et al. (2003), Performance Expectancy refers to the likelihood that an individual believes that using the system will help him or her to attain gains in job performance. In voluntary and mandatory settings, evidence indicates that Performance Expectancy becomes the key predictor of both, behavioral intention and behavior (Zhou, Lu and Wang, 2010; Venkatesh, Thong and Xu, 2016). Studies also indicate that Performance Expectancy is a key determinant in user acceptance or rejection of technology (Yang and Forney, 2013; Ratten, 2015; Tarhini et al., 2016;). It is inferred through previous studies that Performance Expectancy has a significant influence on the users' intention to purchase online (Musleh et al., 2015; Yeganegi and Elias, 2016). The proposed hypothesis is as follows:
H1: Performance Expectancy has a significant influence on Behavioural Intention

Effort Expectancy is defined to be the degree of ease associated with the use of the system (Venkatesh et al., 2003). The concept of Effort Expectancy revolves around the users' perception of their ease or difficulty in using a specific technology. Naturally, when users increase their experience and become more familiar with the said technology, Effort Expectancy then loses its' significance as a factor that shapes user intention to use the technology (Gupta, Dasgupta and Gupta, 2008; Chauhan and Jaiswal, 2016). Evidence from previous studies

indicates that behavioral intention is shaped by Effort Expectancy (San Martín and Herrero, 2012; Alleyne and Lavine, 2013; Escobar-Rodríguez and Carvajal-Trujillo, 2014; Ho et al., 2016; Isaias et al., 2017; Tan and Lau, 2016). Thus, the following hypothesis is proposed:
H2: Effort Expectancy has a significant influence on Behavioural Intention

Another factor influencing behavioral intention in UTAUT is Social Influence. Social Influence indicates the degree to which an individual perceives that important others believe he or she should use technology. Social Influence refers to social norms that might shape the individual's decision to use technology. In particular, social norms can mediate the relationship between intention and behavior adoption (Venkatesh et al., 2003). Evidence suggests Social Influence emerges in mandatory contexts that require user compliance, however, is less influential in non-mandatory user contexts (Venkatesh and Davis, 2000). Even though the evidence is mixed on the consistency of social norms on adoption behavior across different contexts, Ho et al. (2016) specify that in online purchases, user adoption is influenced by social norms. Thus, it is likely that the prominence of Social Influence in user adoption can vary across different contexts (Zhou, Lu and Wang, 2010; Chauhan and Jaiswal, 2016). Resultant to the above, the following hypothesis is proposed:
H3: Social Influence has a significant influence on Behavioural Intention

Facilitating Conditions refer to the degree to which a user believes that infrastructure exists to support the use of the system, whether organizational or technical. In the early stages of adoption, Facilitating Conditions has a significant positive effect on behavioral intention. However, the effect fades as the user continues with technology use and eventually becomes not significant. Facilitating Conditions can also have a direct effect on technology adoption behavior (Venkatesh et al., 2003). El-Masri and Tarhini (2017) and Slade et al. (2015) have found a significant effect of Facilitating Conditions on behavioral intention in online shopping. As such, the following hypotheses are proposed:
H4: Facilitating Conditions have a significant influence on Behavioral Intention
H6: Facilitating Conditions have a significant influence on Behavior

The underlying framework for UTAUT is based on the user technology acceptance model which posits that individual reactions to using information technology influence intentions, thereby shaping the actual use or behavior – whereby, behavioral intention is defined as the intention to use technology (Venkatesh et al., 2003). In UTAUT, intention is a key predictor of behavior, even in the online purchase context (Yeganegi and Elias, 2016) and is not limited to mandatory context. Previous findings indicate that behavioral intention has a significant influence on actual behavior (Venkatesh et al., 2003). Consequently, the following hypothesis is proposed:
H5: Behavioural Intention has a significant influence on Behavior

Shopping Motivation: Arnold and Reynolds (2003) identified six dimensions of hedonic shopping motivation in their study which are the following: 1) Adventure; 2) Social; 3) Gratification; 4) Idea; 5) Role; and 6) Value. Consumers can be motivated by hedonic motivations (Adventure, Gratification, Value, Social, and Idea Shopping) and utilitarian motivations (Achievement and Efficiency) (Kim, 2006). In online shopping experiences, O'Brien (2010) posits the influence of Adventure and Gratification shopping motivation and Achievement shopping motivation. When consumers look for enjoyable experiences to improve their mood or anxiety, consumers are deemed to have gratification-seeking motivation (Arnold and Reynolds, 2003). Gratification is delivered through the convenience of online platforms which are accessible at all times and enable the user to readily indulge in pleasurable shopping experiences (Jones et al., 2003). Additionally, consumers also seek adventure shopping whereby stimulation, excitement, and a sense of escapism are sought. Some consumers also seek out thrill and adventure. This concept aligns with previous research, which highlights that shoppers frequently pursue sensory stimulation as part of their shopping activities (Arnold and Reynolds, 2003). Attainment of delight and enthusiasm when shopping forms an aspect of adventure-seeking in consumer shopping (To et al., 2007). Conversely, Idea shopping motivation requires consumers to obtain and gather information and evidence about product use and the latest trends while they are (Horváth and Adıgüzel, 2018). Idea shopping can be a pleasurable experience for consumers who obtain pleasure from learning about new products and staying in the know (Arnold and Reynolds, 2003). Role shopping motivation is characterized by the enjoyment buyers experience when purchasing items for those other than themselves. Frequently, role shopping is seen to be utilitarian and less likely to be a hedonic impulse (Horváth and Adıgüzel,

2018). Consumers also can derive pleasure from shopping with friends and family – referring to social shopping motivation, consumers take part in it so that they can network and make connections with others (Arnold and Reynolds, 2003). In the online shopping context, consumers who share and exchange product information do so to build social relationships (Filipowski et al., 2012) and even build and sustain online relationships by engaging with online social groups (Lev-On and Lissitsa, 2015). Consumers seeking bargains, discounts and sales while shopping are shoppers who display value shopping motivation. These consumers invest effort in pursuit of products at discounted prices and view the attainment of a deal as rewarding (Kwon and Jain, 2009) and even pleasurable (Arnold and Reynolds, 2003).
As a result, the following hypotheses are proposed:
H7: Adventure shopping motivation has a significant influence on Behavioural Intention
H8: Gratification-seeking motivation has a significant influence on Behavioural Intention.
H9: Idea shopping motivation has a significant influence on Behavioural Intention
H10: Social shopping motivation has a significant influence on Behavioural Intention
H11: Role shopping motivation has a significant influence on Behavioural Intention
H12: Value shopping motivation has a significant influence on Behavioural Intention

In contrast to hedonic motivations, Babin et al. (1994) emphasize that utilitarian motivations center on efficiency and achieving specific goals during shopping. Rationality and the attainment of goals become the central theme in utilitarian shoppers where consumers strive for deliberate shopping experiences which are logical and efficient (Babin et al., 1994; Wolfinbarger and Gilly, 2001; Monsuwe et al., 2004; Delafrooz et al., 2009). A benefit of utilitarian-motivated online shopping includes crowd avoidance, time-efficient transactions and convenience (Brusch et al., 2019). Consumers favoring utilitarian motivations while shopping are looking for convenience, timely delivery, security, service and time savings. These consumers also use the Internet for information gathering contributing to decision-making (Shim et al., 2001). The inherent value consumers hold in shopping convenience has the potential to influence the decision of whether or not to shop online (Clemes et al., 2014) and thus, their online purchase intention. As such, the following hypotheses are proposed:
H13: Achievement motivation has a significant influence on Behavioural Intention
H14: Efficiency motivation has a significant influence on Behavioural Intention

3. Research Methodology

This research focuses on Gen Z (born between 1997 to 2012) aged between 20 to 24 years old who shop online. 156 respondents were retained from an initial 160 respondents after data cleaning whereby four respondents were removed due to inconsistent responses. The total number of respondents exceeds the minimum sample size calculated using G*Power (Faul, Erdfelder, Lang and Buchner, 2007). The minimum sample size was ascertained with a minimum power of 0.80, an effect size of 0.15, a 5% probability of error, with twelve predictors, whereby a minimum sample size of 87 is required. This study uses purposive sampling where respondents selected were online shoppers. Purposive sampling was chosen due to its efficiency and cost-effectiveness in attaining the objectives of this research design. Moreover, an online questionnaire incorporating the UTAUT construct items (Venkatesh et al., 2003) and the hedonic and utilitarian motivation items (O'Brien, 2010) was used in the questionnaire and was measured using a 7-point Likert scale ranging from 'Strongly Disagree' to 'Strongly Agree'. Finally, demographic information about the respondents' online shopping behavior formed the last part of the questionnaire. For data analysis, Partial Least Squares Structural Equation Modelling (PLS-SEM) analysis was conducted using SmartPLS4 software. This approach was chosen because PLS-SEM is potent for testing theoretical models for prediction purposes and is especially useful for complex models that include many constructs (Hair et al., 2019).

4. Results

Profile of Respondents: The respondents were undergraduate students aged between 21 and 22 years old and were of Malay ethnicity who were currently shopping online. From the sample, a total of 43.59% of the respondents only started purchasing online since the introduction of the Movement Control Order in 2020 and 2021 during the Covid-19 pandemic, where Malaysian citizens were restricted to their homes and could travel only within a radius of 10 km or less. Even so, about 67% of the respondents claim to be moderately to highly experienced in using online portals for shopping. Although the respondents were based in different geographic

locations across Malaysia, all respondents were able to purchase online. A larger majority of the respondents were from Selangor and Johor, making up about 53% of the total. The respondents from the remaining states comprise not more than 6% of the total each (Refer to Table 1)

Table 1: Online Purchasing Information and Geographic Location (n=156)

Started purchasing online because of the Movement Control Order (in 2020 or 2021)	
Yes	43.59
No	56.41
	100
Location	
Perlis	1.28
Kedah	5.13
Pulau Pinang	3.21
Perak	3.21
Kelantan	1.92
Terengganu	3.21
Pahang	5.77
Selangor	37.18
Negeri Sembilan	5.13
Melaka	0.64
Johor	16.03
Sabah	3.21
Sarawak	5.77
Wilayah Persekutuan Putrajaya	1.92
Wilayah Persekutuan Labuan	0.00
Wilayah Persekutuan Kuala Lumpur	6.41
	100
Level of Experience	0.64
Not experienced at all	2.56
Very little experience	9.62
Slightly experienced	19.23
Moderately experienced	26.28
Adequately experienced	31.41
Very experienced	10.26
Extremely experienced	0.00
	100.00

Measurement Model Analysis: In the measurement model analysis, the analysis of reliability and validity for the constructs are detailed in Table 2. Construct reliability—with Cronbach's alpha, composite reliability, and rho A—exceeding the 0.7 threshold (Hair et al., 2022) indicates that construct reliability was achieved for all measures with one exception - Cronbach's alpha for Efficiency motivation. However, the Cronbach alpha for Efficiency motivation is still within the acceptable range of being above 0.60 (Hair and Brunsveld, 2019) and thus was accepted. Outer loading scores were observed to be above 0.70 except for item AC1 (removed), demonstrating reliability (Hair et al., 2022). For convergent validity, the average variance extracted (AVE) scores were found to be 0.50 (Hair et al., 2022). The discriminant validity assessment using the heterotrait-monotrait ratio (HTMT) indicated values below 0.90. Also, the Fornell-Larcker Criterion (Table 6) revealed the square root of the AVE for each construct to be greater than the inter-construct correlations. The cross-loadings

(Table 7) show that all items were strongly associated with their corresponding constructs, thereby displaying discriminant validity (Hair et al., 2022).

Table 2: Measurement Model Evaluation

Constructs	Outer loadings	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability	Average variance extracted (AVE)
EE1	0.886	0.91	0.911	0.937	0.788
EE2	0.918				
EE3	0.863				
EE4	0.883				
PE1	0.884	0.847	0.857	0.908	0.767
PE2	0.915				
PE3	0.826				
SI1	0.924	0.931	0.933	0.956	0.879
SI2	0.942				
SI3	0.946				
FC1	0.866	0.884	0.895	0.92	0.742
FC2	0.902				
FC3	0.881				
FC4	0.793				
BI1	0.888	0.893	0.897	0.934	0.824
BI2	0.896				
BI3	0.939				
AD1	0.899	0.861	0.873	0.915	0.782
AD2	0.864				
AD3	0.89				
GR1	0.936	0.896	0.897	0.935	0.829
GR2	0.931				
GR3	0.863				
ID1	0.898	0.868	0.887	0.919	0.79
ID2	0.92				
ID3	0.847				
SO1	0.871	0.896	0.912	0.935	0.827
SO2	0.92				
SO3	0.935				
RO1	0.958	0.878	0.923	0.942	0.89
RO2	0.928				
VA1	0.812	0.804	0.806	0.884	0.718
VA2	0.886				
VA3	0.843				
Beh1	0.957	0.916	0.921	0.96	0.922
Beh2	0.964				
AC1	0.687	0.874	0.887	0.916	0.734
AC2	0.884				

AC3	0.93				
AC4	0.904				
EF1	0.843	0.692	0.715	0.865	0.762
EF2	0.903				

Structural Model Evaluation: Through the VIF scores (below 5), multicollinearity was not observed (Hair et al., 2022). Using bootstrapping with 10,000 resampling as specified by Becker et al. (2023), significance testing was carried out. The findings as reported in Table 3 show significant relationships for SI → BI ($\beta = 0.223$, $t = 2.21$, $p < 0.05$), FC → BI ($\beta = 0.387$, $t = 2.971$, $p < 0.05$), BI → BEH ($\beta = 0.261$, $t = 2.581$, $p < 0.05$), ID → BI ($\beta = 0.152$, $t = 2.155$, $p < 0.05$) and EF → BI ($\beta = -0.131$, $t = 2.071$, $p < 0.05$). The remainder of the hypotheses were not significant. Small effect sizes (f^2) were obtained for SI → BI ($f^2 = 0.043$, $p < 0.05$), FC → BI ($f^2 = 0.084$, $p < 0.05$), BI → BEH ($f^2 = 0.032$, $p < 0.05$), ID → BI ($f^2 = 0.033$, $p < 0.05$) and EF → BI ($f^2 = 0.027$, $p < 0.05$) (Cohen, 2013). The results indicate that 66.6% of the variance in BEH was explained by the variables in the study and 9.6% of the variance in BEH was accounted for by the BI construct (Figure 1). The Q^2 prediction scores were above zero thus showing predictive relevance for BI (0.574) and BEH (0.051) (Chin et al., 2020; Shmueli et al., 2019) (Table 4).

Table 3: Structural Model Evaluation

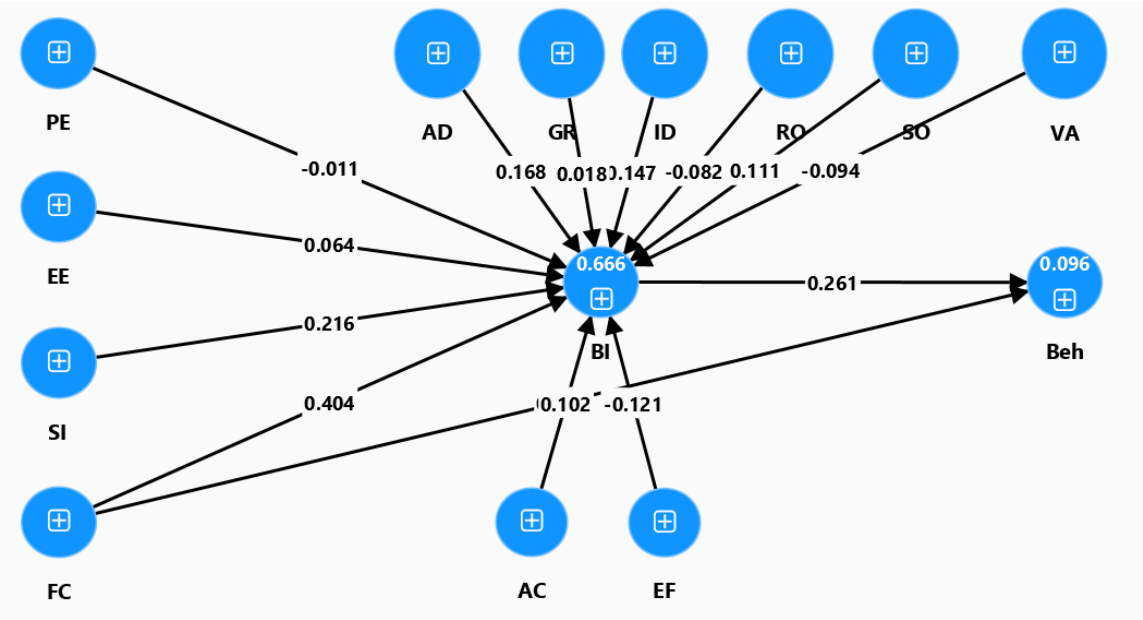
Hypotheses	Path	Standard beta	Standard error	t-value	p-value	Decision
H1	PE → BI	-0.011	0.091	0.115	0.908	Not supported
H2	EE → BI	0.06	0.121	0.498	0.618	Not supported
H3	SI → BI	0.223	0.101	2.21	0.027	Supported
H4	FC → BI	0.387	0.13	2.971	0.003	Supported
H5	BI → BEH	0.261	0.101	2.581	0.01	Supported
H6	FC → BEH	0.061	0.109	0.562	0.574	Not supported
H7	AD → BI	0.172	0.106	1.621	0.105	Not supported
H8	GR → BI	0.012	0.108	0.116	0.908	Not supported
H9	ID → BI	0.152	0.07	2.155	0.031	Supported
H10	SO → BI	0.113	0.084	1.337	0.181	Not supported
H11	RO → BI	-0.08	0.104	0.762	0.446	Not supported
H12	VA → BI	-0.083	0.108	0.77	0.441	Not supported
H13	AC → BI	0.117	0.092	1.276	0.202	Not supported
H14	EF → BI	-0.131	0.063	2.071	0.038	Supported

Table 4: Effect Sizes, Q prediction, R squared and VIF Evaluation

Hypotheses	Path	f^2	VIF	Q^2 predict	R^2
H1	PE → BI	0	2.833	0.574	0.666
H2	EE → BI	0.003	4.339		
H3	SI → BI	0.043	3.23		
H4	FC → BI	0.084	5.0		
H5	BI→ BEH	0.032	2.335	0.051	0.096
H6	FC → BEH	0.002	2.335		
H7	AD → BI	0.023	3.627		
H8	GR → BI	0	2.638		
H9	ID → BI	0.033	1.935		
H10	SO → BI	0.011	3.31		

H11	RO → BI	0.007	2.813
H12	VA → BI	0.007	3.55
H13	AC → BI	0.008	3.723
H14	EF → BI	0.027	1.604

Figure 1: Results of the Model Assessment



Discussion

Facilitating Conditions and Social Influence both had a significant impact on Behavioural Intention. Some observations indicate that in mandatory settings, Social Influence directly affects Behavioural Intentions because compliance is driven by the prospect of social rewards or punishments related to technology use or non-use. In contrast, others propose that in voluntary settings, Social Influence directly influences personal beliefs about technology. This observation stems from internalization and also identification, as individuals would want to keep a positive image and enhance their social status within their reference group by adopting the technology (Venkatesh and Morris, 2000; Venkatesh and Davis, 2000). The effect of Facilitating Conditions on Behavioural Intention is expected to increase with experience. Users are able to find multiple avenues for help and support needed to act on the behavior, and thus are able to remove any usage obstacles that may hinder long-term use (Bergeron et al. 1990). For this study, consumers shopping online display the ability to navigate and use online sites to fulfill their need to shop online. Moreover, Behavioural Intention has a significant influence on Purchase Behaviour, indicating that Gen Z consumers followed through with their intention to shop online.

Motivations exist as shopping goals (Westbrook and Black, 1985) and utilitarian and hedonic motivations are seen as the basic categories for understanding consumers (Babin, Darden and Griffin, 1994). Consumers prone to utilitarian shopping motivation seek efficiency while consumers shopping due to hedonic motivation seek entertainment and enjoyment (Hirschman and Holbrook, 1982). Babin et al. (1994) observe that consumers motivated by hedonic motivation shop because they enjoy the process of shopping while consumers motivated by utilitarian motivation shop for utility or functional benefits. In this study, Idea Shopping emerges to be a significant hedonic motivator of Gen Z's online shopping behavioral intention. Given that Idea Shopping refers to the consumers' act of collecting information, ideas and keeping abreast of trends when they are shopping (Horváth and Adıgüzel, 2018), consumers who are motivated in this manner derive pleasure from obtaining information about new products and services to stay on top of the latest trends (Arnold and Reynolds, 2003).
Within the dimensions of utilitarian motivation, Efficiency emerged in this study to have a significant effect on behavioral intention. Shopping efficiency is reflected in factors like convenience, product variety, product

information, and cost savings. Convenience is a major advantage of online shopping, offering the ability to shop from anywhere at any time (Rohm and Swaminathan, 2004). Online shopping also provides utilities such as location convenience, extended store hours, and fast, efficient checkouts (Rohm and Swaminathan, 2004). Thus, efficient shopping is a key feature of task-oriented shopping activities (Tauber, 1972).

5. Conclusion

This study explores both utilitarian and hedonic motivations in online shopping with a specific focus on Generation Z. Generation Z is of particular interest because they are expected to have begun using e-commerce platforms for the first time during and after the pandemic, especially as movement restrictions are lifted. The study revealed that Gen Z consumers are motivated by both utilitarian and hedonic motivations. For utilitarian motivation, Efficiency was a significant factor influencing the consumer's behavioral intention. Furthermore, for hedonic motivation, Idea Shopping emerged to be a significant factor in shaping behavioral intention. Facilitating Conditions and Social Influence were also significant factors contributing to Behavioural Intention while Behavioural Intention significantly influences Purchase Behaviour. According to the factors from UTAUT that were significant (Facilitating Conditions and Social Influence), it would appear that Gen Z online shoppers can easily navigate online shopping sites. Limitations to this study include a lack of specificity of the online sites that were used and the categories of products or services that were purchased online. This factor could provide a clearer picture of the motivation behind online purchases and such, future studies should consider the investigation of motivation based on specific types of products and services or online platforms rather than a generalized approach such as that employed in this study. Of particular interest, it would be noteworthy to see how Gen Z's motivation changes over a longitudinal period as they transition into different life phases.

The practical implications of note include the role of peer and Social Influence on youth online purchases where Gen Z's online purchase intention is shaped by those whose opinions matter to them. Thus, social shopping or shopping functions on social media platforms are expected to perform well with users in their early 20s. For this age cohort specifically, the connections between social media influence and what these consumers purchase would be beneficial to observe given that they are influenced by social norms. Additionally, Gen Zs are confident in their ability to purchase online despite (44% of the respondents) only having four years' experience in shopping online. Gen Z appears to be able to navigate through online shopping platforms easily. Practitioners looking to roll out or test variations of online shopping sites, apps and social shopping could look to Gen Z as early adopters. Gen Z users would likely adopt quickly to platform and functional changes in online platforms. Finally, given that Gen Z is motivated by both utilitarian and hedonic motivation namely, Efficiency and Idea Shopping – online shopping sites and apps should remain easy to use with quick speeds, easy checkout and a simple repeat purchase process to appeal to shoppers seeking efficiency. E-commerce and e-business platforms targeting Gen Z should bear in mind that speed and accessibility would matter to form the perception of efficiency in the young consumer's mind. Also, users from Gen Z enjoy online shopping given their indulgence in Idea Shopping to keep up with trends and new products. Practitioners would benefit from ensuring trendy items and the latest products are stocked in their online store if they want to appeal to consumers from Gen Z.

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Appendices

Table 5: HTMT

	AC	AD	BI	Beh	EE	EF	FC	GR	ID	PE	RO	SI	SO	VA
AC														
AD	0.724													
BI	0.681	0.712												
Beh	0.221	0.168	0.34											
EE	0.675	0.569	0.709	0.308										
EF	0.656	0.5	0.368	0.075	0.366									
FC	0.811	0.699	0.84	0.28	0.906	0.514								
GR	0.556	0.829	0.556	0.246	0.355	0.319	0.506							
ID	0.398	0.568	0.511	0.298	0.27	0.281	0.415	0.647						
PE	0.498	0.565	0.638	0.269	0.868	0.373	0.788	0.406	0.287					
RO	0.614	0.719	0.507	0.129	0.418	0.237	0.505	0.679	0.609	0.305				
SI	0.672	0.642	0.767	0.258	0.761	0.548	0.878	0.472	0.391	0.72	0.488			
SO	0.647	0.797	0.549	0.07	0.353	0.291	0.441	0.68	0.659	0.333	0.833	0.449		
VA	0.876	0.802	0.658	0.26	0.609	0.375	0.765	0.702	0.648	0.478	0.82	0.593	0.769	

Table 6: Fornell-Larcker Criterion

	AC	AD	BI	Beh	EE	EF	FC	GR	ID	PE	RO	SI	SO	VA
AC	0.857													
AD	0.625	0.884												
BI	0.609	0.633	0.908											
Beh	0.201	0.151	0.307	0.96										
EE	0.604	0.511	0.646	0.284	0.888									
EF	0.532	0.392	0.295	0.056	0.308	0.873								
FC	0.716	0.612	0.756	0.259	0.819	0.411	0.861							
GR	0.487	0.729	0.499	0.224	0.322	0.25	0.451	0.91						
ID	0.351	0.5	0.461	0.27	0.25	0.207	0.371	0.578	0.889					
PE	0.431	0.483	0.56	0.242	0.764	0.291	0.687	0.352	0.248	0.876				
RO	0.528	0.621	0.459	0.127	0.376	0.193	0.447	0.602	0.548	0.263	0.943			
SI	0.607	0.578	0.703	0.238	0.702	0.443	0.799	0.432	0.362	0.643	0.449	0.937		
SO	0.564	0.697	0.497	0.066	0.322	0.236	0.393	0.608	0.586	0.291	0.731	0.413	0.909	
VA	0.718	0.672	0.567	0.221	0.519	0.291	0.643	0.6	0.556	0.399	0.69	0.52	0.661	0.847

Table 7: Cross Loadings

	AC	AD	BI	Beh	EE	EF	FC	GR	ID	PE	RO	SI	SO	VA
AC1	0.687	0.627	0.472	0.1	0.425	0.261	0.509	0.504	0.485	0.275	0.666	0.497	0.713	0.815
AC2	0.884	0.456	0.463	0.171	0.538	0.504	0.607	0.376	0.205	0.385	0.349	0.46	0.365	0.588
AC3	0.93	0.502	0.578	0.216	0.535	0.503	0.654	0.412	0.259	0.401	0.433	0.558	0.439	0.546
AC4	0.904	0.561	0.555	0.19	0.562	0.533	0.668	0.386	0.267	0.404	0.379	0.553	0.436	0.543
AD1	0.559	0.899	0.628	0.146	0.515	0.327	0.577	0.651	0.472	0.465	0.554	0.542	0.619	0.627
AD2	0.496	0.864	0.505	0.138	0.356	0.335	0.504	0.569	0.405	0.362	0.512	0.473	0.588	0.531
AD3	0.602	0.89	0.536	0.116	0.471	0.383	0.538	0.711	0.444	0.447	0.579	0.511	0.643	0.618
BI1	0.652	0.645	0.888	0.25	0.688	0.342	0.789	0.478	0.4	0.554	0.467	0.656	0.479	0.573
BI2	0.445	0.507	0.896	0.286	0.482	0.227	0.604	0.447	0.466	0.467	0.376	0.597	0.432	0.483
BI3	0.545	0.562	0.939	0.302	0.575	0.227	0.653	0.431	0.394	0.497	0.399	0.655	0.44	0.481
Beh1	0.178	0.12	0.283	0.957	0.248	0.08	0.232	0.185	0.266	0.19	0.106	0.221	0.032	0.2
Beh2	0.207	0.168	0.306	0.964	0.295	0.03	0.263	0.243	0.254	0.271	0.136	0.236	0.092	0.223
EE1	0.469	0.463	0.56	0.25	0.886	0.296	0.687	0.225	0.264	0.766	0.306	0.583	0.298	0.395
EE2	0.481	0.39	0.556	0.198	0.918	0.18	0.678	0.214	0.203	0.759	0.308	0.603	0.277	0.392
EE3	0.588	0.449	0.572	0.259	0.863	0.213	0.765	0.388	0.205	0.614	0.34	0.626	0.285	0.527
EE4	0.598	0.508	0.603	0.297	0.883	0.395	0.77	0.311	0.215	0.581	0.376	0.676	0.283	0.522
EF1	0.3	0.272	0.227	0.07	0.14	0.843	0.261	0.226	0.288	0.17	0.088	0.347	0.156	0.13
EF2	0.598	0.401	0.284	0.032	0.373	0.903	0.439	0.213	0.096	0.323	0.234	0.421	0.247	0.354
FC1	0.59	0.533	0.67	0.274	0.671	0.322	0.866	0.434	0.405	0.567	0.444	0.693	0.392	0.543
FC2	0.657	0.515	0.643	0.306	0.758	0.38	0.902	0.377	0.295	0.637	0.375	0.696	0.283	0.584
FC3	0.663	0.561	0.726	0.183	0.775	0.367	0.881	0.375	0.267	0.62	0.383	0.726	0.353	0.534
FC4	0.55	0.502	0.548	0.106	0.602	0.352	0.793	0.366	0.315	0.537	0.33	0.631	0.326	0.566
GR1	0.403	0.651	0.467	0.19	0.263	0.176	0.396	0.936	0.555	0.323	0.573	0.408	0.544	0.535
GR2	0.419	0.68	0.435	0.22	0.294	0.191	0.395	0.931	0.52	0.298	0.503	0.332	0.541	0.559
GR3	0.508	0.66	0.457	0.203	0.323	0.315	0.439	0.863	0.502	0.338	0.565	0.434	0.575	0.544

ID1	0.233	0.405	0.308	0.198	0.143	0.169	0.264	0.467	0.898	0.199	0.418	0.246	0.484	0.439
ID2	0.272	0.427	0.438	0.306	0.227	0.182	0.344	0.452	0.92	0.227	0.457	0.329	0.502	0.482
ID3	0.403	0.485	0.45	0.204	0.269	0.196	0.359	0.604	0.847	0.227	0.56	0.366	0.56	0.542
PE1	0.414	0.384	0.473	0.224	0.743	0.216	0.616	0.294	0.15	0.884	0.272	0.579	0.204	0.379
PE2	0.398	0.409	0.541	0.26	0.738	0.233	0.663	0.289	0.221	0.915	0.218	0.629	0.23	0.385
PE3	0.314	0.483	0.451	0.142	0.512	0.324	0.515	0.347	0.284	0.826	0.202	0.47	0.339	0.277
RO1	0.489	0.556	0.482	0.184	0.364	0.178	0.426	0.568	0.562	0.252	0.958	0.466	0.705	0.639
RO2	0.512	0.627	0.37	0.036	0.344	0.188	0.418	0.571	0.46	0.244	0.928	0.369	0.673	0.67
SI1	0.56	0.588	0.641	0.218	0.654	0.448	0.734	0.375	0.308	0.614	0.408	0.924	0.411	0.461
SI2	0.545	0.501	0.638	0.246	0.667	0.41	0.737	0.434	0.336	0.604	0.379	0.942	0.335	0.477
SI3	0.601	0.536	0.694	0.208	0.655	0.39	0.774	0.406	0.372	0.592	0.47	0.946	0.415	0.52
SO1	0.485	0.641	0.38	0.012	0.252	0.181	0.332	0.555	0.535	0.212	0.739	0.321	0.871	0.563
SO2	0.507	0.616	0.5	0.086	0.319	0.207	0.341	0.552	0.536	0.329	0.589	0.382	0.92	0.586
SO3	0.546	0.652	0.463	0.072	0.299	0.251	0.398	0.556	0.53	0.24	0.691	0.417	0.935	0.654
VA1	0.518	0.56	0.53	0.125	0.346	0.189	0.509	0.559	0.554	0.323	0.652	0.487	0.678	0.812
VA2	0.636	0.582	0.428	0.198	0.474	0.282	0.535	0.528	0.482	0.315	0.629	0.413	0.571	0.886
VA3	0.679	0.564	0.466	0.245	0.51	0.276	0.588	0.426	0.362	0.371	0.461	0.407	0.41	0.843

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Exploring Gender Differences in Shaping Total Tourism Experience Quality among Eco-Tourists

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Abstract: This research explored the role of gender as a moderating effect on the relationship between factors affecting ecotourism experiential value. Previous studies have investigated tourist satisfaction; however, the role of gender towards the experiential value remains unclear. More importantly, the tourist's actual behavior at a destination is a critical determinant factor of tourist loyalty compared to the perception. Accordingly, the purpose of this study was to explore the role of gender in the relationship between factors influencing the Ecotourist Experiential Value on Actual Tourist Behaviour. More specifically, this study delved into the consequences of destination experience (i.e. attachment and advocate) and investigated the influence of Ecotourist Experiential Value on Actual Behaviour between genders. A survey was conducted among the Taman Negara patrons in Malaysia. The research model was tested and confirmed with 243 tourists. The data was analyzed using Smart Partial Least Squares which is the variance-based structural equation modelling. The results evoked from the survey indicate that aesthetics is very much important as the influential factors towards positive total experience quality among male compared to female. In contrast, Customer Return on Investment becomes the main concern of female tourists towards Total Experience Quality as compared to male tourists. In light of the major finding, this study accentuates the importance of understanding gender behavior to provide valuable insights for destination marketers to establish positioning plans for the tourism industry.

Keywords: *Ecotourism, Experiential value, Advocate, Attachment, Multigroup Analysis*

1. Introduction and Background

In the past few decades, the tourism sector has developed into one of the most substantial sources of external income (Adil, Nasir, & Kumar, 2021a, Adil et al., 2021b). As one of the most significant sectors nowadays (Tasia & Yasri, 2021), the tourist experience has concerned a lot of study consideration in the extent of tourism studies (Chakraborty, Adil, & Sadiq, 2023), with the notion of memorable tourism experiences (MTEs) (Zhong et al., 2017). A study by Kim, Ritchie, and McCormick (2012) explains that "an MTE is selectively constructed from tourism experiences based on the individual's assessment of the experience". Similarly, previous studies also state that MTEs are the concept that defines the "experience economy", emphasizing the significance of experience in the tourism sector (Zhou et al., 2022a, 2022b). Furthermore, ecotourism' has been defined as a "*practice of traveling to relatively less exploited natural destinations to appreciate the natural settings, acquire knowledge about wildlife and enjoy local cultures in authentic settings while conserving the environments of the destinations*" (Khanra et al., 2021). In other words, ecotourism is a subsector of tourism that is exceptional and portrays ethical meanings, care for the environment and its effect on them (Ansari et al., 2022; Fennell, 2001; Rafiq et al., 2022a, 2022b; Sadiq & Adil, 2021). Instead, 'ecotourism experience' is "*a subjective phenomenon, which involves visitors' experience of interacting with the firms/nature at 'pre-visit', 'on-site visit' and 'post-visit' of ecotourism sites*." This will support in considering the intricate nature of the tourist experience that varies with diverse phases of consumption (Godovykh & Tasci, 2020). In reality, ecotourism experiences differ liable on the destination and/or activities.

Ecotourism can be considered one of the vital subsectors of tourism in Malaysia that has been recognized by the Malaysian government. Based on past research, about 35% of visitors from developing countries came to Malaysia because of its tourist sites attraction (The Star, 2003). The increasing trend in ecotourism is related to the shifting of consumer affection for retreats, especially in their curiosity towards nature-based vacations. They have confidence that these sorts of holidays afford them educational experience engagement and also improve their environment and social accountability as a traveller (Parks, Parks and Allen, 2009). In the

Malaysian setting, ecotourism is defined as, "*travel and visitation that is environmentally responsible to relatively undisturbed natural areas to enjoy and appreciate nature (including any accompanying cultural features; both past and present), promotes conservation, has low visitor impact and provides for beneficially active socioeconomic involvement of local populations"* (World Wide Fund for Nature Malaysia. 1996). There is quite a wide-ranging ecotourism literature that permits evidence relating to the development and management of eco-tourists profiles, expectations, satisfaction, and motivation (Musa et al, 2010; Palacio & McCool, 1997; and William, 1992). Nevertheless, there is slight empirical evidence in the literature that studies indirect predictors of experiential value related to ecotourism and its significance. Still, empirical studies on 'ecotourism' and 'customer experience' have progressively improved over the past twenty years, existing literature on 'ecotourism experience' appears to be mostly uneven and disjointed. For example, Godovykh and Tasci (2020) measured 'customer experience' as a whole, observing the general tourism experience that confines the scope of their results. Likewise, Liu and Li (2020) and Khanra et al. (2021) studied ecotourism research trends over bibliometric analysis, nonetheless mostly ignored the experiences of ecotourists.

Recently, the significant role of experiential value has been recognized by researchers (Mathwick, Malhotra and Rigdon; 2001), and the overall customer experience has inclined the customer loyalty level (Berry, Carbone & Haeckel, 2002; Mascarenhas, Kesavan & Bernacchi, 2006; and Musa, Putit & Kassim, 2009) Consequently, marketing trend has transformation beyond the customer loyalty in this globalization era, then further into producing the attractive experience that is be certain of last longer for the customer (Pine & Gilmore, 1999). This study intends to explore gender differences as a moderating effect in determining total experience quality in eco-tourism.

2. Literature Review

Previously, the world economy was mostly grounded on products and services, but nowadays the phenomenon has transformed a lot. Nowadays, experience is an important substance for users (Oh, Fiore & Jeong, 2007, Kim, Ritchie & McCormick, 2012). Thus, a memorable quality experience will have a positive effect on a business. Many studies have been done in the context of retailing and hospitality, which have taken into account the issues of experience, but studies in the context of tourism are still very limited, except the study by Oh, Fiore and Jeong (Oh, Fiore & Jeong, 2007).

This study was carried out using environmental psychology theory, which was accepted by many researchers, namely the S-O-R model by Mehrabian-Russell (Mehrabian & Russell, 1974). They assume that the relationship between the three variables is a stimulus-organism reaction.

Ecotourism Experiential Value (EEV): Customers are looking more toward the value they will receive, the options being offered, and the experience they gain. From the retailing point of view (Keng, Huang, Zheng & Hsu, 2007; Mathwick, Malhotra & Rigdon, 2001) experience in the services sector plays a very critical and important role. Therefore, retailers need to focus on providing the environment with fun elements, entertainment with fun and promoting greater participation among consumers. In this research, experimental value means 'Preferred, relativistic priority for product characteristics or service performance that yield from interactions in usage settings that facilitates or obstructs the achievement of customer goals" (Mathwick, Malhotra & Rigdon, 1997) And in the context of this research also, the value concept of ecotourism experience (EEV) is seen as a beneficial when it involved in ecotourism product offerings and services. These EEV estimates will be based on the value of the ecotourist gained. The enrichment of knowledge when visiting this ecotourism spot and feeling the excitement deviates to a new one when immersed in the ecotourism environment Bitner, W. Faranda, A. Hubbert, and V. Zeithaml, 1997; Pine & Gilmore, 1999). EEV is conceptualized as an experience-based value consisting of aesthetics, excellent service, social, return on customer investment, education component and escapism; hence it is a hierarchical model. Bitner and Brown (2000) suggest that the level of experience value utilization can affect customer satisfaction and subsequently loyalty.

Total Ecotourist Experience Quality (TEQ): Literature is very limited in the field of research that engages the customer experience as the concept since it is new and has begun to gain a lot of attention through the study of Macarenhas, Kesavan and Bernacchi (2006) [9]. Many researchers have emphasized the importance of overall customer experience, as it will lead to lasting loyalty. Researchers also agreed that 'emotional

involvement' is also very important in all interactions between customers and sellers. They practice the total customer experience as a truly positive, interesting, enduring and social experience physically and emotionally across all major stages of one's consumption chain (Mascarenhas, Kesavan & Bernacchi, 2006). Customer experience is conceptualized as a customer affective response (attachment, advocate) when engaging and taking the offering of products and services. On the other hand, the quality of the experience is seen as the excellence or superiority of experience (Lemke, Clark & Wilson, 2010). The quality of experience in the ecotourism context revolves around every touch point during interaction with service providers and travel sites. It can be said that affective or emotional elements form the basis for evaluating the quality-of-service experience. In conclusion, this study focuses on the overall quality of customer experience and stimulus to respond to the sense of being served and maintained by its expectations or standards, throughout the holistic journey of consuming the ecotourism experience.

Aesthetics and Total Experience Quality: Aesthetics in tourism includes the sensory experiences resulting from the environment, architecture, art, and overall environment of a destination. According to Agapito, Valle, and Mendes (2020), aesthetics contributes meaningfully to generating unforgettable tourist experiences by engaging the senses, which in turn affects emotional responses and satisfaction levels. The study emphasizes those destinations with well-curated aesthetic elements, such as art installations, architectural beauty, and natural landscapes, enhance the sensory appeal and contribute to the overall positive perception of the destination. Furthermore, Kim and Kim (2019) highlight the importance of aesthetic value in heritage tourism. Their research displays that aesthetic gratitude for cultural heritage sites not only enhances tourists' satisfaction but also nurtures a deeper emotional connection with the destination. This connection is principally important in the context of cultural and heritage tourism, where the aesthetic experience is frequently secured to the historical and cultural significance of the site.

Total experience quality refers to the inclusive valuation of all aspects of a tourist's experience, together with service quality, environmental factors, and personal interactions. Current studies have shifted focus from individual elements of service quality to a more holistic understanding of the tourist experience. For example, Tsaur, Yen, and Yan (2018) claim that total experience quality covers both tangible and intangible elements, for instance, the emotional and psychological effects of the tourist experience. Their study proposes that destinations that prioritize a holistic approach to experience quality, integrating aesthetics, service, and emotional engagement, are more likely to accomplish high levels of tourist satisfaction and loyalty. A comparable study by Ali, Ryu, and Hussain (2018) underlines the part of experiential factors, as well as aesthetics, in enhancing total experience quality. The study finds that tourists' perceptions of beauty, design, and atmosphere meaningfully affect their total gratification and inclination to endorse the destination. This discovery brings into line with the larger understanding that total experience quality is a complex concept, where aesthetics plays a critical role.

The relationship between aesthetics and total experience quality is multifaceted and complex. According to a study by Oh, Fiore, and Jeong (2020), aesthetic experiences act as a mediator between service quality and overall satisfaction. The study highlights that the aesthetic appeal of a destination increases the apparent value of the experience, leading to higher satisfaction levels. This mediating role of aesthetics proposes that destinations that capitalize on creating aesthetically attractive environments can significantly increase their overall experience quality. Additionally, current research by Sthapit and Jiménez-Barreto (2019) discovers the role of co-creation in enhancing aesthetic experiences and total experience quality. The study suggests that when tourists are actively involved in the creation of their experiences, mainly in aesthetically rich environments, their overall satisfaction and perception of quality increase. This partaking approach not only improves the aesthetic value but then again also contributes to a more personalized and memorable experience.

Service Excellence and Total Experience Quality: Service excellence is a key driver of achievement in the tourism sector, impelling both customer satisfaction and competitive advantage. Based on Martínez and Del Bosque (2021), service excellence includes some dimensions, comprising reliability, responsiveness, empathy, assurance, and tangibles. These dimensions contribute to a whole service experience that can meaningfully strengthen the perceived quality of a tourism experience. In addition, a Study by Wu and Ko (2020) focuses on the significance of personalized service in achieving service excellence in tourism. The study showed that

personalization-adapting services to meet individual customer needs play a fundamental part in creating memorable experiences. This study recommends that service excellence is not just about high-quality service delivery but also about creating a unique and personalized experience for each customer. Furthermore, Kabadayi, Ozturk, and Bilgihan (2022) emphasize the role of digital technologies in improving service excellence. They discovered in what way the integration of technology in service delivery, for example, mobile apps and artificial intelligence, can develop service efficiency and customer satisfaction. The study claims that digital transformation in tourism services is essential for supporting service excellence in a fast-developing sector.

The relationship between service excellence and TEQ is well recognized in the literature, with many findings demonstrating that high levels of service excellence indicate higher TEQ. A study by Lee, Lee, and Choi (2020) studied the effect of service excellence on TEQ from the perspective of luxury hotels. Results establish that exceptional service quality, specifically in terms of responsiveness and empathy, considerably improves the overall quality of the guest experience, leading to higher satisfaction and loyalty. Likewise, Xu, Huang, and Su (2022) investigated the relationship between service quality and TEQ from the perspective of cultural tourism. Their results identify that service excellence in the areas of guiding services, cultural interpretation, and customer care significantly contributes to a positive overall experience. Furthermore, Kwon, Yoon, and Kim (2021) establish that engaged and motivated employees are more prone to deliver superior service, which in turn increases the overall experience quality.

The results from the current study have important effects on tourism management and service delivery. To attain service excellence and improve TEQ, the tourism sector must emphasize continuous training and development of their employees to ensure high levels of service quality. Personalized service, enabled by digital technologies, can also play a crucial role in creating memorable experiences for tourists (Wu & Ko, 2020). Furthermore, tourism businesses should deliberate incorporating customer feedback into their service improvement strategies to ensure that the services offered associate with customer expectations and contribute positively to TEQ. Ritchie and Hudson (2019) highlighted that understanding the factors that influence TEQ can assist businesses plan better experiences that boost customer satisfaction and loyalty.

Social and Total Experience Quality: Social interactions are a main factor in the tourism experience, impelling tourists' perceptions, satisfaction, and behavioral intentions. Cohen and Cohen (2019) explained that social interactions in tourism could be considered into three main categories: interactions with service providers, interactions with other tourists, and interactions with local communities. Each of these interactions contributes differently to the overall experience quality. Research by Wu, Li, and Park (2020) highlights the significance of positive social interactions with service providers in improving tourists' satisfaction and loyalty. Their analysis discovered that personalized and friendly interactions with staff significantly increase the perceived quality of the experience, leading to higher levels of satisfaction.

In addition, a study by Kim, Song, and Choe (2021) discovered the role of socialization in tourists' in-group travel situations. The analysis discovered that positive interactions and shared experiences among group members lead to a more enjoyable and memorable experience, improving the overall quality of the trip. This research highlights the importance of social bonds and communal experiences in tourism. Also, social interactions with local communities play an important role in TEQ. Hwang, Baloglu, and Choi (2022) explained that engaging with locals and partaking in cultural activities provide tourists with a greater understanding of the destination, leading to a more authentic and fulfilling experience. This report proposes that meaningful interactions with local communities can improve the emotional and cultural dimensions of the tourism experience and contribute to higher TEQ.

Research by Wang, Zhang, and Li (2020) studied the effect of social interactions on TEQ in the context of cultural tourism. They establish that meaningful interactions with local communities, such as participating in traditional ceremonies or festivals, significantly improve TEQ in offering tourists authentic and culturally amusing experiences. Likewise, research by Lee and Kim (2021) investigated the role of social interactions in luxury tourism. They discovered that personalized service and attention from staff, accompanied by positive interactions with other guests, contribute to a higher overall experience quality. This study underlines the significance of social interactions in producing a sense of exclusivity and personalized attention, which are the

main mechanisms of luxury tourism experiences. Besides that, in terms of adventure tourism, social interactions also play a vital role in determining TEQ. A study by Park, Lee, and Hwang (2022) showed that social interactions among participants in adventure activities, for example, group hiking or white-water rafting, improve the overall experience by nurturing a feeling of comradeship and shared achievement. This analysis indicates that social bonds and group dynamics are significant elements in shaping TEQ in adventure tourism settings.

The relationship between social factors and TEQ has important effects on tourism management and service delivery. Tourism businesses should emphasis on aiding positive social interactions between tourists, service providers, and local communities to improve TEQ. For instance, training employees to provide personalized and friendly service can increase the quality of interactions with tourists, leading to higher satisfaction and loyalty (Wu et al., 2020). Furthermore, tourism operators must deliberate producing opportunities for tourists to engage with local communities and participate in cultural activities. By promoting authentic and meaningful interactions, businesses can enhance the emotional and cultural dimensions of the experience, contributing to higher TEQ (Hwang et al., 2022). Marketing strategies should also highlight the social aspects of the tourism experience, emphasizing the chances for socialization, cultural exchange, and personalized service. By encouraging these components, tourism businesses can attract tourists who value social interactions and obtain a high-quality overall experience (Kim et al., 2021).

Customers' Return on Investment and Total Experience Quality: Customers' ROI in the tourism sector is complex, concerning financial, emotional, and experiential returns. Conventionally, ROI has been assessed based on the cost-benefit analysis of tourism investments from a business viewpoint. Nevertheless, from a consumer viewpoint, ROI is more subjective and tangled to the overall satisfaction and perceived value of the tourism experience. According to a study by Lee and Xue (2019), tourists reflect not only the direct financial costs but also the emotional satisfaction and the quality of the experiences when estimating their ROI. The research showed that the perceived value of the experience, when it surpasses the cost, improves customer satisfaction and raises the probability of recurrence visits (Lee & Xue, 2019).

Experience quality is a critical element of perceived ROI in tourism. Experience quality states the overall assessment of the tourism experience, including service quality, destination attributes, and personal interactions. A study by Ali, Hussain, and Raghavan (2020) highlights that high-quality experiences lead to higher perceived ROI among tourists. The study shows that when tourists perceive that they have received high-quality service, enjoyed unique attractions, and had meaningful interactions, they are more likely to feel that their investment was valuable. This sense of value improves their overall satisfaction and increases their willingness to return or recommend the destination to others (Ali et al., 2020).

Emotional and psychological returns are also important mechanisms of customers' ROI in tourism. These returns are regularly resulting from the feelings of joy, relaxation, and personal growth that tourists experience during their travels. A study by Zhang, Zhang, and Li (2021) discovered the relationship between emotional experiences and perceived ROI in luxury tourism. The results propose that tourists who experience strong positive emotions, such as happiness and contentment, during their trips report a higher ROI, although the financial costs are large. This underlines the importance of making emotionally appealing experiences to improve perceived ROI (Zhang et al., 2021).

Besides that, cultural and educational experiences also play a substantial role in shaping customers' ROI in tourism. Tourists who are involved in culturally inspiring activities or educational programs regularly perceive a higher ROI because these experiences offer lasting benefits, for example, increased knowledge and personal growth. According to a study by Packer and Ballantyne (2019), tourists who join educational tours or cultural exchanges report a higher perceived ROI, as these experiences contribute to their personal development and offer unique, memorable experiences. The study highlights that destinations offering educational and cultural experiences can improve tourists' perceived ROI, leading to greater satisfaction and recurrence visits (Packer & Ballantyne, 2019).

The literature indicates that the perceived ROI in tourism is closely linked to the total experience quality. High-quality experiences, particularly those that offer emotional, cultural, and educational value, significantly

enhance tourists' perceptions of ROI. This suggests that tourism providers should focus on delivering exceptional experience quality to ensure that customers feel their investment in travel is worthwhile, leading to higher satisfaction and loyalty.

Educational and Total Experience Quality: Educational tourism, a niche segment within the larger tourism sector, highlights the learning aspect of travel. It comprises activities for instance cultural tours, historical site visits, language immersion programs, and other forms of travel where education is a main goal. According to a study by Ritchie and Crouch (2020), the addition of educational content in tourism improves the intellectual engagement of tourists, leading to higher satisfaction levels and perceived value of the experience. The study illustrates that educational tourism not only improves the tourists' knowledge but also deepens their emotional connection to the destination, which is a significant contributor to overall experience quality (Ritchie & Crouch, 2020). Furthermore, heritage tourism is another area where education plays a critical role in determining the total experience quality. Interpretation, as a form of educational delivery in heritage sites, has been shown to significantly influence tourists' experiences. A study by Zhang et al. (2019) found that well-designed interpretive programs at heritage sites enhance visitors' understanding and appreciation of the cultural significance of the site, which in turn increases their overall satisfaction. The research suggests that when tourists feel they have gained new knowledge or insights from their visit, their perception of the quality of the experience is elevated (Zhang et al., 2019).

The concept of experiential learning in sustainable tourism is another area of interest. Experiential learning encompasses active participation in meaningful activities, where tourists learn through direct experience. A study by Packer and Ballantyne (2018) explored the impact of experiential learning programs on tourists' environmental awareness and overall experience quality. The study concluded that tourists who engage in experiential learning activities, such as eco-tours or conservation projects, report higher satisfaction levels and a stronger commitment to sustainable practices post-visit. This suggests that education, when integrated into tourism experiences, not only enhances the immediate quality of the experience but also promotes long-term positive outcomes (Packer & Ballantyne, 2018). Museums and cultural institutions are major examples of venues where education directly affects the total experience quality of visitors. Falk and Dierking (2019) examined the relationship between educational content delivery and visitor satisfaction in museum situations. Their study shows that interactive and engaging educational exhibits meaningfully improve the overall visitor experience. The study found that when visitors are actively involved in the learning process, they are more likely to have a positive and memorable experience, which enhances the perceived quality of their visit (Falk & Dierking, 2019).

Recent literature underscores the significant impact of education on the total experience quality in tourism. These findings suggest that integrating educational components into tourism experiences is a valuable strategy for improving overall experience quality and fostering deeper connections between tourists and destinations.

Escapism and Total Experience Quality: Escapism is a psychological concept that has long been related to tourism. It indicates the need to momentarily leave behind the routine, stress, and demands of everyday life in pursuit of leisure and freedom. As said by Kim, Lee, and Uysal (2019), escapism is one of the main reasons for travel, driving individuals to seek out new environments, activities, and experiences that offer a mental and emotional respite. Chen, Lin, and Kuo (2020) highlight the role of escapism in adventure and nature-based tourism where tourists requesting escape through adventure activities, such as hiking or diving, often experience a heightened sense of freedom and thrill, which considerably contributes to their overall satisfaction and well-being. The analysis also notes that the desire for escapism is narrowly related to the search for novelty and excitement, which are the main factors of the tourism experience. Besides, escapism has been discovered to influence the choice of destination and type of tourism. For example, a study by Wang, Li, and Song (2021) discovers the role of escapism in luxury tourism, where tourists look for exclusive and tranquil environments that offer a break from their chaotic lifestyles. The analysis implies that the desire to escape is an important aspect of the choice of high-end resorts and destinations that promise peace, privacy, and comfort.

In addition, a study by Lee, Lee, and Choe (2021) investigates the effect of escapism on TEQ in the aspect of wellness tourism. Tourists who requested escape through wellness activities, for example, spa treatments and meditation, testified higher levels of emotional satisfaction and overall experience quality. This recommends

that escapism can improve the emotional and psychological dimensions of TEQ. Relatedly, a study by Lin, Wu, and Tsai (2022) inspects the role of escapism in cultural tourism. The analysis initiated that tourists who engaged in cultural activities as a form of escapism, for example visiting museums or attending traditional festivals, experienced a deeper feel of completion and satisfaction. The study focuses on the cultural immersion afforded by these activities permits tourists to disengage from their normal environments and engage in meaningful and enriching experiences, thus improving TEQ. Also, research by Huang, Liu, and Li (2022) discovers the effect of escapism on TEQ in the setting of adventure tourism. The analysis establishes that the adventure and thrill accompanying adventure activities, for example, skydiving or white-water rafting, meaningfully contribute to the overall quality of the experience. The study recommends that the feeling of liberty and excitement provided by these activities fill the escapist desires of tourists, leading to higher TEQ.

Tourism operators should consider incorporating elements of escapism into their service offerings to cater to the emotional and psychological needs of tourists. For example, designing experiences that allow tourists to disconnect from their routine and immerse themselves in novel and exciting activities can enhance TEQ and lead to higher levels of satisfaction and loyalty (Chen et al., 2020). Moreover, marketing strategies should emphasize the escapist potential of tourism experiences, highlighting the mental and emotional benefits of travel. By promoting services that offer a break from the mundane, tourism businesses can attract tourists seeking escapism and enhance their overall experience quality (Wang et al., 2021).

Total Experience Quality and Attachment: Attachment in tourism is often studied through the lens of "place attachment," a psychological concept that defines the attachment between people and specific locations. Place attachment is multidimensional, encompassing emotional, functional, and symbolic relations to a place (Lewicka, 2019). Current findings have highlighted that place attachment is critical in determining tourist behavior, comprising repeat visitation, loyalty, and word-of-mouth recommendations. For example, a report by Ramkissoon, Smith, and Weiler (2019) discovers how place attachment affects environmental behaviors in ecotourism settings. They establish that tourists with strong emotional connections to a place are more likely to engage in pro-environmental behaviors, implying that attachment can improve the overall quality of the experience by nurturing a sense of responsibility and care for the destination.

Besides, Prayag et al. (2020) studied the role of place attachment in improving tourists' emotional experiences. Their results propose that strong place attachment can meaningfully intensify the positive emotions experienced during a trip, leading to a higher perception of TEQ. The relationship between attachment and TEQ is multifaceted and complex. Research implies that attachment can both directly and indirectly influence TEQ. A study by Zhang, Wu, and Buhalis (2022) discovered how place attachment mediates the relationship between experience quality and tourist satisfaction. They discovered that tourists with strong place attachments are inclined to sense higher TEQ, which in turn leads to greater satisfaction and loyalty. Furthermore, Yuksel, Yuksel, and Bilim (2020) recommend that attachment can act as a moderating factor in the relationship between TEQ and behavioral intentions, such as revisiting intentions and positive word-of-mouth. Their study displays that the stronger the attachment, the more likely tourists are to overlook minor flaws in the experience, thereby maintaining a high perception of TEQ.

Destination marketers can leverage place attachment by creating and promoting experiences that foster emotional connections with the destination. For instance, offering personalized services, emphasizing local culture, and ensuring environmental sustainability can enhance both attachment and TEQ (Zhang et al., 2022). Additionally, tourism operators can focus on creating memorable experiences that resonate emotionally with tourists, as this can lead to stronger attachment and higher TEQ. As suggested by Ramkissoon et al. (2019), encouraging responsible tourism behaviors can also strengthen the bond between tourists and the destination, contributing to a higher overall quality of experience.

Total Experience Quality and Advocate: Advocate behavior means the willingness of customers to recommend a destination or service to others, often seen as an expression of customer loyalty. Advocacy goes afar satisfaction, as it includes aggressively encouraging the service or destination to others. Current findings have focused on finding the backgrounds of advocate behavior in tourism. For example, Lu et al. (2021) discovered the relationship between destination image, service quality, and advocate behavior in the context of cultural tourism. They discovered that a positive destination image and high service quality significantly

enhance tourists' likelihood of advocating for the destination. Likewise, Rahman et al. (2022) studied the influence of emotional experiences on advocacy, exhibiting that tourists who have emotionally engaging and positive experiences are more likely to recommend the destination to others.

The relationship between advocate behavior and TEQ is vital for understanding how an inclusive and high-quality experience can lead to active promotion by tourists. Findings have recommended that TEQ act as a precursor to advocacy, as tourists who experience high-quality service across all dimensions are more likely to engage in advocate behavior. A study by Lee et al. (2020) underlined the direct impact of TEQ on advocacy in the context of luxury tourism. They establish that tourists who perceive high TEQ are not only more satisfied but also more likely to recommend the luxury destination to others, thus acting as advocates. Likewise, Al-Ansi and Han (2021) focused on the role of cultural and environmental factors in shaping TEQ and, subsequently, advocating behavior. They concluded that destinations that excel in delivering a holistic and high-quality experience are more likely to see their visitors become advocates.

Gender and Total Experience Quality: The recent study debates that gender forms the relationships between destination service quality (DSQ), destination affective image (DAI), and revisit intention (Tosun, Dedeoglu & Usakli, 2024). Undeniably, both the agency–communion theory and the empathizing–systemizing theory propose that the attitudes and behaviors of females and males can differ based on their social identities and biological structures (Bakan, 1966; Greenberg & Baron-Cohen, 2020). Earlier research has established that this variation is also apparent in consumption habits. Consistent with this, the tourism literature discloses that the factors influencing the attitudinal loyalty of tourists may vary depending on their gender (Boo et al., 2013; Dedeoğlu et al., 2016; Suki, 2014; Yang et al., 2022). Nonetheless, it is worth noticing that studies on how gender shapes the effect of DSQ on DAI and revisits intention is limited (Aliedan et al., 2021; Dedeoglu, 2019; Dedeoğlu et al., 2016), representing a significant gap in the literature. This study mainly pursues to address this research gap and extend the remaining body of research in tourism by examining how gender moderates the relationships among DSQ, DAI, and tourists' revisit intention. Highlighting the role of gender in shaping DSQ, DAI, and revisit intention can afford a deeper understanding of personalized marketing strategies that boost visitor loyalty.

Besides that, a study by Tosun, Dedeoglu & Usakli, (2024) examines the moderating role of gender on the relationships between destination service quality, affective image, and revisit intention. The results show that "*accommodation*, *local transport*, *hospitality,* and *airport services*" have positive effects on affective image, and affective image, in turn, positively influences revisit intention. The study also discloses three significant results concerning the moderating role of gender. Whereas the positive impact of *hospitality* on the affective image was found to be stronger for female visitors, the positive impacts of *local transport* and *airport services* on the affective image were found to be stronger for male visitors.

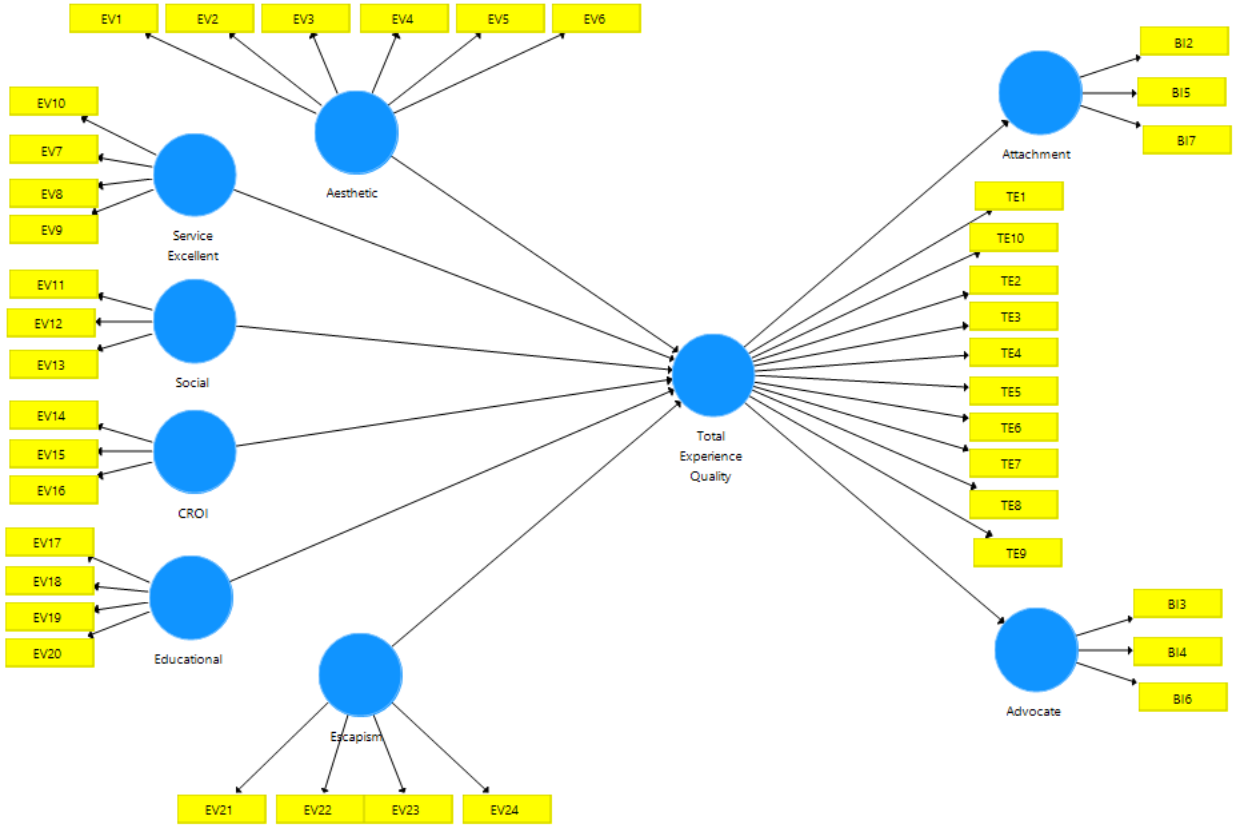
Figure 1 signifies the conceptual framework between factors affecting Total Experience Quality and further influencing the attachment and advocate. Thus, the study hypothesizes:
H1: There was a significant positive relationship between Aesthetic and Total Experience Quality
H2: There was a significant positive relationship between Service Excellent and Total Experience Quality
H3: There was a significant positive relationship between Social and Total Experience Quality
H4: There was a significant positive relationship between CROI and Total Experience Quality
H5: There was a significant positive relationship between Educational and Total Experience Quality
H6: There was a significant positive relationship between Escapism and Total Experience Quality
H7: There was a significant positive relationship between Total Experience Quality and Attachment
H8: There was a significant positive relationship between Total Experience Quality and Advocate

3. Research Methodology

Questionnaires are developed by adapting previous research done to suit the current study. The findings from the focus group sessions are also taken into consideration. The process is then followed by an interview session and validation of the questionnaire with two industry personnel in the eco-tourism and also professors who are experts in the area of study.

Data were then collected at Taman Negara in Malaysia. 243 respondents completed the questionnaire and deemed it to be valid. Respondent ranges from age above 20 to 60 years old. Since this is an exploratory study, therefore these usable data were then analyzed using Smart Partial Least Squares (SmartPLS) version 4.1.0.6.

Figure 1: Conceptual Framework



4. Results

Validity was measured by using two criteria, which were convergent validity and discriminant validity. Convergent validity consists of factor loadings, average variance extracted (AVE) and composite reliability (CR) as in Table 1. Within this study, the factor loadings mostly exceeded 0.620 at the acceptance rate of 0.6 (Hair, Hult, Ringle & Sarstedt, 2017). The factor loadings ranged from 0.625 to 0.935. The AVE of the result indicates that all the variables have a value greater than 0.5, which means that less error remains (Hair, Babin & Anderson, 2010). The highest AVE is CROI which is 0.801 followed by Escapism 0.682. The lowest AVE is Advocate, which is 0.530. While the lowest CR value was 0.771, which was above the cut-off point of 0.7 (Hair, Hult, Ringle & Sarstedt, 2017). Based on Table 1, it is initiated that all of the AVE and CR values are more than 0.5 and 0.7 respectively.

While discriminant validity using the Heterotrait-monotrait ratio (HTMT) is summarized in Table 2. HTMT analysis summarized in Table 2 also showed that all the values are below 0.90. Hence, all variables achieved reliable and valid results (Hair, Hult, Ringle & Sarstedt, 2017).

Discussion

The results shown in Table 3 indicate that gender moderates the relationship between Aesthetics and CROI toward Total Experience Quality, where Aesthetics is the main concern for male tourists with a significant positive relationship at a 99% confidence level toward Total Experience Quality. Meanwhile, CROI is the main concern for female tourists with a significant positive relationship at a 95% confidence level toward Total Experience Quality. The findings are consistent with studies by Boo et al., (2013), Dedeoğlu et al., (2016),

Suki, (2014) and Yang et al., (2022). Unexpectedly, contradicting previous studies, Service Excellent, Social and Escapism did not influence their total experience quality for both genders.

Table 1: Convergent Validity (Factor Loadings, CR and AVE)

Construct	Items	Factor Loadings	Composite Reliability (CR)	Average Variance Extracted (AVE)	R-square
Attachment	BI2	0.791	0.837	0.632	0.206
	BI5	0.767			
	BI7	0.825			
Advocate	BI3	0.805	0.771	0.530	0.265
	BI4	0.639			
	BI6	0.732			
Aesthetic	EV1	0.785	0.920	0.657	
	EV2	0.803			
	EV3	0.748			
	EV4	0.867			
	EV5	0.861			
	EV6	0.791			
Service Excellent	EV7	0.863	0.879	0.648	
	EV8	0.866			
	EV9	0.781			
	EV10	0.697			
Social	EV11	0.858	0.839	0.641	
	EV12	0.908			
	EV13	0.603			
CROI	EV14	0.847	0.924	0.801	
	EV15	0.928			
	EV16	0.909			
Educational	EV17	0.742	0.876	0.640	
	EV18	0.809			
	EV19	0.850			
	EV20	0.795			
Escapism	EV21	0.816	0.895	0.682	
	EV22	0.815			
	EV23	0.837			
	EV24	0.834			
Total Experience Quality	TE1	0.788	0.949	0.651	0.401
	TE2	0.860			
	TE3	0.796			
	TE4	0.774			
	TE5	0.785			
	TE6	0.793			
	TE7	0.835			
	TE8	0.846			
	TE9	0.794			
	TE10	0.793			

Table 2: Discriminant Validity

Construct	1	2	3	4	5	6	7	8	9
Advocate (1)									
Aesthetic (2)	0.694								
Attachment (3)	0.891	0.545							
CROI (4)	0.636	0.577	0.472						
Educational (5)	0.421	0.467	0.500	0.431					
Escapism (6)	0.560	0.665	0.629	0.567	0.579				
Service Excellent (7)	0.581	0.564	0.392	0.616	0.414	0.519			
Social (8)	0.416	0.525	0.337	0.446	0.652	0.405	0.437		
Total Experience Quality (9)	0.660	0.583	0.546	0.489	0.534	0.415	0.408	0.489	

Table 3: Multigroup Structural Analysis (Comparison between Male and Female)

		Std Beta (Male)	Std Beta (Female)	t-value (Male)	t-Value (Female)	p-Value (Male)	p-Value (Female)
H1	**Aesthetic -> Total Experience Quality**	0.485***	0.176*	7.043	1.821	0.000	0.069
H2	**Service Excellent -> Total Experience Quality**	0.077	-0.036	0.801	0.490	0.423	0.624
H3	**Social -> Total Experience Quality**	0.004	0.172	0.057	1.618	0.954	0.106
H4	**CROI -> Total Experience Quality**	0.132*	0.234**	1.657	2.028	0.098	0.043
H5	**Educational -> Total Experience Quality**	0.223***	0.296***	3.036	4.257	0.002	0.000
H6	**Escapism -> Total Experience Quality**	-0.019	-0.068	0.208	0.681	0.835	0.496
H7	**Total Experience Quality -> Attachment**	0.473***	0.506***	6.128	7.085	0.000	0.000
H8	**Total Experience Quality -> Advocate**	0.545***	0.518***	6.594	7.520	0.000	0.000

*** indicates significance at a 99% confidence level
** indicates significance at a 95% confidence level
* indicates significance at a 90% confidence level

It is also found that education is a factor that affects Total Experience Quality for both male and female tourists with a positive relationship at a 99% confidence level toward Total Experience Quality. Besides that Total Experience Quality was found to have a significant positive impact on Attachment and Advocate for both male and female tourists with a significant positive relationship at a 99% confidence level.

5. Managerial Implications and Recommendations

This study found gender roles in factors affecting the total experience quality of tourists particularly in the eco-tourism industry. Thus, it is recommended that the service provider of the eco-tourism industry highlight aesthetics in attracting male tourists while focusing on customer return on investment in influencing female tourists. In addition, in targeting both male and female tourists, the service provider of the eco-tourism industry might highlight on educational aspect.

Since this study is limited to forest nature eco-tourism in Taman Negara, future study is recommended to observe another type of Eco-Tourism such as marine eco-tourism to get further validation on gender roles towards the relationship between factors affecting Total Experience Quality in Eco-Tourism.

Conclusion

In conclusion, Aesthetics is deemed a huge difference between both groups, where it is more concerned with males as compared to female eco-tourists. Contrarily, CROI has more influence on total experience quality among female tourists as compared to the male eco-tourist. However, education was the main factor that significantly influenced positively to total experience quality for both groups females and males but it showed higher among female eco-tourists. Surprisingly Service Excellent, Social and Escapism did not influence their total experience quality for both genders. Finally, it could be seen through the result, that when the tourists had a positive total experience quality, they tended to be more advocates than attachments for both groups. These findings will be beneficial to the tourism industry and service providers in strategizing and improving their services.

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Macroeconomics Factors Affecting Net Exports of Oil Palm Industry in Malaysia

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Abstract: This quantitative study investigates the impact of oil palm production, oil palm pricing, inflation, and GDP growth rate on the net exports of Malaysia's oil palm industry. This research is aimed at analyzing how the net export of oil palm relates to certain macroeconomic variables. This study has employed multiple regression analysis through Ordinary Least Squares for 26 years of time series data from 1996 to 2020 in Malaysia. The findings from this study improve our understanding of the major factors contributing to net exports in the oil palm industry. Palm oil production, price, as well as GDP growth, drive net export of palm oil in Malaysia found during this research. An increase in production leads to the reduced amount of palm oil exported, all other things remaining constant. Conversely, inflation and GDP growth are major drivers behind the increased net export of palm oil.

Keywords: *Oil palm industry, net exports, macroeconomic factors, prices, production, inflation, economic growth.*

1. Introduction and Background

Malaysia's oil palm industry has shown remarkable progress. Initially grown as an ornamental plant in Malaysia, it has now transformed into a major industry. It has the highest growth rate for global demand for foodstuff, cosmetics, animal feed, bioenergy and other sectors (Abazue et al., 2015). The expansion of Malaysia's palm oil sector has created a global demand for exports among trade partners. As a result, Malaysia has established itself as the world's leading producer and exporter of palm oil around the globe. Crude palm oil production in 1990 was 6.09 million tonnes and increased to 10.84 million tonnes and 16.99 million tonnes in 2000 and 2010, respectively (Nambiappan et al., 2018). Palm oil cultivation in Malaysia is vast at more than 5.67 million hectares or 17% of the country's total land area with the export of palm oil products at 15.71 million tonnes or an equivalent value of RM86,472 million or roughly USD 18,662 million (Rajakal et al., 2024). The industry employs over 2 million people and contributes significantly to Malaysia's foreign exchange revenues (Nambiappan et al., 2018) Malaysian palm oil business contributes significantly to the country's economy by providing both money and job possibilities through exports. It was the fourth-largest contributor to Malaysia's economy in 2011, adding RM 53 billion (USD 16.8 billion) to the country's Gross National Income (Khamarudin et al., 2021 This business contributes 5% to 7% of Malaysia's GDP on average, with export earnings averaging RM 64.24 billion per year over the last five years (MPOB, 2023). As of 2021, the contribution of this industry to Malaysia's GDP was anticipated to be 2.5 percent (Ludin et al., 2022).

Malaysia is also currently leading the world in the production of biodiesel which uses palm oil as its primary input (Ziaei & Ali, 2021). The government is supporting the industry for its biodiesel contribution through the Biofuel Policy 2006, the Biofuel Industry Act 2007 and a supporting policy in 2011 (Ziaei & Ali, 2021). There are 22 biodiesel plants currently operating in Malaysia with a capacity of more than 2 million tonnes per year Mahayuddin et al., 2022). With the demand for sustainable energy rising amid climate change global issues, Malaysia's export of palm oil is gaining more significance. Malaysia's palm oil export markets have expanded to more than 200 markets throughout the world (Nambiappan et al., 2018). However, the sector is facing several challenges, including increased production costs, declining yields, and fierce competition from alternative vegetable oils. These problems are worsened by different macroeconomic factors including output, price, inflation rates as well as GDP growth rates. Although Malaysia has recently experienced an increase in oil palm production volumes, it is projected that the expansion will slow own because of problems like land constraints, labor shortages and environmental considerations. The fluctuations seen in palm oil prices over the short term though have mostly been upward trending driven by global demand and supply shifts along with

differing climatic conditions affecting agriculture. Sustainability concerns have gained increasing importance on the political agendas of governments, bought up by consumers' raise for sustainable goods and services and also become a major concern for businesses globally (Kumar et al., 2005).

Some of the major environmental issues connected with the production of palm oil are the emissions of greenhouse gases, wastewater production, poor waste disposal methods, and inefficiency in energy use (Zamri et al., 2022). This sector has labor-related problems like poor working conditions, low pay, labor shortages and lack of adequate training and skills development (Deli et al., 2023). Another key challenge to the domestic palm oil sector is its price volatility which affects not only pricing but also profitability (Ahmad et al., 2020). These elements of the macro economy are affecting the oil palm industry in Malaysia leading to rising production costs, reduced efficiency, and declining price trends. In this way, it becomes difficult for local producers of palm oil to compete amidst the unpredictable future of this industrial sector. Therefore, there is a need for regulators and industry players to come up with strategies that will address these issues so that the sector can remain viable in the long run. The purpose of this study is to investigate how four independent factors-oil palm production, oil palm price, inflation rate, and GDP growth rate affect the net export of palm oil in Malaysia. Thus, this research will provide knowledge about the factors influencing the overall performance of the Malaysian oil palm industry and recommendations to help the business thrive.

2. Literature Review

Palm oil is an important commodity for export in Malaysia. A positive net export brings in trade surplus revenue for the country, contributing to higher GDP and stronger currency value for Malaysia. The study of how a net export can be improved is pertinent especially so for a country relying on a commodity such as oil palm for one of its important revenue generators. Palm oil net export has not been widely analyzed for its determinants. Tandra et al. (2022) however have analyzed the determinants of competitiveness of the global oil palm trade and found population and import of animal or vegetable oils to be positively affecting palm oil trade competitiveness, while GDP per capita and RSPO negatives affect it. Seng & Ahmad (2017) found Malaysian palm oil exports to be affected by world GDP. Jazuli & Kamu (2019) analyzed Malaysian palm oil export demand and found palm oil production, price of substitutes and palm oil-based products to be significantly affecting the export demand for palm oil. There is a lot more literature that discusses the determinants of palm oil exports.

Economic growth: Palm oil exports have been studied for impacts by macroeconomic variables including economic growth which is often represented by changes in GDP. In a study by Ridwannulloh & Sunaryati (2018), Indonesian crude palm oil export is examined and the study found the country's GDP and GDP of trading partners to be positively affecting Indonesia's crude palm oil export while the country's exchange rate and domestic consumption is found to be negatively affecting Indonesia's crude palm oil export. GDP has indeed been studied to determine its impact on production and export revenue. A higher GDP translates to more economic and business activities, thus triggering higher consumer expenditure. In the oil palm industry, GDP may shine as a stimulating factor for the demand for palm oil and its derivatives like cooking oil, biodiesel, and oleochemicals. Several studies show that there is an increase in the usage of palm oil products (biodiesel, food, cosmetics) with an increase in GDP development.

Empirical evidence indicates that economic expansion positively influences Malaysian domestic production of palm oils. Ahmad et al. (2019) found that the increase in GDP is one of the main drivers of the increased palm oil production level in Malaysia this enabling them to meet going years needs either within or beyond its borders. Also, it is important to know that the palm oil industry can benefit from higher GDP growth rates through increased export competitiveness. In international markets, a developing economy with a higher GDP frequently leads to increased demand for numerous items, including palm oil products. As one of the leading producers of palm oil globally, Malaysia will have increased production and export levels when there is strong GDP growth. For this reason, strong GDP growth can also create a conducive investment environment as well as support innovation within the palm oil sector. This will translate into higher investments meaning greater production efficiencies and yields alongside improved quality of palm oil products thereby making Malaysian ones more competitive internationally. Hence, the GDP growth rate could influence levels of investment in the palm oil industry. Empirical research has shown that more investments in the industry, including plantation expansion, infrastructure development and technology adoption happen when the country posts high GDP

growth rates (Kannan et al., 2018). Economic growth is strong which causes a good investment atmosphere and also makes money come into the business. The performance of the palm oil industry in the world market is affected by the GDP growth rate. As per various empirical studies, high GDP growth rates in Malaysia and other nations can stimulate many industries to use palm oil as an input including food processing and biodiesel production (Goh et al., 2021). A better export performance will enhance the expansion and competitiveness of the palm oil industry.

Inflation rate: One of the macroeconomic variables that are included in the study on determinants for exports is inflation. Inflation is positively affecting the exports of 5 ASEAN countries (Ilmas et al., 2022) and is negatively affecting palm oil export volume by Indonesia to its ten major destination countries (Widad, 2022). Inflation in a country will tend to make exports less desirable and thus may cause exports to fall. The impact of inflation on net exports is uncertain as it depends on both exports and imports. The impact of rising general prices may be easier to explain by looking at its impact on oil palm production instead. A rise in inflation rates may increase operating expenditures such as labor, fertilizer and fuel for palm oil producers, causing a smaller profit margin and reduced competitiveness (Isa et al., 2020).

Palm Oil Production: Palm oil production in Malaysia is marked by so many factors that affect the industry such as weather, land use policies, labor force and capital availability as well as technological advancements. The industry can only keep on being profitable and viable in the future if some policies and projects enhance sustainable practices, increase productivity levels and protect the environment. Regarding palm oil production in Malaysia, one of the most crucial factors is land accessibility. The establishment of palm oil plantations requires arable land. Land-use regulations such as land tenure systems and conversions have been shown to play a role in regulating the development of the palm oil sector (Azman-Saini et al., 2019). This can be seen as an array of factors that affect the rate of palm oil being expanded and produced, such as inadequate lands and environmental legislation. Hence, technological advancement serves a key purpose in improving the productivity and efficiency of the industry during these times. Research indicates that mechanization, genetic modifications and precision farming methods positively influence palm oil production (Parveez et al., 2022).

Nevertheless, it can be deduced that with the extravagant uptake of new technologies, yields will increase, harvesting techniques improved and resource management enhanced leading to an upsurge in production volumes overall. A trained labor force is very crucial for the smooth and effective working of the palm oil sector. Possibly this is why some scholars state that continued palm oil production requires readily available labor and constant skills upgrading (Rahman et al., 2016). For instance, migration patterns among workers or wage changes may influence labor markets affecting how much there exists for hiring hence influencing its price thus we may conclude that even if there are high costs; still people can produce again. A few key variables that influence palm oil production in Malaysia are weather patterns, availability of land, labor as well as capital. Since the productivity of oil palms depends greatly on appropriate rainfall and temperature, any change in these two factors will affect their performance significantly. Another big factor affecting Malaysian palm oil production is land. Because of the proliferation of oil palm trees, there are now problems like deforestation and the alienation of land use that might have adverse effects on the ecosystem. There is also a need for labor and money to produce palm oil.

High production costs may arise due to limited manpower leading to obstacles in expansion or improvement projects as a result of insufficient finances. The Government of Malaysia has implemented various policies and initiatives to address production issues, such as NKEA for Palm Oil, to enhance efficiency and promote green business practices. In addition, the authorities have fostered research and advancements in technology as well as productive manufacturing methods. According to empirical research carried out on palm oil in Malaysia, land availability is an important factor for Malaysian palm oil production. On the other hand, it was found from the study that larger land areas should be required for palm oil plantations (Hassan et al., 2018). As a result, increased productivity levels are dependent upon the availability of cultivable land. Moreover, a skilled workforce is essential for sustaining and improving productivity in the oil palm sector. Indeed, labor availability and skills play a crucial role in palm oil production in Malaysia as empirically shown by Isa et al., (2020). This is because access to skilled labor ensures efficiency as well as the introduction of new production methods within plantations.

Price of Palm Oil: The production and potentially the net exports of a product may be affected by its price. Concerning palm oil, an increase in its price can encourage further investment in the industry. This may lead to improved productivity, output and consequently profitability. Therefore, palm oil prices are influenced by worldwide supply and demand, weather conditions, costs of inputs as well as government policies (Sabariah & Rusmawati, 2014). According to Chong et al. (2017), a country's export earnings have a positive relationship with the global oil palm price. It plays a role in the growth of the palm oil industry and the economy as a whole. In addition to that, Sabariah & Rusmawati (2014) state that many factors affect palm oil prices such as global supply and demand weather changes production costs, etc. Rahman et al (2019) posited that the world price of palm oil has positive effects on Malaysia". When prices of inputs change, it may alter the cost structure in palm oil-producing areas like Malaysia hence affecting profitability level (Parveez et al., 2022).

3. Research Methodology

This study is a quantitative analysis that uses a deductive approach to data analysis. The data used for the study are time-series data for the period of 26 years from years 1996 to 2020. Some advantages of using quantitative research methods include the ability to generalize findings to a larger population, demonstrate cause-and-effect relationships, and replicate studies to establish reliability. However, there are some limitations to this method including the potential for researcher bias and the possibility of overlooking important nuances and contextual information. The study involves a multiple regression analysis using the Ordinary Least Square regression to examine the nature of the relationship between the net export of oil palm as the dependent variable and production of oil palm, prices of oil palm, inflation, and GDP growth rate as independent variables. Data for the study is obtained from various secondary data sources. Table 1 shows the variables used for the study and data sources.

Table 1: Variables and Data Source

VARIABLE	PROXY	DATA SOURCE
Net Export	EXP	Statista Trading Economics
Production of Oil Palm	PROD	Observatory of Economic Complexity (OEC) Economics & Industry, Dept of Statistics Malaysia (DOSM) Development Division, Malaysian Palm Oil Board (MPOB)
Price of Oil Palm	PRICE	Index Mundi
Inflation Rate	INF	Bank Negara Malaysia (BNM)
GDP Growth Rate	GDP	Bank Negara Malaysia (BNM)

The study is based on the following relationship among the variables:

$$NET_EXP = f(PROD, PRICE, INF, GDP) \quad [1]$$

Where:

NET_EXP = Net Export of Oil Palm in Malaysia.
PROD = Production of Oil Palm.
PRICE = Price of Oil Palm.
INF = Inflation Rate.
GDP = GDP Growth Rate

In equation 1, the Net Export of Oil Palm in Malaysia (NET_EXP) is examined to be influenced by the production of oil palm (PROD), price of oil palm (PRICE), inflation rate (INF) and GDP growth rate (GDP). Increases in PROD, PRICE and GDP are expected to increase NET-EXP while an increase in INF is expected to reduce EXP. For the regression model (equation 2), PROD, PRICE and GDP coefficients are expected to be positive while the INF coefficient is expected to be negative in the estimated regression.

$$NET_EXP = \alpha + \beta_1 PROD + \beta_2 PRICE + \beta_3 INF + \beta_4 GDP + \mu \quad [2]$$

Where:

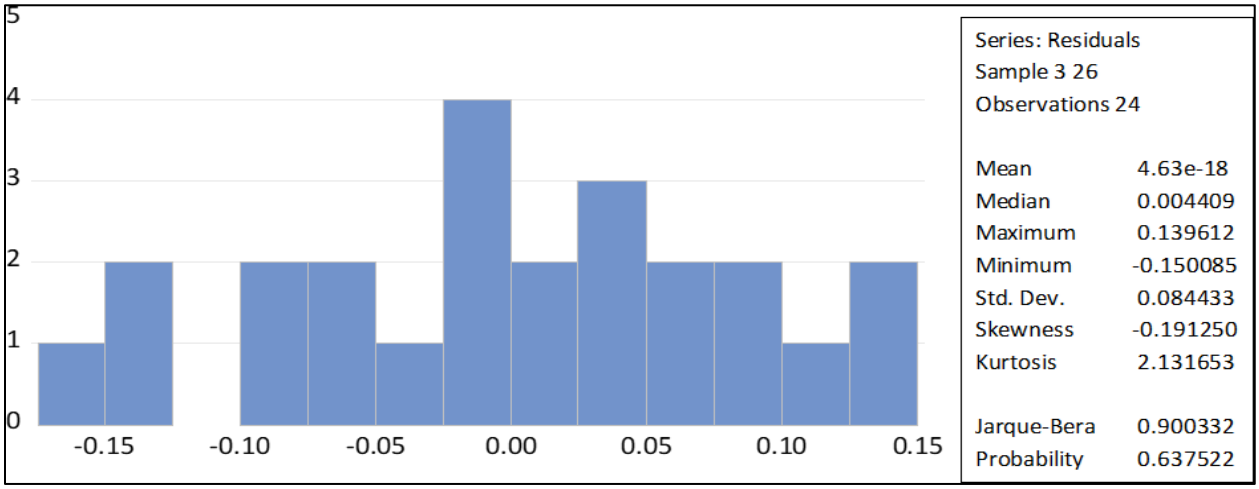
α = Constant
$\beta_1,\beta_2,\beta_3,\beta_4$ = Estimated coefficients
μ = Random error term

The study applies several diagnostic tests -- Normal Distribution (Jarque-Bera) Test, Serial Correlation (Durbin-Watson) Test and Multicollinearity Test (Variance Inflation Factor). The Jarque-Bera Test is used to determine if the sample used is taken from a normal population. When the data has a normal population, its distribution will form a bell-shaped curve when it is plotted on graphs, histograms, box plots, or frequency polygons. The shape of the curve will depend on the mean and standard deviation of the population. (Mohd Yusoff et al., 2022). To test if study data is normally distributed, the Jarque-Bera Test is tested for skewness and kurtosis of residuals.

4. Results

Using histogram, the Normal Distribution Test shows that the residual of the regression has almost a symmetrical bell-curved shape. Thus, we can conclude that the data is normally distributed (Figure 1).

Figure 1: Histogram



In this study, the variables apply log with difference form for all variables for the regression (Equation 3). The log net export of the oil palm industry (DLNET_EXP) is the dependent variable whereas log production of oil palm (DLPROD), log price of oil palm (DLPRICE), log inflation rate (DLINF), and log GDP growth rate (DLGDP) are the independent variables. DLNET_EXP only has a negative relationship with DLPROD whereas DLNET_EXP has positive relationships with the remaining independent variables, DLPRICE, DLINF, and DLGDP.

$$DLNET_EXP = \alpha + \beta_1 PROD + \beta_2 PRICE + \beta_3 INF + \beta_4 GDP + \mu \quad [3]$$

Where:

DLNET_EXP	= Difference log net export of oil palm in Malaysia.
DLPROD	= Difference log production of oil palm.
DLPRICE	= Difference log price of oil palm.
DLINF	= Difference log inflation rate.
DLGDP	= Difference log GDP growth rate
α	= Constant
$\beta_1,\beta_2,\beta_3,\beta_4$	= Estimated coefficients
μ	= Random error term

Table 2 shows descriptive statistics of variables. There are 24 observations after data is transformed into a second difference form. In the descriptive analysis, skewness is a measure of symmetry. Skewness values are mostly close to zero, and the median and mean values are almost equal indicating that data used in general are normally distributed.

Table 2: Descriptive Statistics

	DLNET_EXP	DLPROD	DLPRICE	DLINF	DLGDP
Mean	0.012866	0.003055	0.009890	0.070412	0.064813
Median	0.055104	-0.010490	0.090381	0.133559	-0.026871
Maximum	0.562850	0.193854	0.433433	2.560014	5.426535
Minimum	-0.723604	-0.156512	-0.999249	-1.622478	-2.594598
Std. Dev.	0.293250	0.100736	0.329634	0.855053	1.597597
Skewness	-0.439957	0.270665	-1.161422	0.688542	1.518587
Kurtosis	3.173715	2.132136	4.696547	4.569090	6.949405
Jarque-Bera	0.804426	1.046226	8.273878	4.358404	24.82222
Probability	0.668838	0.592673	0.015972	0.113132	0.000004
Sum	0.308784	0.073326	0.237365	1.689888	1.555501
Sum Sq. Dev.	1.977893	0.233396	2.499155	16.81564	58.70331
Observations	24	24	24	24	24

A test of autocorrelation, also known as serial correlation, is performed to assess the degree of connection between a variable and its previous values over several observations or time intervals. The Durbin-Watson test can be used to evaluate any serial correlation between variables in a regression equation with the test consistently assigned a value between 0 and 4. When the range is 0 to less than 2, positive autocorrelation is indicated while range between 2 and 4 indicates negative autocorrelation. In Table 3, the Durbin-Watson statistics is 2.1783, indicating the Durbin-Watson test to be statistically significant at a 5% level with no first-order serial correlation.

Table 3: Test of Autocorrelation

Dependent Variable: DLNET_EXP
Method: Least Squares
Date: 06/06/23 Time: 23:41
Sample (adjusted): 3 26
Included observations: 24 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLPROD	-0.655981	0.205404	-3.193607	0.0048
DLPRICE	0.964436	0.087077	11.07573	0.0000
DLINF	0.016127	0.029026	0.555607	0.5850
DLGDP	0.097923	0.015426	6.348077	0.0000
C	-0.002150	0.019046	-0.112906	0.9113

R-squared	0.917100	Mean dependent var	0.012866
Adjusted R-squared	0.899648	S.D. dependent var	0.293250
S.E. of regression	0.092897	Akaike info criterion	-1.731602
Sum squared resid	0.163967	Schwarz criterion	-1.486174
Log likelihood	25.77922	Hannan-Quinn criter.	-1.666490
F-statistic	52.54814	Durbin-Watson stat	2.178441
Prob(F-statistic)	0.000000		

Multicollinearity occurs when a perfect linear function of one or more additional independent variables exists although there is no independent variable. Although multicollinearity is rare, it can be detrimental as it becomes more challenging to precisely estimate the true model's coefficients the more highly correlated two (or more) independent variables are (Studenmund, 2011). The variance inflation factor (VIF) is a tool that determines the severity degree of multicollinearity. If the VIF of a variable is bigger than 5, the multicollinearity is considered to be severe. Based on the figure above, the VIF for variables production of oil palm (DLPROD), price of oil palm (DLPRICE), inflation rate (DLINF), and GDP growth rate (DLGDP) are all do not exceed 5 hence the variables have little correlation with one another, and the degree of multicollinearity is not severe.

Table 4: Multicollinearity Test

Variance Inflation Factors
Date: 06/06/23 Time: 23:45
Sample: 1 26
Included observations: 24

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
DLPROD	0.042191	1.142160	1.141065
DLPRICE	0.007582	2.197867	2.195804
DLINF	0.000842	1.653260	1.641644
DLGDP	0.000238	1.621408	1.618628
C	0.000363	1.008876	NA

An integration analysis via the Augmented Dickey-Fuller Test or Unit Root Test is performed for this study. The Augmented Dickey-Fuller Test or unit root test, is set for 2nd difference, trend, and intercept to obtain significance and ensure that our data is normally distributed. All of the independent variables in this study show that there is no multicollinearity with a low degree of multicollinearity since the VIF for all the independent variables does not exceed 5. After running the Augmented Dickey-Fuller test at the 2nd level of difference, all the independent variables appear to be significant. This suggests that the independent factors have a long-term impact on Malaysia's net export of oil palm.

Table 5: Unit Root Test

Null Hypothesis: D(LPRICE,2) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=5)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.542389	0.0000
Test critical values:	1% level	-3.769597	
	5% level	-3.004861	
	10% level	-2.642242	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LPRICE,3)
Method: Least Squares
Date: 05/19/23 Time: 22:28
Sample (adjusted): 5 26
Included observations: 22 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LPRICE(-1),2)	-1.544084	0.236012	-6.542389	0.0000
D(LPRICE(-1),3)	0.396166	0.148456	2.668583	0.0152
C	0.033040	0.047758	0.691814	0.4974

R-squared	0.754334	Mean dependent var	0.051798
Adjusted R-squared	0.728474	S.D. dependent var	0.429252
S.E. of regression	0.223675	Akaike info criterion	-0.031121
Sum squared resid	0.950580	Schwarz criterion	0.117658
Log likelihood	3.342327	Hannan-Quinn criter.	0.003927
F-statistic	29.17033	Durbin-Watson stat	2.332576
Prob(F-statistic)	0.000002		

Null Hypothesis: D(LPROD,2) has a unit root
Exogenous: Constant
Lag Length: 4 (Automatic - based on SIC, maxlag=5)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.960670	0.0001
Test critical values:	1% level	-3.831511	
	5% level	-3.029970	
	10% level	-2.655194	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations and may not be accurate for a sample size of 19

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LPROD,3)
Method: Least Squares
Date: 05/19/23 Time: 22:27
Sample (adjusted): 8 26
Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LPROD(-1),2)	-7.800122	1.308598	-5.960670	0.0000
D(LPROD(-1),3)	5.360100	1.142748	4.690534	0.0004
D(LPROD(-2),3)	3.678751	0.857713	4.289025	0.0009
D(LPROD(-3),3)	1.941855	0.536656	3.618439	0.0031
D(LPROD(-4),3)	0.537477	0.215117	2.498534	0.0267
C	-0.033315	0.012279	-2.713069	0.0177

R-squared	0.935000	Mean dependent var	-0.001065
Adjusted R-squared	0.909999	S.D. dependent var	0.164066
S.E. of regression	0.049220	Akaike info criterion	-2.932943
Sum squared resid	0.031494	Schwarz criterion	-2.634699
Log likelihood	33.86296	Hannan-Quinn criter.	-2.882469
F-statistic	37.39971	Durbin-Watson stat	2.365664
Prob(F-statistic)	0.000000		

Null Hypothesis: D(LINF,2) has a unit root
Exogenous: Constant
Lag Length: 2 (Automatic - based on SIC, maxlag=5)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.247279	0.0004
Test critical values:	1% level	-3.788030	
	5% level	-3.012363	
	10% level	-2.646119	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LINF,3)
Method: Least Squares
Date: 05/19/23 Time: 22:30
Sample (adjusted): 6 26
Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LINF(-1),2)	-4.614491	0.879406	-5.247279	0.0001
D(LINF(-1),3)	1.956594	0.642892	3.043424	0.0073
D(LINF(-2),3)	0.680904	0.292965	2.324183	0.0328
C	-0.009979	0.120418	-0.082872	0.9349

R-squared	0.879973	Mean dependent var	0.115585
Adjusted R-squared	0.858792	S.D. dependent var	1.441893
S.E. of regression	0.541831	Akaike info criterion	1.781916
Sum squared resid	4.990865	Schwarz criterion	1.980873
Log likelihood	-14.71012	Hannan-Quinn criter.	1.825095
F-statistic	41.54487	Durbin-Watson stat	1.903153
Prob(F-statistic)	0.000000		

A multiple regression is performed on data using a second difference log form for all variables resulting in regression estimates as shown in Table 6. The goodness of fit measure, R^2 exhibits a value of 0.9171, showing that 91.71 percent of variations in net export for oil palm in the second difference log (DLNET_EXP) is explained by the production of oil palm, price, inflation and GDP, all of which are in second difference log form (DLPROD, DLPRICE, DLINF, DLGDP).

AN F-test analysis is also conducted to detect the overall fit of the regression equation between the dependent variable, DLNET_EXP and the independent variables, DLPROD, DLPRICE, DLINF, and DLGDP at a 5% level of significance. The value of F-statistics which is 52.5418 is higher than the critical value of F-statistics, 2.84 and the probability value of F-statistics at less than 5% shows that the regression equation is statistically significant at 5% and has a good overall fit.

Table 6: Regression analysis

Variables	Coefficients	Probability
Constant	-0.0022	0.9113
DLPROD*	-0.6560	0.0048
DLPRICE*	0.9644	0.0000
DLINF	0.0161	0.5850
DLGDP*	0.0979	0.0000
F-statistics	52.5481	0.0000
R^2	0.9171	
Adjusted R^2	0.8996	
Durbin-Watson Statistic	2.1784	

*Significant at a 5% level of significance

The regression output can be explained as a regression equation as shown in equation 4:

$$DLNET_{EXP} = -0.0022 - 0.6560DLPROD + 0.9644DLPRICE + 0.0161DLINF + 0.0969DLGDP \quad [4]$$

Discussion

Based on the regression equation, an increase in production of oil palm (in difference log) by 1000 metric tons results in a drop in n the difference log net export of oil palm industry by RM0.6560 billion. This shows that DLNET_EXP and DLPROD have a negative relationship. An increase in the price of oil palm (in difference log) by RM1 per metric ton, results in the net export of the oil palm industry (in difference log) increase by RM0.9644 billion. This shows that DLNET_EXP and DLPRICE have a positive relationship. An increase in the inflation rate (in the differences log) by 1%, results in the net export of oil palm (in the difference log) increasing by RM0.0161 billion. This shows that DLNET_EXP and DLINF have a positive relationship. An increase in GDP growth rate (in difference log) by 1% results in net export of oil palm (in difference log) increase by RM0.0979 billion. This shows that DLNET_EXP and DLGDP have a positive relationship. In general, the regression has a good fit. From all independent variables, DLPROD, DLPRICE and DLGDP are significant variables in explaining DLNET_EXP at a 5% significance level. In terms of signs of relationship, DLPRICE and DLGDP show an expected positive relationship with DLNET_EXP.

5. Managerial Implications and Recommendations

In this study, researchers found that an increase in the oil palm price leads to a rise in Malaysia's net export of oil palm. This relationship is seen in the literature. The supply elasticities help explain why higher palm oil prices increase Malaysia's net exports of palm oil. Malaysia is known as one of the biggest producers and has so much infrastructure and the ability to meet demand whenever prices go up. Producers in Malaysia tend to produce more when prices rise, thus having a surplus for exportation. Thus, exports from Malaysia can increase as a result of this ability to adapt quickly and boost supply within a short time such that when prices are high, they command a big share of the world's palm oil market. Another reason is the global demand dynamics of palm oil. Even if the price of palm oil goes higher, importing countries may still need large quantities because there are no substitutes that are readily available or cheap. This kind of product serves various purposes in different sectors like food, cosmetics and biofuels. With an increase in prices, Malaysia has become a more appealing destination for importing countries due to its established supply chains and image as a trustworthy exporter. Therefore, Malaysian exports have also risen to sustain this level of demand despite the price increase maintaining or even increasing its market share hence resulting in higher net exports.

The findings of this research show that there is a relationship between the economic growth of Malaysia and the net export of palm oil. Thus, an increase in GDP growth rate leads to generally better economic conditions, resulting in more investments into main sectors such as oil palm production. Higher GDP growth provides conditions for both the government and private sector to invest more resources in the modernization of palm plantations, refinement of process units and improvement of transport networks. This enhances productivity and reduces costs of producing palm oil among other benefits, thereby making Malaysia one of the world's most competitive producers. As a result, due to increased international demand, it has enhanced its palm oil shipments around the globe resulting in greater foreign earnings from these agricultural exports. In addition,

Malaysia's development of strong commercial relations and worldwide marketplace assist the country in achieving economic growth.

Malaysia's oil palm business is an important economic engine, contributing considerably to the country's GDP and employing millions of people. With Malaysia being the world's second-largest producer of palm oil, the business is also a significant source of export earnings. A positive net export of oil palm brings prosperity to the country, thus the factors affecting it must be examined. Furthermore, the macroeconomic aspects that impact the oil palm business are pertinent to secure the industry's long-term survival. Production of oil palm is found to be significant and negatively related to the net export of oil palm. Higher production is not followed by higher net export in the empirical study even though the literature expects the relationship to be positive. This scenario may be due to international business and political disputes that relate to Malaysia's palm oil production and export.

Malaysian government can provide subsidies or tax benefits to such Roundtable of Sustainable Palm Oil (RSPO) certification-compliant palm oil growers, to stimulate sustainable agriculture practices among them to improve their net export for palm oil. Thus through promotion and support of sustainability initiatives, the palm oil industry players can improve their brand image as an environmentally friendly producer of palm oil which could attract green-minded consumers and consequently command higher prices on the overseas market. This would not only increase demand for Malaysian palm oil but also differentiate its product from less sustainably produced competitors thereby increasing net export. Additionally, the government may as well think of bargaining advantageous arrangements with key importers to make Malaysian palm oil cheap through lower duties and other barriers to international trade. It may also create or expand export promotion programs that are directed towards buoyant markets with growing demand for palm oil such as Africa or the Middle East. This will help to improve access to inward markets while at the same time advocating for Malaysian palm oils abroad leading to an increase in levels of exports thus raising net palm oil exports from Malaysia.

An increase in Gross Domestic Product (GDP) is normally linked with a stable and booming economy, hence enhancing Malaysia's reliability as well as making it more appealing for international trade. With the rates of increased economic growth, Malaysia can have favorable trade agreements, abolish export constraints and expand its reach to new markets. Consequently, by having more palm oil exports along with increased production capacity due to expanded market access, Malaysia can have greater net exports of this commodity. The roles played by the Malaysian Government and society in supporting – and aiding the palm oil industry in Malaysia are crucial. Farming will thus increase their output but reduce input costs due to direct subsidies, low-interest loans or tax breaks offered to farmers by the government. To boost productivity while reducing the chances of crop failure, the government could also fund R&D to develop new varieties of palm oil trees that are resistant to diseases and pests. The scheme promotes sustainable approaches within the oil palm sector through the Malaysian Sustainable Palm Oil certification program. Production of environment-friendly oil palm is what is defined under MSPO whereas any company conforming to those specifications will receive an MSPO certificate. In this way, through advertisements, it can protect nature whilst at the same time promoting lasting practices within the sector.

The palm oil business is heavily scrutinized in the international arena as this industry has issues related to deforestation and the sustainability of forest and palm oil plantation practices. For Malaysia to ensure higher exports of its palm oil, the government and local industry players should play their part in promoting the country's production of palm oil in the international market. Campaigning to raise awareness of Malaysia's sustainable practices for palm oil production and the health benefits of palm oil in food consumption should be a priority for government agencies that assist in marketing Malaysia's oil as well as for other relevant stakeholders. Efforts to increase awareness include education initiatives and continuous encouragement towards implementing and improving sustainable production practices in the business. The government might also reinforce sustainable production standards, like the Malaysian Sustainable Palm Oil (MSPO) certification program. These criteria would assist in guaranteeing that the oil palm business operates responsibly and with little environmental damage.

The oil palm industry in Malaysia may also receive help from the community. They can utilize items made from palm oil for cooking, soaps and body lotion to raise awareness and demand. Besides, the community should

always consider supporting companies that are into sustainability to help with sustainable practices within the palm oil belt. A letter to a local member of parliament or joining a protest against unsustainable practices is another way the community can support this industry. This helps raise awareness on why oil palm sustainability must stop its depletion. To support farmers in Malaysia with inputs like fertilizers or pesticides, we can provide them with subsidies. We can also fund research and development through the Malaysian Palm Oil Board, encourage sustainable practices with the Malaysian Sustainable Palm Oil certification scheme and participate in lobbying activities by writing letters to lawmakers. Moreover, Malaysian palm oil suppliers can also perform their functions. The palm oil industry may focus on embracing sustainable practices, investing in research and development (R&D) and enhancing its branding efforts as avenues for boosting the competitiveness of Malaysia's palm oil exports. In this way, Malaysian palm oil becomes attractive to environmentally conscious consumers and markets through methods of production that are eco-friendly together with sustainability certifications. Investment in research and development may improve yields, higher quality products and creation of additional value through novel applications of palm oil. Moreover, strategic marketing and branding initiatives that are centered on quality and sustainability could further enhance Malaysian palm oil's position in the global market making it a more appealing choice for all international buyers.

Conclusion

This study on the net export of palm oil for Malaysia has identified price of the palm oil and GDP growth rate to be positively affecting the net export of palm oil while the production of palm oil is negatively affecting palm oil net export. With the net export of oil palm as one of the biggest contributors to Malaysia's GDP for the past decade, efforts to increase it via understanding the impacts of these macroeconomic variables would improve the competitiveness of this industry in the global market.

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Navigating Urban Mobility: The Relationship between Car Consumption and Public Transport Usage in Malaysia

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Abstract: Increasing private-owned cars in Malaysia has, thus far, contributed to growing congestion, environmental pollution, and decreasing public transport utilization. Car ownership has become possible through economic growth, and convenience and status attached to cars triggered tendencies from shifting to public transit. This development contradicts investments in public transport and aggravates environmental problems. This paper examines the relationship between private car ownership and public transport usage in Malaysia from 2000 to 2022, concentrating on intercity bus services, KTM commuters, and light rail transit. The results indicate that with increased riders for intercity buses and KTM commuter services, car usage drops, while that of light rail may raise car ownership. The study emphasizes the need to upgrade intercity and KTM services to mitigate the pressures of car ownership and calls for further research into the role of light rail.
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Keywords: *Car Consumption, Public Transport Usage, Intercity Bus, KTM Commuter, Light Rail Transit (LRT).*

1. Introduction and Background

The rapid rise in private vehicle ownership has had far-reaching implications for the usage of public transport and overall urban mobility in Malaysia. With economic growth, rising income levels have made car ownership more achievable for many people, resulting in a substantial increase in the number of private vehicles on the road. This has resulted in a lot of urban problems such as traffic congestion, environmental degradation, and a steep decline in the use of public transport. Several factors, especially convenience, perceived status, and comfort associated with private car ownership, make them prefer private transport over public transport. It has been researched that when more and more Malaysians choose to travel by private vehicle, the demand for public transport diminishes, worsening traffic congestion and further burdening urban infrastructure. (Md. Aftabuzzaman, 2023). Also, the shift to private cars undercuts the investment in public transport systems. When passengers go down, revenues drop too, making it hard for public transit operators to maintain and upgrade services. This decline in the use of public transport underutilizes services like buses and trains, resulting in financial losses and efficiency losses in operations. Besides, this preference for private cars exacerbates environmental problems, as private vehicles generally emit more per capita than mass transit options. This is more worrisome in urban areas, as the increased vehicular emission is a major source of air pollution problems, thus affecting public health. One of the modes used to try and reduce this trend is making public transport more appealing to people by improving the frequency, reliability, and affordability of service.

Subsidized fares, enhanced connectivity through quality services, integrated transport systems, and other policy measures have thus become the essential ingredients for making this alternative of public transport viable, more effective, efficient, as well as attractive to car owners (Berggren, 2015). In Malaysia, the rising trend in private car ownership poses very serious problems for the country's public transportation system. The more people use private transport, the less public transport there is, aggravated by a host of problems that include traffic congestion, environmental pollution, and even the underutilization of infrastructure for public transportation. Tackling such issues would require a much deeper understanding of how car consumption impacts public transport use and eventually come up with strategies that would induce a shift away from private vehicles to more environmentally friendly transport modes. This paper is structured into the following key sections to comprehensively discuss the effect of car consumption on public transportation systems in Malaysia, comprising intercity public buses, KTM Commuters, and Light Rail Transit. The following section includes a literature review with the formulation of hypotheses relevant to this study. The methodology section

explains the research design, data collection, and analytical procedures. Section four presents the analysis results, giving insight into the relationship between the use of private cars and public transport. Finally, the paper shall summarize the findings, their implications, and recommendations for policy and further research.

2. Literature Review

This literature review examines the intricate relationship between the growing reliance on private vehicles and the declining use of public transportation systems. This dynamic is particularly pronounced in urban areas such as Malaysia, where increased car ownership poses significant challenges to public transport systems, traffic congestion, environmental sustainability, and overall urban mobility.

Intercity Bus: It is crucial to analyze how the trends in private vehicle ownership relate to public transit means, especially between cities; for example, intercity buses are more affected. It is well-known that the global increase in automobile ownership, particularly within developing countries has significantly led to reduced use of public transport systems such as intercity buses. According to Newman and Kenworthy (1999), increasing wealth and car availability reduce the need for buses. Thus, the need to travel using roads has greatly changed due to automobiles being more flexible than intercity buses, more comfortable, and even easier to use. Cervero (2003) elaborates how traveling by car allows people to make their choice about going anywhere without many restrictions unlike when they are using public transport like intercity bus services. The demand for intercity bus services has significantly dropped due to the growing accessibility and affordability of cars. As documented by Fravel (2012) and Levinson (2013), an increase in car ownership is associated with a decrease in bus ridership, especially in areas where cars are considered more feasible and appealing modes of transportation.

However, some segments of society like lower-income earners, young travelers, and people without any means of transport still depend on intercity buses. Increased car ownership does not negate their presence on intercity buses according to Mouwen and Rietveld (2013). Li and Zang (2022) investigate how changes in car ownership costs and fuel prices influence the demand for intercity buses. The findings indicate that higher car costs lead to increased bus ridership, highlighting the competitive dynamic between these two modes of transport. A travel mode shift from intercity buses to cars will have far-reaching environmental effects, including more greenhouse gas emissions, traffic jams, and higher land requirements for roads and parking spaces. Chen and Green (2024) investigate the influence of economic conditions on travel choices, finding that increased car ownership costs and fuel prices have led to a rise in intercity bus ridership. Their research highlights how economic pressures make buses a more appealing option for cost-sensitive travelers. According to Banister (2008), intercity bus travel should be sustained and enhanced as an environmentally friendly alternative. In a way, increased car ownership has diminished public bus services which raises concerns about social justice because it has left behind only a few modes of transport for those who are either non-drivers or cannot afford their private vehicles. Accessible public transit is key to promoting social inclusion and mobility equity, Pucher & Buehler (2010). To account for the reduction of bus use due to increased car ownership, different policy interventions have been suggested like bus service subsidies, congestion charges, or investments in public transport infrastructure. Litman (2019) talks about how such measures could encourage a switch back to public transport. Given the growing worries about global climate change and urban traffic congestion, it may be time to relaunch intercity bus services. As Levinson et al. (2013) indicate, these buses could find their rightful place in the market if they underwent modernization through cleaner technologies adoption, improved service quality, and better coordination with other forms of transport.

H1: The relationship between Intercity Bus usage and Car Consumption

KTM Commuter: Understanding the relationship between KTM Berhad's (KTMB) train services and car consumption is crucial in the field of transport studies. By investigating this correlation, it will be easy to know how different rail services can affect the private use of smaller automobiles as far as urbanization mobility theme, environmental friendliness or even economic efficiency comes in. In the end, well-established and operational vehicles such as those operated by KTM can reduce the dependency on their cars drastically. The buses may serve as coordinate transportation means for the transformers that commute from faraway places in case, they want to avoid traffic jams. When there are frequent trains which are very reliable and well interlinked with other modes of transport, it significantly discourages driving. Studies have shown that when there are better quality rail systems then people get rid of their cars; for instance, many people do not possess

multiple vehicles if they can access high-quality rail services since it seems like car ownership does not make sense when using trains these days for either long distance or everyday traveling (Wong et al., 2014; Rahman et al., 2021). Long-distance train services can reduce congestion on the roads. This is because if people use trains, they will not have to travel in cars, which means there will be fewer vehicles on the road, thus leading to less traffic and fast traveling. For instance, it has been found that if more people use rail services, this will lead to less congestion and improve urban movement generally. For KTMB (Keretapi Tanah Melayu Berhad), railways are one of the best options for tackling traffic jams on important routes and in city centers (Hussain & Zailani, 2017; Lee & Koo, 2018). There are also numerous other advantages of increased use of trains when it comes to the environment. Compared with private cars, trains emit less per person; that's why they are a more sustainable means of transport. Research indicates that enhancing railway services lowers vehicle emissions and consequently has smaller environmental footprints. Train services can also save money by reducing car usage. Thus, transport authorities can build their rail infrastructure and keep roads in better shape thereby reducing private individuals' spending on repair of their vehicles, fueling them, and paying for their parking spaces (Abdullah, 2019; Lim &Tan, 2023).

The following are suggested ways of maximizing national-wide advantages resulting from railway networks that would affect automobile utilization patterns: Increased frequency and reliability of trains; and integration of the rail network with local bus services. Improving the accessibility of train stations and providing ample parking around strategic railway hubs could facilitate such a shift (Yusof, 2020). Economic factors, including fuel prices, vehicle ownership costs, and the overall economic climate, significantly affect commuter decisions and car consumption. The fluctuations in fuel prices and car ownership costs impact commuting patterns. The rising of fuel prices and higher car maintenance costs have led to a reduction in car usage for commuting, with many individuals opting for public transportation or alternative commuting methods (Chen& Green,2024). Li and Zang (2022) investigate the effects of smart commuting technologies, including real-time traffic management and ride-sharing apps, on car consumption. They find that these technologies can reduce the need for personal vehicle ownership by making alternative commuting options more convenient and efficient.
H2: The relationship between KTM Commuter usage and Car Consumption

Light Rail Transit (LRT): Transportation researchers have been interested in the effects of Light Rail Transit (LRT) systems on car usage. Understanding how light rail transit (LRT) systems influence car usage is important for several reasons. In this regard, contemplating the various impacts of LRT services on the uptake of private cars can enable one to have an insight into urban mobility, environmental issues, as well as economic feasibility. According to Cervero & Duncan (2006), light rail systems possess great potential for creating substantial reductions in vehicle ownership or the increase in both ownership and use of cars. Studies show that effective LRTs eventually reduce car ownership and usage. For example, the largest LRT networks usually correspond to substantial reductions in driving among urban inhabitants who find traveling by bus or train more convenient than using their vehicles (Cervero & Duncan 2006). Moreover, when new LRT lines are formed, a transition from automotive dependence to mass transport dependency is encouraged. The service of LRT (Light Rail Transit) is a choice instead of driving, as it is used in urban areas where LRT connects to all crucial parts such as employment centers and other important destinations (Givoni & Rietveld, 2014). In addition, LRT can decongest roads by providing another means of transport other than cars. To reduce this problem, effective LRT services bring about a lesser number of vehicles thus reducing traffic jams and traveling time.

Scholars have shown that cities having strong LRT systems experience fewer road traffic jams compared to those without such services (Buehler & Pucher, 2012). For instance, the extension of the Portland MAX light rail line not only resulted in a decrease in traffic congestion but also improved movement within the city boundaries. As stated by some recent investigations, current metro systems serve as a practical substitute for individual vehicles hence reducing the use of cars. This leads to a decrease in vehicle miles traveled (VMT) due to LRT and promotes sustainable urban commuting. The presence of these systems in cities has evidenced fewer car trips and less traffic jams (Litman, 2021). The environment is significantly affected by increased LRT use. LRT (Light Rail Transit) produces lower emissions per passenger than private cars hence creating a more sustainable form of transport. Research indicates that by improving LRT services, it is possible to reduce vehicular emissions and the ecological footprint of transportation (Litman 2015). LRT systems are also vital in CO2 emission reduction especially when they are coupled with smart city infrastructure (Li and Zhang, 2022).

Economically speaking, enhanced LRT services could offer substantial savings in costs. People can save money on vehicle maintenance, fuel, and parking among other things. Likewise, a reduction in car usage leads to the construction and maintenance of roads reducing their wear and tear as such governments will spend less on this (Cervero & Kockelman, 1997). Several strategies can be used to maximize the benefits of LRT systems and their impact on car consumption. Increasing the frequency, reliability, and coverage of LRT service is vital. Integration with other public transport services like buses or bike-sharing can facilitate the shift from cars towards public transport modes. Similarly to this (Cervero, 2013), easy access to LRT stations as well as adequate parking places at main centers could further encourage this move.
H3: The relationship between Light Rail Transit (LRT) usage and Car Consumption

3. Research Methodology

The study uses a quantitative research design to explore the relationship between car consumption and public transport usage, focusing specifically on intercity public buses, KTM commuters, and light rail systems. Data analysis is performed using EViews statistical software. The design incorporates regression and correlational analysis to identify and measure the relationships between the dependent variable (car consumption) and the independent variables (intercity bus usage, KTM Commuters usage, and light rail (LRT) usage.

Conceptual framework: The conceptual framework for a study entitled "Navigating Urban Mobility: The Relationship between Car Consumption and Public Transport Usage in Malaysia" has three variables representing various relationships concerning public transport and car consumption. A conceptual structure synthesizes correlated parts and variables that assist in remedying real-life issues. It is the last lens used to see through the deductive resolution of a known problem (Imenda, 2014). The starting point in developing a conceptual framework is a deduction that there exists a problem and this can necessitate some processes, procedures, functional approaches, models, or theories for solving it (Zackoff et al., 2019). Intercity bus usage, KTM (Keretapi Tanah Melayu) commuter usage, and Light Rail usage as independent variables are presented in Figure 1. These are different types of public transportation that are thought to impact the dependent variable, Car Consumption. The framework suggests that increased use of intercity bus usage, KTM usage, and light rail usage can potentially help to lower car consumption levels. The arrows within the framework indicate expected cause-and-effect relationships whereby increasing options for public transport will reduce car consumption.

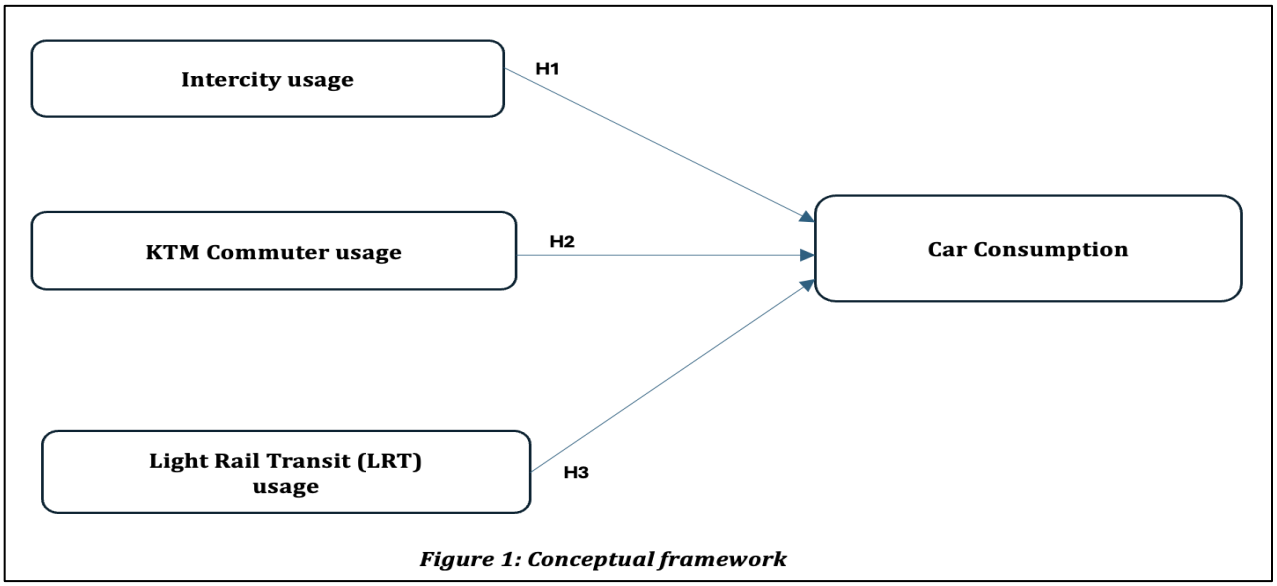


Figure 1: Conceptual framework

Data collection and tabulation: The data for this study is the secondary data obtained from the Ministry of Economy's website. This study observed 23 years of car consumption and the other three public transport (Intercity bus, KTM Commuter, and Light Rail) usage in Malaysia from 2000 until 2022. Table 1 displays the dependent variable and the independent variables. This study uses a regression model to quantify the impact

of car consumption on public transport usage. This analysis can help determine whether increased car ownership correlates with decreased public transport use (Mokhtarian & Cao, 2008). Since the raw data of all variables are not in the same unit, hence all the data need to be put "ln" to make sure all the values are close to each other and easy to calculate then generate the results.

Descriptive analysis: Also known as descriptive analytics or descriptive statistics, is the process of using statistical techniques to describe or summarize a set of data. It also helps to describe, or usefully illustrate data points for patterns to develop that meet all the data's requirements. It is the process of using both recent and old data to find trends and relationships. It is often called the most basic data analysis since it identifies trends and relationships without going any further (Villegas, 2024). Descriptive analysis is usually used to measure the frequency, tendency (mean, median, and mode), dispersion or variation (range, variance, and standard deviation), and to find out the data's normality (skewness, and kurtosis). In this study, a descriptive analysis will be used to analyze the secondary data obtained, calculating its tendency, and dispersion and determine whether the data is normal or not by looking at the results of skewness and kurtosis. There will be some visual representations using a few suitable charts that can help in understanding the data better. Other than that, one of the key components of descriptive analysis, the correlation matrix is being explored in this study. A correlation matrix is particularly used when examining the relationships between multiple variables. It is a table that displays the correlation coefficients between pairs of variables, providing a quantitative measure of the strength and direction of their relationships. Each cell in the correlation matrix represents the correlation coefficient between two variables, which ranges from -1 to 1. A value close to 1 indicates a strong positive correlation, meaning that as one variable increases, the other variable also tends to increase. Conversely, a value close to -1 indicates a strong negative correlation, meaning that as one variable increases, the other tends to decrease. A value around 0 suggests no significant linear relationship between the variables. During the on the role of public transport consumption in increasing public transport, a correlation matrix can help identify the relationships between different public transport options (intercity bus, KTM, and light rail) and car consumption. For example, if the correlation coefficient between light rail usage and car consumption is strongly negative, it suggests that increased use of light rail is associated with a reduction in car usage.

Multiple linear regression: Multiple Linear Regression (MLS) involves analyzing two or more independent variables in cases where only one dependent variable is used. As articulated by Berger, J. (2008), multiple regression is an adaptable technique for analyzing data that could be useful whenever a quantitative variable needs to be compared to any other element. One can investigate the impacts of one or more variables, with or without the effects of other factors taken into consideration, and relationships can be nonlinear. Independent variables can either be quantitative or qualitative. One crucial step when conducting the MLS analysis is to test the independent and dependent variables for their assumptions. Statistic Solution (2011) explains that five assumptions must be considered: firstly, there must be a linear relationship between the independent and dependent variables. Secondly, the residuals (the difference between observed values and actual values) are normally distributed. Thirdly, the independent variables must not influence one another, otherwise known as multicollinearity. The fourth assumption is that observations must be independent of one another; any observations resulting from a delayed function of previous observations are hints of autocorrelation. The final assumption is that the variance of the residuals must be consistent across all independent variables. A residual scatterplot that shows a discernible pattern may suggest the presence of heteroscedasticity. After all the assumptions are met, the variables are then inserted into the MLS model. The following model is based on the research paper from Uyanık and Güler (2013):

$$Yi = \beta 0 + \beta 1X1 + \beta 2X2 + \cdots + \beta nXn + ei \qquad (1)$$

Where:
Yi: Dependent variable
Xn: Independent variable
βn: Parameter to be estimated (slope coefficients)
β0: Constant value (y-intercept)
ei: Model's error term
n: Number of variables

In the context of this research, the model is as follows:

$$Yi = \beta 0 + \beta 1X1 + \beta 2X2 + \beta 2X2 + \beta 3X3 + \beta 4X4 + ei \quad (2)$$

Where:
Yi: Car consumption
$X1$: Intercity
$X2$: KTM
$X3$: Light rail
β0: Constant value (y-intercept)
ei: Model's error term

Econometric analysis: The third phase of the research methodology involves econometric analysis, which is a crucial component of this study. This phase works in conjunction with the descriptive analysis and correlation matrix conducted in the earlier stages. This analysis aims to discern the relationships among the independent variables; Intercity bus usage, KTM Commuter usage, and Light Rail usage and to pinpoint the most significant factor contributing to car consumption in Malaysia. By employing econometric models, the study can quantify these relationships and assess their impact on public transport usage. In this phase, the study tests three hypotheses related to car consumption and its relationship with different modes of transportation: Intercity bus usage, KTM Commuter usage, and Light Rail usage.

Hypothesis 1:
H0: There is no significant relationship between intercity bus usage and car consumption.
H1: There is a significant relationship between intercity bus usage and car consumption.

Hypothesis 2:
H0: There is no significant relationship between KTM Commuter usage and car consumption.
H1: There is a significant relationship between KTM Commuter usage and car consumption.

Hypothesis 3:
H0: There is no significant relationship between light rail usage and car consumption.
H1: There is a significant relationship between light rail usage and car consumption.

In each case, a statistical test will be conducted to determine whether to accept the null hypothesis or the alternative hypothesis. The choice between the two will depend on the p-value obtained from the test. If the p-value is less than a predetermined significance level (often 0.05), the null hypothesis is rejected in favor of the alternative hypothesis. Conversely, if the p-value is greater than the significance level, there is not enough evidence to reject the null hypothesis. The variables used in the model to study the factors relationship between car consumption and Intercity Bus Ridership, KTM Commuter Ridership, and Light Rail Ridership usage as per economic theories. Hence, we combine these factors into a multiple linear regression model, represented by the equation:

$$CC = f\,(I, KTM, LR)$$

$$lnCC = \beta_0 + \beta_1 ln\,(I) + \beta_2 ln\,(KTM) + \beta_3 ln\,(LR) + \varepsilon \quad [3]$$

Where:

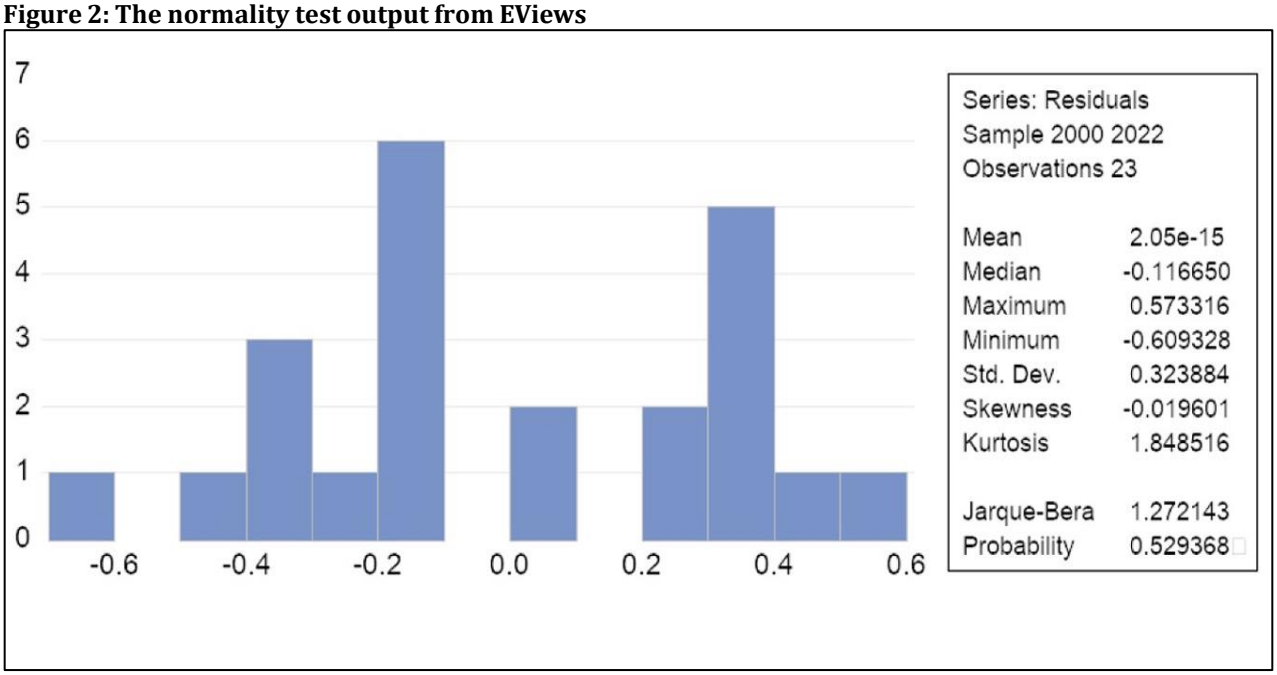
Ln (CC)	= log Car Consumption
β_0	= constant term
$\beta_1\beta_2\beta_3\beta_4$	= coefficient of independent variables
Ln (I)	= Log Intercity
Ln (KTM)	= Log KTM
Ln (LR)	= Log light rail
ε	= Error terms

4. Results

In this section, there is a detailed exploration of the results obtained from a series of tests conducted on the collected data. These tests were designed in alignment with the stated hypothesis. The results are described in detail, providing a comprehensive analysis of the outcomes derived from various studies. EViews, a statistical software, was utilized to determine the relationship between the independent and dependent variables. This approach ensures a thorough and objective examination of the data.

Descriptive analysis: The Jarque-Bera test is used in this study to confirm if the residuals of the regression model comply with the assumption of normality. The test assesses the skewness and kurtosis of the residuals, serving as a statistical measure of whether the distribution diverges from normality. A small p-value from the Jarque-Bera test indicates a departure from normality, while a larger p-value implies that the residuals might follow a normal distribution. The analysis of the residuals reveals that the mean is nearly zero, indicating that the predictions from the model are unbiased. Jarque-Bera statistic is used to test whether the data has skewness and kurtosis matching a normal distribution. Here, the Jarque-Bera statistic is 1.27, and the associated probability is 0.53. Since the probability is more than the p-value 0.05, we fail to reject the null hypothesis in which the residuals are normally distributed. Besides, a skewness of -0.02 is very close to zero, which means that the data is almost symmetric. Meanwhile, a kurtosis of 1.85 is less than 3 means that the distribution has lighter tails and a flatter peak than the normal distribution. (see figure 2)

Figure 2: The normality test output from EViews



Correlation Matrix: Table 1 explains the correlation matrix for Ln (Car Consumption), Ln Intercity, Ln KTM, and Ln Light Rail reveals that Ln (Car Consumption) negatively correlates with all public transport variables, with coefficients of -0.6026 with Ln Intercity, -0.5561 with Ln KTM, and -0.3298 with Ln Light Rail, indicating that higher car consumption is linked to lower use of these transport modes. Conversely, Ln Intercity and Ln Light Rail show a strong positive correlation of 0.9018, suggesting that increases in one are closely associated with increases in the other. Similarly, Ln KTM exhibits high positive correlations with Ln Intercity (0.8127) and Ln Light Rail (0.8763), indicating robust relationships between these public transport modes.

Table 1: Correlation Matrix

	Ln (Cars Consumption)	Ln Intercity	Ln KTM	Ln Light Rail
Ln (Cars Consumption)	1			
Ln Intercity	-0.602613716	1		
Ln KTM	-0.556107913	0.812706275	1	
Ln Light Rail	-0.329801987	0.901784264	0.876255398	1

Multiple linear regression: A multiple linear regression analysis was conducted to investigate the relationship between car consumption and several independent variables, including intercity (I), KTM Commuter (KTM) and light rail (LR). The results show that the independent variables in this case study, particularly the LR (light rail) might have a positive correlation with CC (car consumption). In contrast, there is a negative relationship between I (intercity) and KTM Commuter with CC (car consumption). The study will include an in-depth discussion of the constant terms related to each independent variable.

Interpretation of each coefficient based on the given values: The results explain that (see Table 2) a 1 percent increase in Intercity services results in a significant 95.07 percent decrease in car consumption, highlighting a strong inverse relationship between Intercity services and car use. This suggests that expanding Intercity bus services effectively reduces reliance on private vehicles. In contrast, a 1 percent increase in KTM services leads to a 50.74 percent decrease in car consumption, indicating a moderate inverse relationship. Although KTM services also reduce car usage, their impact is less dramatic than that of Intercity services. Conversely, a 1 percent increase in Light Rail services is associated with a 111.66 percent increase in car consumption, revealing a positive correlation. This unexpected result suggests that Light Rail services might be less effective at reducing car use or that increased Light Rail services might correlate with higher overall travel demand, including greater car use.

R-squared and adjusted r-squared:

$R^2 = 0.604822$

Based on the value of R-squared, approximately 60.48% of the variation in Car Consumption can be explained by the changes in Intercity bus, KTM, and Light Rail and the balance 39.52% can be explained by other factors.

$Adjusted\ R^2 = 0.542426$

Based on the value of Adjusted R-squared, approximately 54.24% of the variation in Car Consumption can be explained by the changes in Intercity bus, KTM and Light Rail and the balance 45.76% can be explained by other factors.

T-test for intercity: Using the t-test result as a basis, the Intercity t-test probability is lower than the 5% level of significance. Therefore, we discard H_0, meaning that there is an important link between Intercity bus and Car Consumption. Urbanization is the process by which a greater proportion of the population moves to live in cities, leading to an increase in the size and growth rate of urban areas. This phenomenon influences commuting patterns heavily, as it often leads to more dispersed work and living environments. Cities expand into suburbs and exurbs thereby making people cover longer distances between homes and places of work. For many people, commuting has become an essential daily activity due to the complexity and scale involved in an urban environment. Public transport systems do not always meet the demands of rapidly growing urban populations resulting in increased travel durations, crowded services, and bad schedule timings. Hence reliable, flexible, and convenient transport options for commuting have become very important now more than ever before. Often this gap might be filled by private cars whose owners can go about their business at will on time and route-wise.

T-test for KTM: The result of the t-test shows that the probability t-test for KTM is less than a 5% significance level. As such, we reject H_0, which means that there is a significant relationship between KTM commuter and Car Consumption. The influence of commuter preferences on the relationship between KTM commuter and car consumption is striking. Many commuters opt for KTM services since they are convenient, affordable, and reliable at the same time. It is on these grounds; that it is common in urban areas where people face traffic jams

every day. In other words, on congested roads with more deliveries ahead, timely arrival or call ahead can help decrease the number of vehicles by allowing rapid transit trains like KTM to stop at every station without worrying about costs because they have been paid for all passengers through their tickets before arriving at any station along its route from different terminals. To drive through such busy streets using personal cars would surely be so stressful for anybody living there for years since everyone knows how miserable it becomes during peak hours. Therefore, a decrease in transportation can also help the environment as well as make it easier for people to take their trains instead of purchasing tickets beforehand.

T-test for light rail: Grasping from the t-test statistic, the probability t-test for Light Rail is below a 5% significance level. Thus, we reject H_0, meaning there is a strong association between Light Rail and Car Consumption. An increase in both car consumption and light rail train usage can arise due to factors like urban expansion, where growing populations increase the need for various transportation systems, economic factors such as rising incomes that promote car and bus use at the same time as low fuel prices that also encourage their consumption. Integrated modes of transport could also lead to an increase in the use of both when people drive to light rail stations. Besides, traffic congestion may cause people to utilize public transport while events or tourism can be seen to stimulate simultaneously car rentals and train' use. Finally, changing travel preferences and awareness of environmental issues may lead individuals to use cars or trains depending on the situation hence contributing to their simultaneous rise.

F-test: A statistical hypothesis testing test statistic known as the F-statistic is utilized to evaluate the level to which various models are a good match for the data. For the aim of putting the hypothesis of the population mean vector to the test, the F-statistic is utilized as a generalized test statistic. To demonstrate that the estimation model is significant for at least one independent variable, the statistical significance level for this test has been set at 5%. This level of significance indicates that the test is statistically significant. The following is the process of assessing the hypothesis using the F-test on our estimation model:

$$H_0 = \beta_1 = \beta_2 = \beta_3 = 0$$
$$H_1 = At\ least\ one\ \beta_n\ not\ equal\ to\ 0$$

The p-value of the F-test for our estimation equation is 0.00428, which is less than the significance level of $\alpha = 0.05$. Therefore, we reject the null hypothesis and conclude that the model is valid, as at least one independent variable is significant in predicting car consumption in Malaysia. Consequently, car consumption, our dependent variable, can be explained by the intercity bus, KTM Commuter, and light rail in Malaysia from 2000 to 2022.

Econometric analysis: The analysis of econometrics shown in Table 2 below from the regression results provides a comprehensive understanding of the impact of different public transport modes on car consumption. The coefficient for LN_INTERCITY is -0.950769, with a standard error of 0.232740, a t-statistic of -4.085111, and a p-value of 0.0006. This negative coefficient indicates that a 1% increase in intercity public transport usage is associated with a 0.951% decrease in car consumption, a statistically significant relationship given the low p-value. Similarly, the coefficient for LN_KTM is -0.507395, with a standard error of 0.188489, a t- statistic of -2.691912, and a p-value of 0.0144. This result suggests that a 1% increase in KTM Commuter usage leads to a 0.507% decrease in car consumption. This relationship is also statistically significant, indicating that increased usage of KTM services effectively reduces car consumption. In contrast, the coefficient for LN_LIGHT_RAIL is 1.116603, with a standard error of 0.328859, a t-statistic of 3.395309, and a p-value of 0.0030. This positive coefficient indicates that a 1% increase in light rail usage is associated with a 1.117% increase in car consumption, a statistically significant relationship. This result suggests that, in this context, light rail systems may not be as effective in reducing car usage, possibly due to factors such as limited coverage or accessibility issues. The model's R-squared value is 0.604822, indicating that approximately 60.48% of the variation in car consumption can be explained by all independent variables in the equation. Another 39.52% cannot influence the change in car consumption due to missing independent variables (factors) that are not included in the model. The model has a very high explanatory power as the R^2 is more than 50%. The adjusted R-squared value is 0.542426, which accounts for the number of predictors in the model and suggests substantial explanatory power. The F- statistic of 9.693212, with a p-value of 0.000428, indicates that the overall model is statistically significant, meaning that the independent variables collectively have a significant impact on car consumption.

The model's R-squared value is 0.604822, indicating that approximately 60.48% of the variation in car consumption can be explained by all independent variables in the equation. Another 39.52% cannot influence the change in car consumption due to missing independent variables (factors) that are not included in the model. The model has a very high explanatory power as the R^2 is more than 50%. The adjusted R-squared value is 0.542426, which accounts for the number of predictors in the model and suggests substantial explanatory power. The F- statistic of 9.693212, with a p-value of 0.000428, indicates that the overall model is statistically significant, meaning that the independent variables collectively have a significant impact on car consumption. Overall, the regression results highlight the significant role of intercity buses and KTM Commuters in reducing car consumption, contributing to the mitigation of urban traffic congestion. The positive association with light rail usage suggests the need for further investigation to understand its dynamics and possibly enhance its effectiveness in reducing car usage.

Table 2: Results of Multiple Linear Regression by Using EViews

Dependent Variables: LN_CARS_CONSUMPTION_
Method: Least Squares
Date: 07/15/24. Time: 01.15
Included observations: 23

Variable	Coefficient	Std. Error	t-statistic	Prob.
LN_INTERCITY	-0.950769	0.232740	-4.085111	0.0006
LN_KTM	-0.507395	0.188489	-2.691912	0.0144
LN_LIGH_RAIL	1.116603	0.328859	3.395389	0.0030
C	9.355662	1.284142	7.285533	0.0000
R-squared	0.604822	**Mean dependent var**		11.62344
Adjusted R-squared	0.542426	**S.D dependent var**		0.515220
S.E. of Regression	0.348517	**Akaike info creation**		0.886511
Sum squared resid	2.307816	**Schwarz criterion**		1.083988
Log-likelihood	-6.194874	**Hannan-Quinn criteria.**		0.936176
F-statistic	9.693212	**Durbin-Watson stat**		0.673236
Prob(F-statistic)	0.000428			

Discussion

The regression analysis reveals that increasing intercity bus usage and KTM Commuter usage drastically decreases car consumption. More specifically, a 1% increase in intercity transport usage corresponds to a 0.951% decrease in car consumption, and a 1% increase in KTM Commuter corresponds to a 0.507% decrease. The relationships are statistically significant with p-values of 0.0006 and 0.0144, respectively. Results suggest that these modes of transport all make useful contributions to reducing car use and can contribute to the alleviation of urban traffic congestion. Light rail use, however, is associated with a car consumption increase of 1.117%, suggesting that light rail may not be so useful in reducing car use, perhaps because of low coverage or accessibility. The R-squared value is 0.604822, indicating that the independent variables explain approximately 60.48% of the variation in car consumption. This indicates high explanatory power, which is confirmed by an Adjusted R-squared of 0.542426 with an F-statistic of 9.693212 and a p-value of 0.000428. Overall, there is very great potential for both intercity and KTM services in reducing car consumption, but further study of light rail systems needs to be conducted.

5. Managerial Implications and Recommendations

In the regression analysis, it is seen that intercity and KTM Commuter usage significantly decrease car consumption; this proves to be efficient in reducing personal vehicle use. Light rail use is positively related to car consumption, which may be due to limited coverage or poor connectivity. Therefore, if managers are to have the best impact on car use, they should first focus on the expansion and integration of intercity and KTM services and secondly review and improve light rail coverage and connectivity. Further research is required to determine the factors that affect the effectiveness of light rail and to find other variables influencing car consumption. When analyzing the connection between car usage and public transport in urban settings, quantitative methods typically suggest an inverse relationship. These approaches often assume that public transport is universally accessible, and that income level is the main factor influencing its use. However, these

assumptions oversimplify complex behaviors, as individuals may choose between transport options based on their specific situations, and access to public transport can vary widely. Moreover, these models tend to assume that preferences are rational and remain consistent over time, overlooking emotional or habitual factors. The next study by the researcher should consider variations in infrastructure, behavioral and socioeconomic factors, and temporal changes, and complement quantitative data with qualitative insights.

In addition, several promotional and incentive policies can be carried out to increase the use of public transport for a better shift away from dependency on cars. Managers should focus on the following things to maximize the reduction in car consumption: First, they should improve the coverage, frequency, and reliability of the intercity and KTM services so that they are much better than driving. Second, light rail systems will have more power to reduce car use if their limitations are addressed. This can be further explored to identify the underlying issues with light rail services and increased car consumption. With the explanation power of 60.48% of the model, managers can exploit other causative factors to car consumption like urban planning and socio-economic conditions. Incentives aimed at the use of all forms of public transport will still be necessary to attract people away from cars and into more sustainable forms of transportation. Also, integrating different means of transport such as park-and-ride facilities can help in making transitions smoother between modes. Sustainability is supported by leveraging technology for real-time tracking and data-driven route optimization as well as investing in green emission transport. Additionally, awareness campaigns, workplace programs, and better urban design that favors walking or cycling would also encourage people to use public transport instead of traveling in their cars.

Conclusion

In terms of car consumption against public transport usage, some important lessons in urban mobility are thrown out. Generally, when there was more increase in the number of public transportation facilities, like Intercity bus and KTM services, car consumption decreased. The well-developed public transport system, easily available, reduces dependence on private vehicles and thus helps in lessening traffic congestion. This contributes to environmental sustainability. Conversely, a different effect pattern was found for Light Rail services, whose increase showed an increase in car consumption. The evidence here is that Light Rail does not always effectively reduce car use or, indeed, that its expansion can be linked to increased overall travel demand—including car use. These findings underline the need to enhance public transport systems to encourage a shift from private vehicle use. Strategies should be focused on the improvement of the quality, accessibility, and integration of public transport, in a way that creates a more balanced and sustainable urban mobility environment.

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Consumer Green Products through the Lens of Bibliometrics: Trends analysis

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Abstract: The growth of articles is reflected in the increasing interdisciplinary research and publications on consumer green products. Scholars from fields as diverse as business, management and accounting, environmental science, social science, and engineering have contributed to more than 400 publications. This article aims to understand the growth of green consumer products by using bibliometric analysis. With the limitation set only for the final stage and English used, a total of 1961 articles were published in the Scopus database from 1990 to 2024. The analysis of document and source types, top keywords, and other bibliometric indicators was explained. In addition, Publish or Perish software was used to analyze citation metrics and highly cited articles. As the global focus on sustainability intensifies, research in this field will likely continue to grow. Future studies should lengthen this work to other article databases such as WOS and Google Scholar to understand how consumer green products can contribute to a more sustainable business future. Besides that, the researcher also can explore how the green marketing mix influences consumer intention to purchase green products available in the market.

Keywords: *Consumer, Green Products, Bibliometric Analysis, Product Strategy, Sustainable business*

1. Introduction

The growing concern over environmental degradation has led to a significant shift in consumer behavior towards more sustainable and eco-friendly choices. Liu (2024) reveals that environmentally sustainable products have emerged as a crucial approach for enterprises in addressing the increasing ecological consciousness prevalent among consumers. Consumer green products have minimal negative environmental impact and have gained considerable attention recently. These products are distinguished by their lower environmental impact, beneficial health attributes, and encouragement of sustainable consumption practices (Jaiswal & Kant, 2018). Consumer green products encompass a broad range of categories, including organic food, energy-efficient appliances, biodegradable materials, and products made from recycled resources.

Malaysia is also committed to encouraging and supporting companies that produce consumers green products. In 2023, the Malaysian Green Technology and Climate Change Corporation (MGTC) in collaboration with Shopee Malaysia successfully organized a campaign "Jom Beli Product Hijau" for four months from September to December 2023. This campaign was held to introduce and promote the MyHIJAU Mark Recognition Scheme for certified green products and services among Malaysian consumers. A total of 1178 local sellers offer more than 3000 green products including paper products, paint, cleaning products, biomass packaging and kitchenware. The result has shown that paper products achieved 73% contributing the highest sales, followed by 17% for paint products, 9% for cleaning products and 1% for biomass packaging and kitchenware. This demonstrates the strong support of consumers and environmentally friendly purchasing habits (MGTC, 2024). The rise of consumer green products is not just a trend but a reflection of increasing societal commitment to sustainability and responsible consumption. In response, this study utilizes a bibliometric approach, which entails a quantitative analysis of publishing trends, citations, and subject content within academic works. Through methodical analysis of the literature, this study seeks to identify the main contributors that contributed to the discussion on consumer green products and reveal developing patterns that impact consumer behavior towards environmentally friendly products.

The goals of this study are twofold: first, to investigate the research trends and productivity related to consumer green products through a bibliometric analysis spanning from 1991 to 2024, with a focus on the

keywords used in the examined publications. Second, to assess the frequency and impact of these keywords found in titles and abstracts by considering the number of times other researchers have cited them.

2. Literature Review

The increasing awareness of environmental sustainability has led to a significant shift in consumer behavior towards green products. Green products, also called eco-friendly or sustainable products, are designed to minimize environmental impact through various means, such as reduced energy consumption, recyclable materials, or environmentally responsible production methods. Green products have gained significant traction recently, driven by the growing concern for environmental sustainability and consumer demand for eco-friendly alternatives (Bhardwaj et al., 2020). This shift not only reflects a change in purchasing habits but also encourages companies to innovate and adopt sustainable practices throughout their supply chains. Ranganath and Nishadi (2022) revealed the expanding market demographic for eco-friendly products within the fast-moving consumer goods (FMCG) sector implying that marketers can secure a competitive advantage by appealing to environmentally conscious consumers.

Research on green behavior has expanded significantly in recent decades, but several gaps remain. Based on the research by Maichum et al. (2016), the main factors influencing consumers' purchase intention towards green products are consumer attitude, subjective norm, and perceived behavioral control. Additionally, environmental concern plays a significant role, directly influencing attitude, perceived behavioral control, and purchase intention. While environmental knowledge does not directly affect purchase intention, it does have an indirect impact through its influence on attitude, subjective norms, and perceived behavioral control. Studies often focus on consumer intent rather than actual purchases, limiting practical insights (Bravo et al., 2022). Additionally, exploring multifaceted areas of consumer behavior and improving existing social psychological models could enhance the understanding of green consumer attitudes and behaviors (Samarasinghe, 2012). Existing research often relies heavily on the Theory of Planned Behavior to explain green product purchasing. While this theory provides a valuable framework, it may not fully capture the complexity of green behavior. Theoretical gaps include the need for more comprehensive models beyond the Theory of Planned Behavior to explain green purchasing phenomena (Tafsir et al., 2016).

Sustainability and environmental consciousness have become increasingly important considerations for consumers in recent years, leading to a growing demand for green products that are perceived to have a lower environmental impact. In promoting eco-friendly attributes, companies need to improve on clarity, credibility, and emotional engagement. Environmental messages should be straightforward, as even simple syntactic formulations might provoke skepticism on the part of consumers (Dangelico & Vocalelli, 2017). Companies should ensure their claims are honest and transparent, building trust with stakeholders through credible communication (Dangelico & Vocalelli, 2017; Delmas & Burbano, 2011). Credible labels such as Energy Star and USDA organic labels help consumers distinguish new green products and reduce confusion from misleading labels (Delmas & Burbano, 2011). Marketing messages should evoke emotional responses, particularly targeting demographics like young consumers who are more likely to engage with passionate appeals about environmental responsibility (Lee, 2009). Therefore, integrating sustainability in brand management can also strengthen consumer-brand relationships, enhance brand loyalty, and improve the firm's image in public (Ginsberg & Bloom, 2004). By combining these strategies, companies can effectively convey their eco-friendly attributes and differentiate themselves in the market.

In addition, marketing green products to consumers faces several key challenges. According to Gleim et al. (2013) and Ottman et al. (2006), the susceptibility to pricing remains a significant barrier, as a notable portion of consumers perceive eco-friendly products as more expensive without apparent benefits, leading to a marked distrust concerning their value. Additionally, a lack of awareness among consumers about the environmental advantages and features of consumer green products hinders their willingness to buy, emphasizing the need for successful educational tactics to improve consumer comprehension (Paul et al., 2016). In addition, companies must contend with the challenges of competing claims and the issue of greenwashing, where deceptive information can undermine trust and make consumer decision-making more difficult. To overcome these obstacles, brands should implement transparent marketing strategies that communicate the genuine benefits of their products, thereby cultivating a better-informed consumer base.

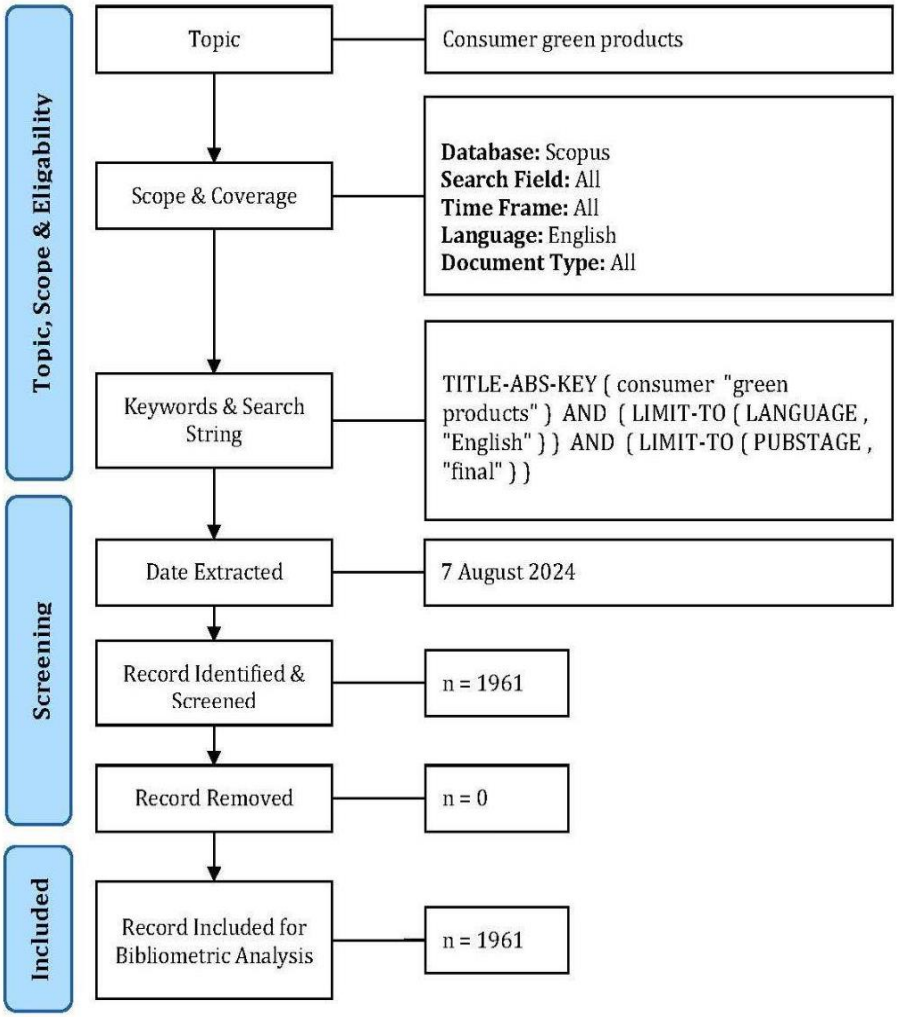
3. Methodology

This study leverages a bibliometric approach, employing quantitative analysis to examine publication patterns and citations within the scholarly discourse on consumer green products. The bibliometric method enables a comprehensive examination of the field's evolution, thereby providing insight into the influential works and authors that have significantly contributed to developing knowledge surrounding consumer green products. The present bibliometric analysis employed the Scopus database as the primary source for data extraction. This choice is grounded in Scopus's recognition as one of the most prominent academic databases currently available. With approximately 1,961 documents identified, the Scopus database provided a comprehensive foundation for the data collection essential to this study.

A series of searches were conducted that used the following keyword string: TITLE-ABS-KEY (consumer "green products") AND (LIMIT-TO (LANGUAGE, "English")) AND (LIMIT-TO (PUBSTAGE, "final"))

This Scopus search generated 1961 documents, as stated in Figure 1. The search was conducted on August 7, 2024, and was limited to English documents and the final publication stage. In addition, tools such as Microsoft Excel and Publish or Perish software were used for further analysis.

Figure 1: PRISMA Flow Diagram



Source: Zakaria et al. (2021)

4. Results

The analysis for the extracted academic work in the search process was based on the following attributes: (1) document types; (2) year of publications; (3) languages of documents; (4) subject area; (5) most active source title; (6) keywords analysis; (7) most influential countries and; (8) citation analysis.

Document types

Table 1 analyzes the types of documents published in a particular dataset, classified by their document type. The data includes the total number of publications (denoted as "Total Publications" or "TP") for each document type and their respective percentages of the total publications. Most publications, 1,557 in total, are articles, constituting 79.40% of the entire dataset. This suggests that traditional research articles are the most prevalent publication type in this context.

Conference papers account for 10.30% (202 publications), followed by book chapters at 6.32% (124 publications). Reviews represent 3.26% of the dataset, with 64 publications, while books, conference reviews, editorials, short surveys, and retracted documents are less prevalent, collectively comprising the remaining 0.72%. The dominance of articles suggests a strong emphasis on traditional research dissemination, with other forms of scholarly communication contributing to a lesser extent.

Table 1: Document Types

Document Type	Total Publications (TP)	Percentage (%)
Article	1557	79.40
Conference Paper	202	10.30
Book Chapter	124	6.32
Review	64	3.26
Book	8	0.41
Conference Review	3	0.15
Editorial	1	0.05
Short Survey	1	0.05
Retracted	1	0.05
Total	**1961**	**100.00**

Year of Publications

Research on green consumer products has evolved significantly since its inception in 1990, as the publication data indicates. The field experienced gradual growth in scholarly output, with a notable acceleration in the 21st century, aligning with the increasing global awareness of sustainability and environmental issues. By 2023, this area of research had reached its peak, with 268 publications accounting for 13.67% of the total output, as stated in Table 2. This surge in 2023 underscores the growing academic interest and the urgent need for sustainable consumer practices. As research expands, the cumulative percentage distribution shows that recent years have contributed substantially to the body of knowledge in this domain, indicating that the topic of green products has gained prominence in the academic discourse.

Table 2: Year of Publications

Year	Total Publications (TP)	Percentage (%)	Cumulative Percent (CF)
2024	167	8.52	8.52
2023	268	13.67	22.19
2022	239	12.19	34.37
2021	200	10.20	44.57
2020	185	9.43	54.01
2019	137	6.99	60.99
2018	118	6.02	67.01
2017	109	5.56	72.57
2016	70	3.57	76.14
2015	83	4.23	80.37
2014	66	3.37	83.74

2013	59	3.01	86.75
2012	47	2.4	89.14
2011	36	1.84	90.98
2010	25	1.27	92.25
2009	32	1.63	93.88
2008	16	0.82	94.70
2007	16	0.82	95.52
2006	16	0.82	96.33
2005	9	0.46	96.79
2004	3	0.15	96.94
2003	8	0.41	97.35
2002	7	0.36	97.71
2001	3	0.15	97.86
2000	9	0.46	98.32
1999	9	0.46	98.78
1998	3	0.15	98.93
1997	4	0.20	99.14
1995	5	0.25	99.39
1994	4	0.20	99.60
1993	3	0.15	99.75
1992	2	0.10	99.85
1991	1	0.05	99.90
1990	2	0.10	100.00
Total	1961	100.00	

Languages of Documents

The decision to select only English-language documents for analysis is rooted in recognizing English as the globally dominant language of academic communication. This linguistic choice is essential for ensuring that the research aligns with the broader academic community, where English serves as the primary medium for scholarly discourse. The predominance of English in academia is well-established, making it the preferred language for publishing and disseminating research across diverse fields.

By focusing exclusively on English-language documents, the analysis benefits from a vast and comprehensive dataset that is more likely to be cited and engaged with by scholars from various geographical regions. This ensures the findings are accessible and relevant to a broader international audience, enhancing the study's impact and integration within the global academic landscape. Therefore, prioritizing English-language documents supports the goal of contributing to the universal body of knowledge while fostering inclusive and collaborative academic dialogue.

Subject Area

Table 3 summarises the publications based on the subject area. It demonstrates that the most significant number of publications were categorized under “business, management, and accounting,” with 888 (45.28%) publications. This is followed by “environment science” (32.59%), “social sciences” (24.99%), “engineering” (24.48%), “energy” (17.49%), “computer science” (16.57%), and “economics, econometrics and finance” (16.47%). Other subject areas were below 8% of the total publications, including decision sciences, mathematics, psychology, agricultural and biological sciences, arts and humanities, materials science, medicine, earth and planetary sciences, multidisciplinary, biochemistry, genetics and molecular biology, chemical engineering, and chemistry.

Table 3: Subject Area

Subject Area	Total Publications (TP)	Percentage (%)
Business, Management and Accounting	888	45.28
Environmental Science	639	32.59
Social Sciences	490	24.99
Engineering	480	24.48
Energy	343	17.49
Computer Science	325	16.57
Economics, Econometrics and Finance	323	16.47
Decision Sciences	150	7.65
Mathematics	120	6.12
Psychology	99	5.05
Agricultural and Biological Sciences	77	3.93
Arts and Humanities	63	3.21
Materials Science	62	3.16
Medicine	60	3.06
Earth and Planetary Sciences	43	2.19
Multidisciplinary	30	1.53
Biochemistry, Genetics and Molecular Biology	28	1.43
Chemical Engineering	28	1.43
Chemistry	25	1.27

Most active source titles

Table 4 addresses the most active source titles on consumer green products. The highest source was Sustainability Switzerland, with 136 (6.49%) publications. The second and third highest were the Journal of Cleaner Production and Development in Marketing Science Proceedings of the Academy of Marketing Science, with 107 and 35 publications. Followed by Business Strategy and The Environment, Frontiers in Psychology, Environmental Science and Pollution Research, Journal of Retailing and Consumer Services, Computers and Industrial Engineering, IOP Conference Series Earth And Environmental Science and Journal of Consumer Marketing.

Table 4: Most Active Source Title

Source Title	Total Publications(TP)	Percentage (%)
Sustainability Switzerland	136	6.49
Journal Of Cleaner Production	107	5.46
Developments In Marketing Science Proceedings Of The Academy Of Marketing Science	35	1.78
Business Strategy And The Environment	28	1.43
Frontiers In Psychology	26	1.33
Environmental Science And Pollution Research	25	1.27
Journal Of Retailing And Consumer Services	25	1.27
Computers And Industrial Engineering	22	1.12
IOP Conference Series Earth And Environmental Science	21	1.07
Journal Of Consumer Marketing	21	1.07

Keywords Analysis

Next, Table 5 presents the top keywords used by authors in a dataset, highlighting the focus areas within the research. "Green Products" is the most frequently used keyword, appearing in 515 publications and accounting for 26.26% of the total, indicating a strong emphasis on eco-friendly products. "Sustainable Development" follows with 242 mentions (12.34%), reflecting the significance of long-term ecological balance in the research. "Green Marketing" and "Sustainability" are also prominent, appearing in 209 (10.66%) and 205 (10.45%) publications, respectively, underscoring the importance of environmental considerations in marketing and broader sustainability themes. Keywords related to consumer behavior, such as "Sales" (194 publications, 9.89%) and "Consumer Behavior" (193 publications, 9.84%), demonstrate an interest in how sustainability

impacts consumer actions. Other notable keywords include "Commerce," "Marketing," and "Purchase Intention," each appearing in approximately 8-9% of the publications, further emphasizing the intersection of sustainability with market dynamics and consumer decision-making processes. Overall, the keyword analysis reveals a strong focus on environmental sustainability and its implications for consumer behavior and marketing within the research domain.

Table 5: Top Keywords

Author Keywords	Total Publications (TP)	Percentage (%)
Green Products	515	26.26
Sustainable Development	242	12.34
Green Marketing	209	10.66
Sustainability	205	10.45
Sales	194	9.89
Consumer Behavior	193	9.84
Consumption Behavior	186	9.48
Green Product	176	8.98
Commerce	172	8.77
Marketing	161	8.21
Purchase Intention	135	6.88
Green Consumption	125	6.37

In this study, the authors' keywords were systematically analyzed to identify prevalent themes and concepts within the dataset. This analysis was visually in Figure 2 which was represented by generating a word cloud using the WordArt online generator (WordArt, 2024). A word cloud is a strategic choice, as it identifies frequently occurring terms, thereby highlighting the central topics and trends within the literature. WordArt, an accessible and widely used tool, allows for visualizing keyword frequency, providing a clear and immediate representation of the data's thematic distribution. This method enhances the interpretability of the results. It summarises the dominant themes across the analyzed documents, contributing to a deeper understanding of the research focus areas.

Figure 2: Top Keywords



Most influential countries

This study also presents the most active countries that published documents on consumer green products. Table 6 recorded the top countries that contributed to the publications: China, India, United States, and Malaysia, with over 100 publications, while the rest contributed a minimum of 50 total publications.

Table 6: Top Countries Contributed to the Publications

Country	Total Publications (TP)	Percentage (%)
China	487	24.83
India	271	13.82
United States	253	12.90
Malaysia	150	7.65
Taiwan	91	4.64
Indonesia	86	4.39
Italy	61	3.11
United Kingdom	59	3.01
Canada	58	2.96
Australia	53	2.70
South Korea	50	2.55

Citation Analysis

Harzing's Publish or Perish software was used to obtain the citation metrics for the data retrieved from the Scopus database. Table 7 presents the citation metrics for the retrieved documents as of August 7, 2024. The brief description includes the total number of citations, along with citations per year, citations per paper, and citations per author. There were 1,961 papers with 70,807 citations, averaging 2,082.56 citations per year for consumer green products publications. Each paper was cited an average of 36.11 times, and the total h-index and g-index for all publications were 133 and 218, respectively.

Table 7: Citations Metrics

Metrics	Data
Publication years	1990-2024
Citation years	34 (1990-2024)
Papers	1961
Citations	70807
Citations/year	2082.56
Citations/paper	36.11
Citations/author	32223.59
Papers/author	839.60
h-index	133
g-index	218

Next, this paper presents the top 25 most cited articles on consumer green products, as listed in Table 8. The most cited article is by V. Griskevicius, J.M. Tybur, and B. Van den Bergh, titled "Going Green to Be Seen: Status, Reputation, and Conspicuous Conservation," with a total of 1,414 citations. This is followed by the article "Predicting Green Product Consumption Using the Theory of Planned Behaviour and Reasoned Action" by J. Paul, A. Modi, and J. Patel.

Table 8: Highly Cited Articles

No.	Authors	Title	Year	Cites	Cites per Year
1	V. Griskevicius, J.M. Tybur, B. Van den Bergh	Going Green to Be Seen: Status, Reputation, and Conspicuous Conservation	2010	1414	101.00
2	J. Paul, A. Modi, J. Patel	Predicting green product consumption using the theory of planned behavior and reasoned action	2016	1269	158.63
3	M.A. Delmas, V.C. Burbano	The drivers of greenwashing	2011	1118	86.00
4	R. Yadav, G.S. Pathak	Young consumers' intention towards buying green products in a developing nation: Extending the theory of behavior behavior	2016	882	110.25
5	C. Tanner, S.W. Kast	Promoting Sustainable Consumption: Determinants of Green Purchases by Swiss Consumers	2003	760	36.19
6	R. Yadav, G.S. Pathak	Determinants of Consumers' Green Purchase Behavior in a Developing Nation: Applying and Extending the Theory of Planned Behavior	2017	737	105.29
7	D. Ghosh, J. Shah	Supply chain analysis under green sensitive consumer demand and cost-sharing contract	2015	663	73.67
8	J. Pickett-Baker, R. Ozaki	Pro-environmental products: Marketing influence on consumer purchase decision	2008	653	40.81
9	J. Rana, J. Paul	Consumer behavior and purchase intention for organic food: A review and research agenda	2017	643	91.86
10	B.B. Schlegelmilch, G.M. Bohlen, A. Diamantopoulos	The link between green purchasing decisions and measures of environmental consciousness	1996	621	22.18
11	N. Mazar, C.-B. Zhong	Do green products make us better people?	2010	616	44.00
12	M.R. Gleim, J.S. Smith, D. Andrews, J.J. Cronin	Against the Green: A Multi-method Examination of the Barriers to Green Consumption	2013	547	49.73
13	Z. Hong, X. Guo	Green product supply chain contracts considering environmental responsibilities	2019	521	104.20
14	P.-C. Lin, Y.-H. Huang	The influence factors on choice behavior regarding green products based on the theory of consumption values	2012	515	42.92
15	K. Nuttavuthisit, J. Thøgersen	The Importance of Consumer Trust for the Emergence of a Market for Green Products: The Case of Organic Food	2017	476	68.00
16	D. Jaiswal, R. Kant	Green Purchasing behaviour: A conceptual Framework and empirical Investigation of Indian Consumers	2018	466	77.67
17	D. Kammerer	The effects of customer benefit and regulation on environmental product innovation. Empirical evidence from appliance manufacturers in Germany	2009	459	30.60

18	J.A. Ottman, E.R. Stafford, C.L. Hartman	Avoiding green marketing myopia: Ways to improve consumer appeal for environmentally preferable products	2006	447	24.83
19	J.M. Ginsberg, P.N. Bloom	Choosing the right green marketing strategy	2004	441	22.05
20	K. Lee	Gender differences in Hong Kong adolescent consumers' green purchasing behavior	2009	423	28.20
21	A.K. Moser	Thinking green, buying green? Drivers of pro - Environmental Purchasing Behavior	2015	420	46.67
22	J.F. De Medeiros, J.L.D. Ribeiro, M.N. Cortimiglia	Success factors for environmentally sustainable product innovation: A systematic literature review	2014	418	41.80
23	R.M. Dangelico, D. Vocalelli	"Green Marketing": An analysis of definitions, strategy steps, and tools through a systematic review of the literature	2017	415	59.29
24	K. Maichum, S. Parichatnon, K.-C. Peng	Application of the extended theory of planned behavior model to investigate purchase intention of green products among Thai consumers	2016	406	50.75
25	S. Gupta, D.T. Ogden	To buy or not to buy? A social dilemma perspective on green buying	2009	405	27.00

5. Conclusion

The growing demand for consumer green products presents both challenges and opportunities. This study provides a comprehensive overview of the prevailing landscape of research on consumer green products through bibliometric analysis. By exploring key trends and the evolution of research topics in this area, the study underscores the increasing significance of sustainability and environmental concerns in consumer behavior. The findings suggest that engaging consumers with green products represents one of the emerging directions in environmental studies, which has garnered growing attention in recent years. Additionally, the analysis reveals the interrelations among topics such as green marketing, sustainable consumption, and eco-friendly product development, indicating a holistic approach to understanding consumer preferences and behaviors related to green products. To enhance this study, future research could prioritize documents that contribute to a more precise understanding of the results. It is recommended that future research examine the comparative success and acceptance of various forms of consumer green product categories available in the market. Furthermore, it is also suggested that researchers explore how green labelling, green advertising and green promotion might influence consumer intention to purchase green products.

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The Impact of Student Attitude on Information, Communication, Creation Skills and Student Engagement

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Abstract: The Malaysian education system is guided by the Malaysia Education Blueprint, which drives the overall quality and effectiveness of education in the country. This study provides insights and assists in forming informed guidelines for the Ministry of Education regarding the impact of skill factors. The relationship between the direct effects of these three primary skills and attitudes is supported by Self-Efficacy Theory (SET). The indirect relationship, where attitude mediates the effects of these skills on student engagement, is supported by Self-Determination Theory (SDT) and Social Cognitive Theory (SCT). A questionnaire was distributed to local university students currently in their fourth semester and analyzed using the Structural Equation Model using Partial Least Square (PLS). The structural model results direct relationship between attitude and student engagement and between information skills and attitude. In addition, the mediation analysis shows that the relationship between information skills and student engagement, mediated by student attitude, was significant. Based on these results, it is recommended that the Ministry of Education focus on providing supportive resources, such as learning environments and training for educators, in the upcoming Malaysia Education Blueprint for 2026 to 2036. Additionally, offering Digital Literacy Programs to equip students with information skills can positively influence student attitudes and thereby increase the level of student engagement, which is crucial for improving the academic performance and achievement of Malaysia's educational system. Future research should include a cross-cultural comparison to reconsider educational theories for Asian countries, as many theories are currently based on Western educational settings and contexts.

Keywords: *Malaysia Education Blueprint, Student Engagement, Student Attitude, Information Skills, Communication Skills, Creation Skills.*

1. Introduction and Background

Research Background

This study focuses on educational research in Malaysia, specifically examining factors influencing student engagement, a key determinant of academic quality and educational success. The primary factors investigated include information skills, communication skills, and creation skills, while also exploring how attitudes serve as mediating variables in this relationship. The Malaysia Education Blueprint (2013-2025) outlines a vision for the education system, evaluating Malaysia's past performance against international benchmarks. Based on these evaluations, the Ministry of Education suggests strategic moves and operational shifts necessary to achieve this vision. Essentially, the Blueprint serves as a roadmap and guide for the entire education system, identifying areas for reform to achieve specific educational objectives (FMT Reporters, 2024).

In its latest version, the Blueprint highlights significant issues affecting Malaysian students from preschool to post-secondary and higher education levels, emphasizing that student engagement is a critical factor influencing educational outcomes in Malaysia (Ministry of Education Malaysia, 2015). Table 1 summarizes the relevant issues related to student engagement, particularly highlighting the three primary factors (information, communication, and creation skills) and the attitude-related issues affecting student engagement as identified in the Blueprint. It also outlines initiatives suggested by the Ministry of Education for each issue aimed at achieving the Blueprint's objectives.

Table 1: Issues and Initiatives of the Malaysia Education Blueprint (2013-2025)

Issues on Attitude	Initiative
Low Motivation and Engagement: Students may not feel motivated to engage in learning activities due to a lack of relevance and connection to their future aspirations.	**Student-centered Learning:** Promote student-centered and personalized learning approach to make education more relevant and engaging. **Career Guidance:** Integrate a career guidance program to help students see the relevance of their education to their future goals.
Negative Perceptions of Learning: Students may have negative attitudes towards learning due to experience or a lack of supportive learning environments.	**Transformative Teaching and Learning Environments:** Create positive, supportive and inclusive classroom environments to shift negative attitudes toward learning.
Issues with Information Skills	**Initiative**
Inadequate Information Literacy: Students may lack the skill to effectively find, evaluate and use information	**Improving Structures:** Improve infrastructures and resources, particularly in rural and underserved areas to ensure equitable access to information.
Limited Access to Information Resources: Unequal access to libraries, digital resources and other information tools can hinder student's ability to engage fully in their study.	
Issues with Communication Skills	**Initiative**
Language Proficiency Barriers: Students struggling with proficiency in Bahasa Melayu and English may find it difficult to participate fully in class	**Language Proficiency Programs:** Implement a program to ensure all students are proficient in both Bahasa Melayu and English including additional support for those struggling with language skills.
Poor Communication Skills: Students may lack effective verbal, nonverbal and written communication skills affecting their engagement.	**Holistic Education**: Develop students holistically with a balanced focus on academic skills, communication, creativity and critical thinking.
Issues on Creation Skills	**Initiative**
Lack of Opportunity for Creative Expression: A rigid examination-focused curriculum may limit opportunities for creativity and innovation.	**Balance Curriculum:** Promote a balanced curriculum that includes creative and critical thinking skills.
Insufficient Encouragement for Innovation: Students may not be encouraged to innovate or think critically, leading to passive learning experiences.	**High-Order Thinking Skills:** Encourage the development of higher-order thinking skills and creativity to prepare students for future challenges.

Problem Statement

Many researchers focus on the relationship between student attitudes and study engagement, but there is a lack of investigation into the root causes, specifically the deficiency in essential skills, that impact student attitudes. Due to the limited research, this study examines how information skills, communication skills, and creation skills influence student attitudes. Additionally, there are insufficient studies on how attitudes mediate the relationship between these primary skills and student engagement. Understanding this relationship can provide valuable evidence-based insights for long-term policies in Malaysia, aiding educators and policymakers in refining the upcoming Malaysia Education Blueprint (2026-2036) (Rajaendram, 2024). By focusing on building essential skills in students, these policies can drive positive student attitudes towards learning, leading to high student engagement and thereby improving Malaysia's academic achievement. Hence, there are four research questions developed for this study as follows:

RQ1: How do information skills influence student attitudes?
RQ2: How do communication skills affect student attitudes toward learning?
RQ3: What is the impact of creation skills on student attitudes?
RQ4: How does student attitude mediate the relationship between these skills and student engagement?

2. Literature Review

Student Engagement

Student engagement is the combination of internal thoughts and external behavior. Other researchers simplify it as a student's willingness to participate, be involved, interact, and commit to being successful in the learning process (Gray & DiLoreto, 2016). Researchers further detailed student engagement in three dimensions: cognitive engagement refers to the level of concentration a student is willing to invest in self-learning activities; behavioral engagement demonstrates the student involvement and participation rate in learning activities; and emotional engagement is the mental health support provided by the institution or community, giving a sense of belonging and love (Fredricks, Bluemenfeld, & Paris, 2004). Ginting (2021) proves that the more satisfied students are with these three dimensions, the higher their learning motivation, making them more likely to engage in class. Hence, educators need to keep track of the active level of student engagement in class, as studies have further proven that student engagement determines educational achievement by reflecting student learning outcomes and levels of interest (Li & Xue, 2023).

Skills: The meaning of digital skills has shifted from a technical orientation toward a broader perspective that considers content-related or higher-order skills (Claro et al., 2012). The importance of these skills to fulfilling the demands of workers in the 21st century has been well established; research has identified comprehensive knowledge about skills and based on major researchers identified seven core skills supported using ICT consisting of technical, information management, communication, collaboration, creativity, critical thinking, and problem-solving However, in this study limit to investigate the information skills, communication skills and creation skills.

Information skills, the ability of individuals to recognize specific information needs, find, evaluate, and use information effectively, assist students in satisfying changing information needs and contribute to the development of self-directed and lifelong learning (Laar, Deursen, Dijk, & Haan, 2017). According to the Malaysian Qualification Agency (2007), information skills are a desirable learning outcome, especially for higher education students, as they are not only knowledge that can be proven with a certificate, but also skills and attitudes that require demonstration and application in the ability to research, access credible sources, and apply information searches to various contexts (Karim, Din, & Razak, 2011).

Communication is not just about language and is often misinterpreted (Lynch, 1996). Instead, communication skills are the ability to convey ideas through verbal (spoken or written) and non-verbal (emotional expression) methods, from the person sending (speaker or writer) the information to the person receiving (listener or reader) the information, sometimes with feedback (Gioiosa & Kinkela, 2019). Effective communication is crucial in education as the repetition of the communication process creates knowledge by delivering meaningful information (Khoiriah, Suyatna, Abdurrahman, & Jalmo, 2023). From an educational perspective, communication skills are often applied in group work involvement, presentations, and writing assignments, expressing students' thoughts and communicating learning outcomes with educators (Iksana, et al., 2012). However, researchers highlight that communication skills are not only academically necessary but are also everyday life skills that can be used to make a significant impact (Rayna & Striukova, 2021).

Creation skills are broadly known by their synonym, 'creative skills.' Some researchers define them as the ability to generate new ideas and think creatively, while others view them as the ability to look at problems and situations from different perspectives, or simply as thinking outside the box (Parkhaust, 1999). Torrance (1974) suggests that to be creative, an individual must be sensitive to problems and capable of facing challenging and difficult situations where information is scarce and solutions are needed. This can be exemplified by the creativity of Steve Jobs, the CEO of Apple Inc., who defined creativity as "just concerning things" (Henriksen & Mishra, 2014).

Surprisingly, creation skills need to be accompanied by the two primary skills previously mentioned (information and communication). Being a good communicator is one of the main characteristics of a creative thinker, as individuals must be able to express their creativity through listening and communicating. Additionally, creativity plays a role in handling information, requiring information skills to identify relevant information, obtain new viewpoints, and make unusual connections (Birgili, 2015). From an educational perspective, creativity is an essential asset used in problem-solving activities and project-based learning (Mizal

& Al-Noori, 2020).

Attitude: Sabel (2006) viewed attitude as a psychological internal factor that leads to the manner of acting, feeling, and thinking. It can reflect individual behavior, perception, judgment, and opinion toward situations and environments. (Bizer, Barden, & Petty, 2006). For instance, liking or disliking, favoring or disfavouring, approving or disapproving – any psychological tendency can be shown in a person's attitude (Haddock & Maio, 2008). In this study, an attitude refers to students' behavior towards learning and influences their beliefs about learning. Researchers highlight that a positive attitude will not only affect the amount of time a student is willing to spend on learning but also their desire and interest in education, as seen in their level of attention and extra effort (Blazar & Kraft, 2017). This is further concluded by other researchers, who found that positive attitudes can, in turn, drive academic performance and educational success by increasing students' well-being in the classroom (Bangkok, Dino, Aspacio, & Moneva, 2019).

Hypothesis Development

Skills and Attitude: Gungor (2021) defined attitude as the mental preparedness provided by the skills equipped and viewed education as a process of individuals acquiring new skills that drive the attitude and behavior of future life. Self-efficacy theory, proposed by Albert Bandura in 1977, explains that an individual's belief in their ability to succeed or accomplish certain tasks and carry out necessary actions to manage future situations has a significant impact on their behavior and attitude. Pintrich & Schunk (2022) summarize it simply as students asking themselves, "Do I have the ability to complete the task in this situation?" Hence, the stronger the belief or the higher the self-efficacy, the better the predictor of their actions and the feelings of a high level of success. Consequently, the greater the motivation and resilience to face challenges, the more positive the individual's attitude (Sardegna, Lee, & Kusey, 2018). Zimmerman et al. (2019) specifically highlight self-efficacy in the educational context, noting that students with high self-efficacy are confident in understanding lessons, willing to solve educational problems, and tend to select more difficult courses. However, when students find that the situation exceeds their coping skills, they do not believe they can overcome the issue and tend to avoid such threatening situations or are not eager to carry out the activities due to perceived failure and fear of not producing the expected outcome. This is also known as response-outcome expectancies (Bandura, 1977, Zimmerman, Bandura, & Poons, 1992, Pintrich & Schunk, 2002).

Odewole (2023) highlights the importance of academic libraries to the academic achievement of students but notes that they are only useful to those students with information skills, who know how to access relevant resources that meet their information needs. With a supportive academic environment and strong information skills, students' feelings and attitudes can shift from unfavorable to favorable, leading to competence in conducting research and higher confidence in academic tasks. As a result, students are more likely to have a positive attitude toward learning (Odewole, 2023). Many researchers have proven that communication skills are essential for individuals not only in their academic journey but throughout every stage of life. When students can communicate effectively, articulate their thoughts clearly, and receive, understand, retain, and apply constructive feedback, they become more confident in class discussions. This sense of enhanced self-efficacy from assurance in interpersonal interactions helps them achieve educational goals, thereby fostering a more positive attitude towards participation. This conclusion is further supported by Toomnan & Intaraprasert (2015), whose research found that individuals with trained oral communication skills displayed higher self-efficacy than those who did not. Dörnyei (1995) also found that students who effectively use communication strategies and techniques tend to have positive attitudes toward learning (Toomnan & Intaraprasert, 2015, Dornyei, 1995)

Mukhopadhyay (2013) highlighted that physics, a branch of science involving numerous concepts and practice questions, requires more than just memorization. Instead, students must think creatively to solve problems during observation and experimentation to achieve satisfactory results. When it comes to tracking task completion, students with creative potential, who can contribute solutions and ideas to solve complex and poorly defined problems, can experience satisfaction and pride from successfully creating new and valuable contributions. This leads to a positive attitude towards taking on new challenges (Julianto, et al., 2022, Mukhopadhyay, 2013)

Delich & Roberts (2017) found that enactive mastery experiences, which refer to individuals who have

successfully practiced a skill, are crucial as individuals reach a self-supporting level. Applying self-efficacy theory, we suggest that when students are equipped with three primary skills (information, communication, and creation), it can enhance self-efficacy from personal mastery experiences, granting emotional and physiological states of satisfaction. In turn, this empowers students throughout their educational journey, leading to a positive attitude towards learning. However, without effective coping skills, individuals may deem the situation insurmountable, regardless of their efforts or persistence, leading to no obvious incentives, lack of initiation and persistence, and a negative attitude towards the learning process (Erdem, 2015). This is further proven in the study by Baldwin et al. (1999), which found that prior knowledge and experience can shape the learning process and affect students' attitudes. Therefore, we propose the following hypotheses: (Baldwin, Ebert-May, & Burns, 1999, Delich & Roberts, 2017).

H1: Information skills positively affect student attitudes towards learning
H2: Communication skills positively affect student attitudes toward learning
H3: Creation skills positively affect student attitudes toward learning

Skills, Attitude and Student Engagement: Researchers highlight that a positive attitude leads to a desire to participate and engage in the learning process. (Marton & Saljo, 1997). The motivation for engagement is based on perceived ability, where "ability" refers to the mastery level of the three primary skills: information, communication, and creation (Dweck, 1986). This idea is supported by two key theories: Self-Determination Theory (SDT) and Social Cognitive Theory (SCT). Self-determination theory (SDT) explains that attitudes need to fulfill basic psychological needs – autonomy, competence, and relatedness – to develop positive attitudes that can lead to higher engagement (Reeve, 2012). Guay (2021) found that students equipped with skills are more likely to engage in class. In this study, skills refer to (1) mastering information skills boosts students' confidence, driving positive attitudes and intrinsic motivation towards the learning process, making them more likely to actively participate in studies, engage in discussions, and complete assignments; (2) students equipped with effective communication skills can express their thoughts clearly and feel valued and understood, thereby enhancing their attitude towards collaborative learning. (Grenier, Gagné, & O'Neill, 2024). This improvement in attitude leads to increased participation in class, effective teamwork, and deeper engagement with learning materials; (3) students are more engaged when encouraged to be creative, as this empowerment allows them to explore and innovate, fostering more positive and proactive attitudes towards learning. The development of information, communication, and creation skills fulfills the psychological need for competence, positively affecting student attitudes and intrinsic motivation, and leading to higher levels of engagement (Legault, 2017, Guay, 2021)

Social Cognitive Theory (SCT) explains that engagement requires individuals to have positive beliefs and self-efficacy to execute actions (Bandura, Social Cognitive Theory, 1989). Self-efficacy, which refers to students' beliefs about their abilities and skills, drives student attitudes and is a key predictor of academic achievement and engagement (Haw, Sharif, & Han, 2022). According to this theory, whether students engage in class depends on their positive attitudes, which are influenced by their perception of their capabilities, competence, and confidence in mastering tasks (Jenkins, Hall, & Raeside, 2018). When students believe they can successfully find and apply information (information skills), effectively communicate ideas (communication skills), and see the impact of their actions in tackling complex problems creatively (creation skills), their self-efficacy increases (Govindaraju, 2021). This enhanced self-efficacy strengthens their belief in their capabilities, leading to a greater willingness to engage in learning activities, participate in class, and persist through challenges (Ponton & Rhea, 2006). Student engagement comprises three dimensions: behavioral engagement (attending classes, participating actively, and completing assignments on time), emotional engagement (increased interest, enjoyment, and enthusiasm in educational activities), and cognitive engagement (investing in deeper learning strategies, problem-solving, and critical thinking) (Ryan & Deci, 2000). Both SCT and SDT highlight how the development of information, communication, and creation skills shapes and enhances students' positive attitudes, particularly by instilling a sense of competence and high self-efficacy. This, in turn, influences the level of student engagement in class. Therefore, we propose the following hypothesis:

H4: Student attitudes mediate the relationship between information skills and student engagement
H5: Student attitudes mediate the relationship between communication skills and student engagement
H6: Student attitudes mediate the relationship between creation skills and student engagement

Research Model

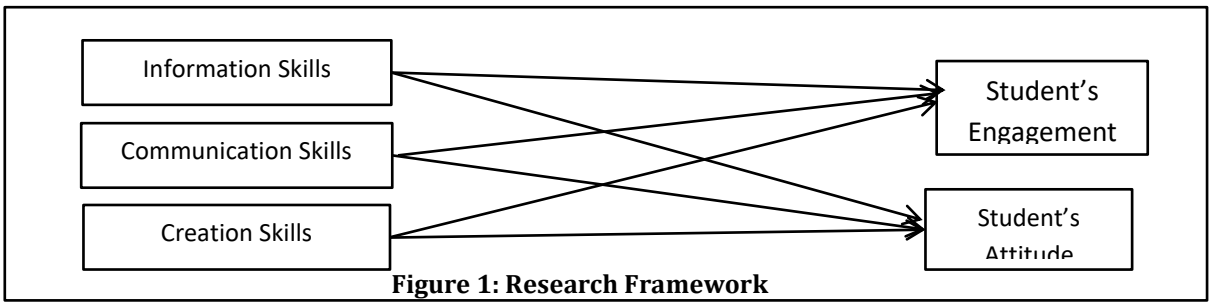


Figure 1: Research Framework

Figure 1 connects the variables as follows: The independent variables, which are the causes or influencing factors in this study, refer to the three primary skills (information skills, communication skills, and creation skills). The dependent variable, which is the effect or outcome influenced by independent variables, is student engagement. The mediator, or mediating variable, in this case, refers to an attitude, which acts as a bridging gap explaining how and why the effect occurs.

3. Research Methodology

The study population focuses on university students, specifically targeting local Malaysian students who are currently in semester 4. By using purposive sampling, this study set three criteria which are full-time or Part-time students, second in semesters 4 and 5, and local universities located only in Klang Valley. Data is collected quantitatively by distributing a structured online survey to 323 undergraduate students. The questionnaire includes 8 questions for demographic information, 13 questions related to the information skills variable, 5 questions for communication skills, 3 questions for creation skills, 4 questions on student attitude towards learning, and 5 questions on student engagement. All items adapted from Peart et al. (2020) and used a 5-point Likert scale. Hy skills. Smart-PLS and SPSS programs will be used to conduct the data analysis. The SPSS program will cover Preliminary Analysis and Descriptive Analysis to provide information about the selected sample group. Meanwhile, the Smart-PLS program will focus on the Structural Equation Model (Convergent Validity, Discriminant Validity – HTMT, Factor Loading), Structural Model (Direct and Indirect Effect), and Mediation Analysis to analyze the relationship between the three primary skills (information, communication, creation) and student engagement, mediated by attitude.

4. Results

The analysis is carried out based on the conceptual framework generated by the Smart-PLS program, as shown in The path model illustrates the relationship between the three primary skills (information, communication, and creation), attitude, and student engagement.

Profile of Respondents: Table 2 explains the frequency tables that provide a basic understanding of the demographics of the respondents. It summarizes that the majority of respondents are:

Table 2: Demographic and Geographic Information About Student Engagement

Demographics Factors	Frequency	Percentage
GENDER		
Males	75	76.8%
Females	1248	23.2%
Total	**323**	**100%**
AGE		
20-25	322	99.7%
26-30	1	.3%
Total	**323**	**100%**
CURRENTLY, I AM…		
Full time	321	99.4%
Part-time	2	.6%

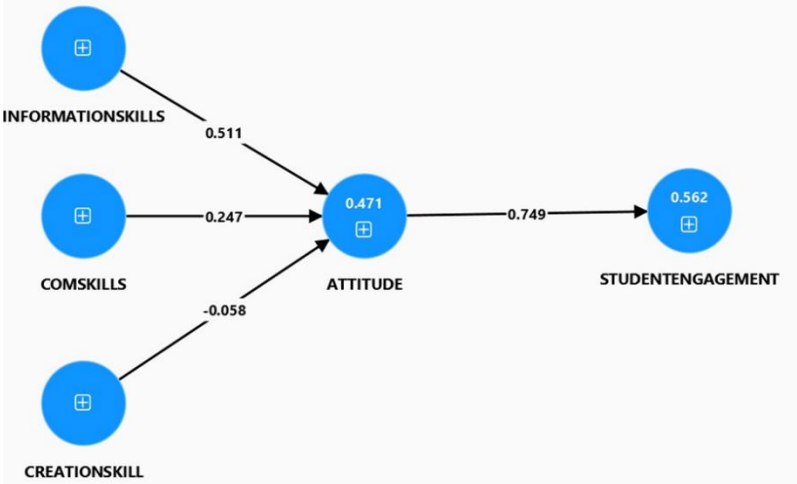
Total	**323**	**100%**
CURRENTLY, I AM…		
<6months	14	4.3%
PT jobs	25	7.7%
Not work	284	87.9%
Total	**323**	**100%**
WORKING EXPERIENCE		
<6months	220	68.1%
1-2	82	25.4%
2-3	19	5.9%
>5	2	.6%
Total	**323**	**100%**
IN MY STUDY, I HAVE BEEN EXPOSED TO THE DIGITAL SKILLS		
Yes	310	96.0%
No	13	4.0%
Total	**323**	**100%**

Descriptive Statistic: Table 3 provides information on basic statistical measures as a summary of the answers in the 5-point Likert scale questionnaire for each variable.

Table 3: Descriptive Statistics

Variable	Mean	Std. Dev.	Explanation
Information Skill	3.9159	0.65979	On average, students rated their information skills at 3.9159 on a certain scale. The variation around this mean score is relatively moderate, with a standard deviation of 0.65979, indicating that most students' ratings are fairly close to the mean.
Communication Skills	3.9505	0.73376	The average rating for communication skills is 3.9505. The standard deviation of 0.73376 suggests a moderate spread of ratings around the mean, implying a moderate level of consensus among students about their communication skills.
Creation Skills	3.8163	0.72705	Students rated their creation skills at an average of 3.8163. The standard deviation is 0.72705, indicating a moderate level of variability in how students perceive their creation skills.
Attitude	4.0689	0.70800	The mean score for student attitude is 4.0689, indicating generally positive attitudes among the students. The standard deviation of 0.70800 shows a moderate variation around the mean, suggesting some diversity in student attitudes.
Student Engagement	3.9022	0.67564	The average rating for student engagement is 3.9022, with a standard deviation of 0.67564, suggesting that most students' engagement levels are close to the mean, with some variation.

Figure 2: Conceptual Framework



Factor Loading: Figure 3 visualizes the path model, illustrating the strengths of relationships by quantifying them with path coefficients for different constructs, thereby assisting in better understanding these relationships. The outer loadings measure how well each survey question relates to the construct, indicating the level of accuracy for the indicator in representing the concept being measured. Results from Table 4 represent a high outer loading, suggesting that the data collected is an effective measurement tool. According to the results, it can be seen that all four indicators for attitude are above 0.89, indicating that every set of questions well represents the respective construct of attitude. Similarly, the five indicators of communication skills have loadings where the lowest is 0.882, which is well above 0.7. Creation skills, with three questions, have the highest average, with the lowest at 0.932, nearly reaching 1, indicating a strong correlation to the respective construct. However, among the 13 indicators for information skills, one is highlighted in red with a score of 0.684 (INFORMATIONSKILLS1), which is below 0.7 but the value marginally accepted for this study. Lastly, all five indicators for student engagement, with at least 0.892, indicate strong reliability in measuring student engagement.

Table 4: Outer Loading

Indicators	Attitude	Communication Skills	Creation Skills	Information Skills	Student Engagement
ATTITUDE1	0.924				
ATTITUDE2	0.934				
ATTITUDE3	0.923				
ATTITUDE4	0.895				
COMSKILLS1		0.900			
COMSKILLS2		0.934			
COMSKILLS3		0.914			
COMSKILLS4		0.919			
COMSKILLS5		0.882			
CREATIONSKILL1			0.932		
CREATIONSKILL2			0.939		
CREATIONSKILL3			0.948		
INFORMATIONSKILLS1				0.684	
INFORMATIONSKILLS2				0.787	
INFORMATIONSKILLS3				0.829	
INFORMATIONSKILLS4				0.814	
INFORMATIONSKILLS5				0.823	
INFORMATIONSKILLS6				0.803	
INFORMATIONSKILLS7				0.858	
INFORMATIONSKILLS8				0.908	

INFORMATIONSKILLS9	0.879	
INFORMATIONSKILLS10	0.875	
INFORMATIONSKILLS11	0.915	
INFORMATIONSKILLS12	0.905	
INFORMATIONSKILLS13	0.800	
STUDENTENGAGEMENT1		0.900
STUDENTENGAGEMENT2		0.937
STUDENTENGAGEMENT3		0.956
STUDENTENGAGEMENT4		0.893
STUDENTENGAGEMENT5		0.892

Convergent Validity: This concept is assessed using: Cronbach's Alpha, which measures internal consistency, with values above 0.7 considered acceptable, above 0.8 considered good, and above 0.9 considered excellent; Composite Reliability, which reflects overall reliability, with values above 0.7 representing an acceptable level of reliability; and Average Variance Extracted (AVE), which measures how well the concept is related to each other, with values above 0.5 indicating a trustworthy construct. The purpose of convergent validity is to ensure measurement accuracy and enhance the credibility of this study, with results shown in Table 5. Overall, the results show that the constructs have high levels of reliability and validity. In short, each item in the questionnaire consistently measures the concepts related to the variables –information skills, communication skills, creation skills, attitude, and student engagement – and these constructs are clearly defined and meaningful to the context of this research.

Table 5: Convergent Validity

Variable	Composite Reliability (rho_c)	Average Variance Extracted (AVE)
Attitude	0.956	0.845
Communication Skills	0.960	0.828
Creation Skills	0.958	0.883
Information Skills	0.969	0.704
Student Engagement	0.963	0.839

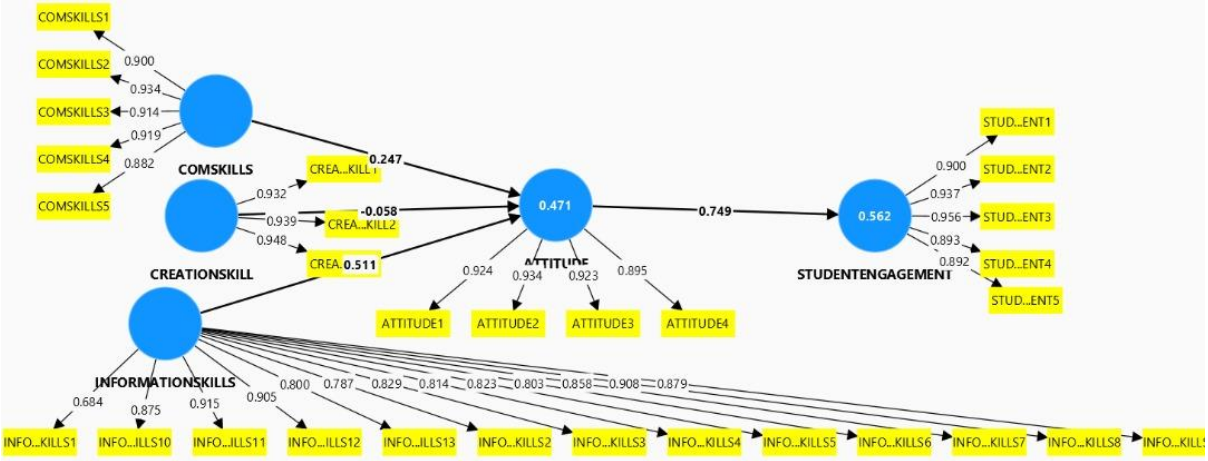
Discriminant Validity: The result shows the Heterotrait-Monotrait Ratio (HTMT), which calculates the average correlation between different constructs (heterotrait) and the same construct (monotrait). This aims to support the theoretical framework by ensuring that each construct has a unique aspect in this study. An HTMT value less than 0.85 indicates that the constructs are distinct, a value between 0.85 and 0.90 suggests some overlap that requires further review and refinement, and a value greater than 0.90 indicates a problem with discriminant validity, as the constructs are overly correlated. The interpretation of these results is illustrated in Table 6. Overall, the correlations for most of the interrelationships are distinct from each other constructs. Overall of the discriminant issues explained there was no issue of discriminant validity of this model.

Table 6: Discriminant Validity

Variable	Attitude	Communication Skills	Creation Skills	Information Skills
Attitude				
Communication Skills	0.668			
Creation Skills	0.577	0.803		
Information Skills	0.708	0.890	0.813	
Student Engagement	0.789	0.756	0.732	0.778

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Figure 3: Path Model



Structural Model: The result of the path coefficient for the direct effect is explained by the p-value, which represents the probability of the observed path coefficient. Values less than 0.05 indicate statistical significance, meaning the model is significant at the 5% significance level. The numbers are calculated by the Smart-PLS in hypothesis testing and model validation by quantifying the relationship and providing the strength and direction based on the values. As can be seen in the results, of 2 out of 4 hypothesis testing, the result in Table 7 represents significant relationships. The relationship between communication skills and attitude shows a positive p-value ($\beta = 0.247$, $p>0.05$), but since it is higher than 0.05, it suggests uncertainty regarding the impact of communication skills on driving student attitude towards learning. Next, the relationship between creation skills and attitude ($\beta = -0.058$, $p>0.05$), has a p-value far above 0.05, indicating a statistically non-significant relationship, meaning there is no meaningful impact between the two variables. The significant relationships are between attitude and student engagement ($\beta = 0.749$, $p>0.05$), which shows that attitude plays an important role in determining the level of student engagement, and between information skills and attitude, highlighting the importance of information skills in shaping student attitudes.

Table 7: Structural Model

Variable	Beta Value	SE	T- Value	P-Values	Results
Information Skills -> Attitude	0.511	0.123	4.165	0.000	H1: Supported
Communication Skills -> Attitude	0.247	0.142	1.740	0.082	H2:Not Supported
Creation Skills -> Attitude	-0.058	0.127	0.456	0.648	H3: Not Supported
Attitude -> Student Engagement	0.749	0.051	14.702	0.000	H4: Supported

Mediation Analysis: Similar to the structural model that explains the direct effect, mediation analysis explains the indirect effect of path coefficients. The most important element is the p-value result; obtaining a p-value less than 0.05 represents a significant relationship. Conducting the analysis helps to clarify the relationship and provides a different perspective on relationship development and testing. Since the earlier direct effect showed no significant relationship between communication skills and creation skills towards the mediator of student attitude, the results of the indirect effect similarly indicate that among the three primary skills, communication skills with a p-value of 0.090 and creation skills with a p-value of 0.648 are not statistically significant. Only information skills are statistically significant, with a p-value of 0.00. In short, students with information skills tend to have a positive attitude toward learning, leading to a high level of engagement in class.

Table 8: Mediation Analysis

Variable	Beta Value	SE	T Statistic	P Values	Results
Communication Skills -> Attitude -> Student Engagement	0.185	0.109	1.694	0.090	H5: Not Supported
Creation Skills -> Attitude -> Student Engagement	-0.044	0.095	0.457	0.648	H6: Not Supported
Information Skills -> Attitude -> Student Engagement	0.383	0.094	4.081	0.000	H7: Supported

Discussion

Table 8 shows a summary of the analysis. Among the three primary skills, information skills are the only ones with a significant impact, as indicated by a p-value less than the 0.05 threshold. This suggests that the data from the questionnaire provide sufficient evidence to support that students equipped with information skills – specifically, the ability to identify important and needed content from an information pool – are more likely to have a positive attitude towards the learning process, resulting in a p-value of 0.00. Moreover, the indirect relationship, with a p-value of 0.00, further supports that students with information skills are more likely to have a positive attitude, which enhances their willingness to participate and engage in class. However, the coefficient for the direct effect of communication skills falls between 0.05 and 0.10, meaning it does not meet the 5% significance level. Therefore, the evidence is not strong enough to conclude that communication skills affect student attitudes toward learning. Similarly, the indirect effect of communication skills, with a p-value of 0.090, also does not reach the level of significance required for a strong conclusion. Lastly, the direct effect for creation skills has a p-value of 0.648, which is well above the 0.05 threshold. This suggests that more research is needed to link creativity to its impact on students' perceptions and behaviors toward learning experiences. The indirect effect of creation skills shows the same p-value of 0.648, indicating that it also requires further investigation to establish a significant connection.

Limitations

Although multiple theories support the formulation of the six hypotheses, the data analysis shows different results except for information skills. This discrepancy is due to the limitations of the study: poor definition, sampling bias, and sample size (Theofanidis & Fountouki, 2018). The poor definition can be evidenced in the discriminant validity, where no distinct aspect is found in the relationship between communication skills and creation skills, with a correlation as high as 0.903. This leads to a poor construct where both variables were not assessed comprehensively, affecting hypothesis testing by inflating or deflating the path coefficients, and causing possible errors in determining and interpreting the strengths and direction of the relationships, resulting in incorrect conclusions due to distorted relationships.

Sampling bias occurs when the results are not generalizable, as seen in the frequency table where respondents are primarily students currently in their fourth semester, mainly aged 20-25, nearly 90% not working and pursuing full-time study, and the questionnaire only targeting local students. With a sample lacking diversity, the study becomes inapplicable to other populations that are neglected, such as part-time students, older students, international students, and those in different academic stages. Different groups of students have different experiences and perceptions towards the three primary skills, attitude, and student engagement. In short, the biased result assumes that all students share the same characteristics and points of view regarding the importance of the three primary skills due to the homogeneity of the chosen sample size. (Chen, Keglovits, Devine, & Stark, 2022). Sample size refers to the number of participants, which in this study is only 323, with no more than 100 responses accepted by the SmartPLS program. This leads to inaccuracies in the results and increases the difficulty of detecting significant relationships, resulting in a possible Type II error, or failing to detect a true effect. The larger the sample size, the more reliable the result (Andringa & Godfroid, 2020).

5. Managerial Implications and Recommendations

The purpose of this study is to provide insights to policymakers for designing the upcoming Malaysia Education Blueprint for the years 2026 to 2036, serving as guidelines for the entire educational system. In the literature review, this study covers other researchers' results and conclusions, supported by theories to hypothesize the proposed relationships. Self-efficacy theory explains the strong connection between skills and attitude.

However, the results of the data analysis suggest an insignificant relationship, especially for communication and creation skills towards attitude, which contradicts the earlier assumption. This may be due to the limitations of the study. In short, the data analysis in this study only supports the direct effect between information skills and attitude.

For the indirect effects, where attitude mediates the relationship between skills and engagement, the literature review of this study is supported by two theories: Self-Determination Theory (SDT) and Social Cognitive Theory (SCT). Based on the strong relationship observed in studies by other researchers, the hypothesis of the indirect effect was assumed. However, the data output rejected this measure, except for the relationship where information skills drive student attitude and lead to student engagement. This is potentially due to limitations such as a small sample size, sampling bias, or poor definitions.

From the proven result that information skills can drive a positive attitude in the learning process, resulting in a high level of student engagement, it is suggested to the Ministry of Education that the blueprint focus on offering Digital Literacy Programs. According to the preliminary analysis, nearly all respondents have been exposed to digital skills, representing a basic understanding of the effective use of technology to access information. (Putra & Rullyanti, 2023). The next step is teaching how to analyze the information. However, this requires the Ministry of Education to address the root cause by offering professional development programs, including training with supportive resources for educators to deliver knowledge and assist students in acquiring information skills. (Mopara & Sanrattana, 2023).

By implementing the recommendations suggested in the blueprint, it is foreseeable that students will have well-practiced information skills, driving positive behavior in the learning process, thereby leading to a high level of engagement in the classroom shortly. This can ultimately improve the educational system and elevate the average qualifications of Malaysians.

Based on the conclusion and the importance of carrying out educational research that helps the Ministry of Education design specific solutions for improving Malaysia's education outcomes, future research areas are suggested to make a cross-cultural comparison, examining whether different cultures can influence the relationship between skills and student engagement mediated by student attitudes. As the theories applied in this study are mainly developed in a Western context and have shown significant relationships in that particular educational setting, it is important to consider whether, without the limitations of this study, the results would still be different in a non-Western context.

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Public Perception Towards Insurance Companies in Malaysia

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Abstract: Nowadays, the insurance sector is regulated and driven by profit maximization, just like other providers of financial services. We have been taught that insurance is essential for peace of mind, yet customers generally have a poor perception of insurance providers, and this view is even more evident among younger clients who are so important to the industry's future. The objective of this study is to investigate factors that influence public perception of insurance companies in Malaysia, including fraud, claim settlement, and knowledge. The study adopted a cross-sectional survey research design. This survey was conducted using questionnaires and 110 randomly selected insurance policyholders. The study's findings suggest that the public's perception of insurance companies is significantly influenced by knowledge. As a result, this outcome will assist insurance companies in developing new formulas that take the criteria mentioned above into account to serve the public interest.

Keywords: *Public Perception, Fraud, Claim Settlement, Knowledge.*

1. Introduction and Background

Over the last few decades, Malaysia's insurance business has grown steadily, owing to increased knowledge of insurance products, rising disposable income, and an expanding middle class. From the physical effects of climate change to the subtle shifts in demography and consumer and public needs, proactive evaluation of emerging risks and trends is not only a strategic decision but a requirement for being relevant in a changing world. Insurance services can be defined as a product in the form of a written legal contract. Insurance services are complex, and future contingent services will involve substantial legal characteristics. It is proven that insurance services are different from other services (Kandil et al., 2024). According to *Malaysian Insurance Highlights 2024.* (2024), insurers will not only proactively assess climate risk to develop policies that respond to consequences but also build resilience. By integrating climate models and projections into risk assessments, insurers can tailor products that not only protect their customers but also contribute to the broader societal goal of sustainability.

As stated by Global data (2022), the Malaysian insurance industry is projected to grow at a compound annual growth rate (CAGR) of 8.4% from RM73.1 billion in 2021 to RM109.6 billion in 2026, in terms of written premium, led by the life insurance and pension segment. In addition, they also highlight that Malaysia's insurance industry grew by 7.6% in 2021 after declining by 2.8% in 2020 due to the COVID-19 pandemic-induced economic slowdown. The background of the study highlights the issue of public perceptions towards insurance companies in Malaysia, as well as the independent variables, which are fraud, claims settlement, and knowledge of insurance.

Problem Statement: The purpose of this study is to determine the negative perception issues towards insurance companies that exist among the public in Malaysia. The study examines the public perception of insurance due to fraud incidents involving insurance companies, the majority of which involve unlicensed insurers in Malaysia. Some people refuse to buy insurance as they have low trust in insurance companies and agents (Kristabel et al., 2024; van der Cruijsen et al., 2023). Inexperienced consumers are afraid because they might misunderstand the insurance contracts, which may result if they accept the contracts, leading to fraud issues(Tennyson, 2002). Insurance fraud in Malaysia is rampant, and it takes insurers' costs up to one billion ringgit per year (Paultan, 2021). It also reported that 62% of Malaysians are willing to commit fraud to file an insurance claim(Asian Insurance Review, 2023). Thus, it reduces the perception that insurance companies exist because of the risks of fraudulent claims made by the insured to the insurer. Customers evaluate the actual

performance of insurance firms when their claims are settled rather than just during the initial policy sale and payment of claim letters. It is considered the primary service that insurance businesses provide to the community (Dick & Basu, 1994). Once the insurance companies failed to provide claim settlement timely and ethically, people started to inquire about the insurer's capability in claim settlement (Basaula, 2018).

The objective of this research is to examine the relationship between fraud, claims settlement and knowledge of insurance with the public perception towards insurance companies in Malaysia. The significance of this study is to address the public's ongoing mistrust of insurance firms, which may cause individuals to decide against getting any insurance at all. Additionally, the study can assist individuals in shifting their perspective on the insurance industry. Other than that, the insurance firms themselves ought to step up their efforts to inform customers about the value of insurance and enable them to discern between unlicensed and licensed providers.

In addition, the general public should be able to comprehend the reasons insurance companies postpone paying an insured's claim, as there are several causes for this delay. One of the reasons is that insurance companies must first have sufficient evidence before proceeding with claim settlement. To get sufficient evidence, the insurer must conduct a comprehensive investigation and look into the insured's profile, background, claims history, and many other details. This study contributes to a better public knowledge of the causes of problems like delayed claims.

Lastly, insurance companies can benefit from this study. They possess the ability to discern the unfavorable opinions held by others towards them. Based on this knowledge, they can take steps to improve their reputation. To enhance consumer confidence in insurance purchases, companies can provide comprehensive information about their operations and offer products that are suitable and competitively priced for the broader population.

2. Literature Review

Public Perception Towards Insurance Companies in Malaysia: Perception can be defined as the process by which an individual receives, selects, organizes, and interprets information to create a meaningful picture of the world. Hence, individuals act and react based on their perceptions, not based on objective reality (Durmaz-Drinkwater et al., 2020). Perceptions have almost similar meanings with attitude. Attitude can be defined as an individual or a group of people behaving toward a given object, whether favorably or unfavorably (Schiffman et al., 2013). Kotler et al. (2018) Claimed that people have attitudes towards everything. The main function of insurance is to act as a risk transfer mechanism to protect against losses (Edward et al., 2014). An insurance company is an organization that conducts insurance business, whereas a negative perception is a bad view of something. This sector offers a diverse range of insurance products, primarily divided into life insurance and general insurance.

Life Insurance: According to Globaldata (2022), the life insurance and pension segment accounted for 75.8% of written premiums in 2021 and it is expected to grow at a CAGR of 9.5% during 2021-26. Life insurance is a form of risk management for all individuals as it protects against unforeseen events that may put an individual's life in danger. It is an agreement between the insured and insurer in the form of insurance manifested so that the insurer will compensate for financial losses suffered by the insured in return for money called a premium (Edward et al., 2014). A life insurance policy in Malaysia is most appropriate for individuals who have financial dependents. Thus, it is not required for children or retirees who are no longer generating income or have financial dependents. The primary objective of life insurance is to safeguard the insured's dependents and close ones financially in the case of their untimely death. The dependents may afford to make a decision that best maintains their quality of life when they are sufficiently insured. The death benefit can help replace lost income and cover outstanding debts, mortgage payments, and daily living expenses, ensuring that the insured's dependents' financial well-being is safeguarded. Tax exemptions are available in Malaysia for life insurance premiums, offering a significant chance to save taxes. The total tax burden might be lowered by claiming the life insurance premiums you pay as tax relief. Life insurance helps to reduce financial uncertainties for individuals in old age, provides for the next of kin financially and eases the burden on dependents when the individual meets with sudden death (Zain, 2015). Life insurance was developed in response to the tendency of everyone to provide for their security and that of those dear to them in the event of loss due to death or

disability (Dass, 2014). There are several varieties of life insurance available to satisfy a wide range of customer requirements and preferences. The decision of whether to choose temporary or permanent life insurance will be heavily influenced by the short or long-term demands of the insured individual or their family members. For as long as the policy is in effect, life insurance pays out, also known as a benefit to the insured or dependents in the event of the insured's death or total and permanent disability (TPD). There are two types of life insurance policies: whole life insurance and term life insurance. Thus, the word "during the policy period" is crucial. Term life insurance typically provides coverage for a specific period, such as 10, 20, or 30 years. The Insured's dependents will profit if the insured passes away or gets TPD during this time; otherwise, the insured and the dependents will not get anything. Conversely, whole life insurance provides lifetime coverage; however, the premium is substantially greater than that of term insurance.

However, some of the coverage is not available in life insurance. Hence, medical and health insurance is one of the options that can be considered for purchase by the insured. It helps to cover the cost of hospitalization and treatment or provide financial support if the Insured has an illness or an accident. In addition, medical and health insurance is a financial contribution plan that requires monthly or yearly payments (The Malaysian Insurance Institute, 2019). Malaysia has a public healthcare system, which allows people to receive free or low-cost medical care at government facilities. The healthcare system, however, works in tandem with private institutions. Without private medical insurance, Malaysians would have to pay significantly more for treatment in private facilities, where patients frequently receive a higher degree of care than in congested public hospitals. Hence, it is one of the reasons why medical insurance is widely used in the country.

General Insurance: General insurance comprises insurance for property against fire and burglary, floods, storms, earthquakes, and others. General insurance covers personal insurance, including insurance against accidents, health insurance and liability insurance. Besides that, it also covers errors and omissions, insurance for professionals, credit insurance, and a few more. The premium payment is in advance, which means that general insurance policies are annual (Nawi et al., 2011). According to Insurance Asia (2022), Malaysia's general insurance industry is projected to reach $5.5 billion in 2026, growing at a compound annual growth rate (CAGR) of 4.6%. In addition, the Malaysian general insurance industry's development will be aided by increased automotive sales as well as excellent performance in property insurance due to the country's expanding building activity. Malaysia registered almost 600,000 new passenger vehicles in 2022. The Road Transport Act of 1987 requires all vehicle owners to have proper motor insurance. Thus, it has caused the net premium value of automobile insurance to surpass eight billion Malaysian ringgit in 2022 (Siddharta, 2023). Even though there are many different kinds of motor insurance policies that cover everything from loss and damage to daily transportation expenses if the insured's vehicle is stolen or needs repairs, there are two primary categories depending on the scope of coverage which are comprehensive and third-party liability. The comprehensive policy basically will offer extensive coverage. In addition, it also assists in covering expenses resulting from loss or damage to the insured's car, as well as in covering third-party liability. Third-party liability is the most fundamental and popular kind of motor insurance. In essence, this coverage will pay for the damages if the insured's vehicle causes harm or loss to the third party. In other words, the motor insurance coverage will pay the third party back for any damages incurred if injured in an accident that results in damage to their vehicle. More significantly, according to the Road Transport Act 1987, all vehicle owners are required to purchase third-party insurance coverage (The Malaysian Insurance Institute, 2019).

Fraud: Fraud is defined as applying the methods of deception or any device that would culminate in an individual or group gaining advantages over others by making wrong suggestions or not telling the truth, which includes all surprises, tricks, cunning or dissembling, in any unfair way (Singh et al., 2024). Economists stated that fraud is a major threat to the economy because fraud can occur more during bad or unstable economic conditions within an organization or sometimes in the country (Gill, 2011). Insurance fraud can occur in many ways. There are many different stages of severity in insurance fraud, going from build-up to planned criminal fraud through opportunistic fraud. Usually, insurance fraud refers to the insured misreporting the magnitude of their losses or making a fake report on an accident that never occurred, but it can also exist when the insured does not disclose relevant information (Singh et al., 2024). Insurance fraud is caused not only by the insured but also by the insurance company. In terms of the healthcare insurance system, fraud is widespread and very costly as it involves intentional deception or misrepresentation intended to get an unauthorized benefit. It cannot be denied that health insurance fraud is increasing every year (Rawte & Anuradha, 2015). Insurance

fraud is considered one of the most significant challenges to the financial stability of the insurance market(Jung & Kim, 2021). In Malaysia, there is no official estimates have been calculated by any authorities or governmental bodies, although there have been many insurance fraud cases reported during the last few decades (Mohamed, 2013).

Insurance or takaful fraud can be defined as any deliberate deception or dishonesty committed against or by an insurance company or takaful operator, insurance or takaful agent or consumer for unauthorized financial gain. It can occur or may be committed by different parties, such as policyholders, third-party claimants, intermediaries and professionals who provide the services to claimants.(Mohamed, 2013). Olalekan Yusuf and Rasheed Babalola (2009)Claim that insurance fraud can be categorized into four categories: internal fraud, policyholder fraud, intermediary fraud, and insurer fraud. Based on this analysis, it is hypothesized that:
H1: There is a relationship between fraud and public perception towards insurance companies in Malaysia.

Claim settlement: Claim settlement is very important in the implementation of an insurance policy. The success of insurance companies largely depends on claim settlement. (Basaula, 2016, 2018). The regulators are very much concerned with the insurer's solvency position because the protection of the policyholders is of prime importance to the regulator, as well as the protection of investors and other stakeholders by ensuring that the insurer provides an accurate representation of their financial standing (Yadav & Mohania, 2013). The requirement for outstanding claim provision is due to the delay between the claim event date and the claim settlement date. This delay depends on how long it takes from the day a loss occurs until the claim is settled and paid out to the policyholders. Delays in claims are contributed to by the long-term cost of losses (Boadi et al., 2017). According to Basaula (2017), the insured has the right to receive the amount under the policy of the insurance contract as promised by an insurer, namely a claim. Claim settlement is a very important part of every insurance company. Claim settlement and customer service are the more important factors rather than other factors in insurance. (Edward et al., 2014). In the context of insurance, both service quality and product quality are critical determinants of customer satisfaction. Recent literature emphasizes how these dimensions influence consumer choices and perceptions, ultimately affecting their overall satisfaction with insurance products and services (Przybytniowski, 2023; Tjizumaue & Govender, 2019). Increasing the perception of service quality will also increase consumer awareness and satisfaction. Hence, delay in claim settlement will affect consumer satisfaction.

Yadav and Mohania (2013) stated that people buy a life insurance policy to cover any unfortunate events. However, insurance companies need to focus more during the claim settlement, not only at the time of purchasing policies. Insured expects to have a fair claim settlement process when needed. The likelihood of consumers purchasing insurance is significantly influenced by the presence of delays and bottlenecks in the purchasing process (Honka, 2014). The claim settlement process needs to be done as smoothly as possible so that at the time of need, the insured will not suffer due to the complexity of the claim settlement process. It is, therefore, hypothesized that:
H2: There is a relationship between claim settlement and public perception towards insurance companies in Malaysia.

Knowledge: Insurance is not a new concept, and most people are familiar with it. Insurance has not been available in rural areas because of low awareness among the rural population(Madhukumar et al., 2012). Rural people have less knowledge about insurance and claim that insurance should never be considered an option because they were assumed to be poor to save and pay premiums. Awareness and knowledge of the uses and importance of insurance are related to insurance consumption. It indicates that the higher the level of an individual awareness of a thing, the more likely a person will appreciate its value. Lack of awareness and knowledge are major problems related to insurance consumption (Honka, 2014). In the past, the insurance industry faced difficulties in surviving because insurance is a complex product and is hard to understand due to ignorance of insurance. However, this situation has changed, and insurance become necessary for consumers due to consumers become more educated and knowledgeable(Mamun et al., 2021). Despite that, there are still some people who have issues with insurance because of less education and knowledge. Mamun et al. (2021) also stated that other factors that contributed to the change of attitude are the problem of insolvent insurers and unfair trade practices. The insurance industry has been criticized for unfair and unreasonable delays in settlement claims, collusion and price fixing, poor service, incomplete and false information, and lack of

professionalism.

Knowledge of social group health differences is important in decision-making regarding health policies. Gwatkin (2000) Stated it is important to differentiate health status between rich and poor rather than the whole population due to differences in level of income and level of education. An educated individual will gain awareness of the product and processes, risks and opportunities as perceived by informed, describe a process by which an individual can receive and make the right decisions. (Muhammad Nasir et al., 2023; OECD, 2005). Hence, people who have less knowledge about insurance services will have heuristics in the course of their evaluation of the relevant offerings (Olalekan Yusuf & Rasheed Babalola, 2009). Therefore, education helps an individual to increase their awareness of financial fraud. Consequently, it is hypothesized that:
H3: There is a relationship between knowledge and public perception towards insurance companies in Malaysia.

3. Research Methodology

This article aims to focus on the quantitative research method, which includes descriptive and causal studies to conduct this research. The objective of a descriptive study is to obtain data that describes the topic of interest. It is designed to collect data that describes the characteristics of objects, events or situations.(Sekaran & Bougie, 2016). A descriptive study will explain more about the reason people have negative perceptions towards insurance companies. The factors proposed are fraud, claim settlement, and knowledge (independent variables), along with public perceptions towards insurance companies (dependent variable). Apart from that, correlational studies have also been applied to investigate the relationship between dependent variables and independent variables. The purpose is to investigate the relationship between public perceptions towards insurance companies in Malaysia (dependent variables) and independent variables (fraud, claim settlement and knowledge). A total of 110 questionnaires were obtained from randomly selected insurance policyholders.

4. Results

This section presents sets of results relating to the public perceptions towards insurance companies in Malaysia regarding fraud, claim settlement, and knowledge.

Profile of Respondents: Table 1 displays a summary of the characteristics of the total sample of respondents who participated in the study.

Table 1: Demographic and Geographic Information About Respondents (n=110)

VARIABLE	FREQUENCY	PERCENTAGE
Gender		
Male	58	52.7 %
Female	52	7.3 %
Race		
Malay	67	60.9 %
Chinese	21	19.1 %
India	16	14.5 %
Others	6	5.5 %
Age		
18 – 25 years	48	43.6 %
26 – 35 years	29	26.4 %
36 – 45 years	23	20.9 %
46 and above	10	9.1 %
Education level		
SPM	50	45.5 %
Diploma	25	22.7 %
Degree	30	27.3 %
Master and PhD	5	4.5 %

Marital status		
Single	56	50.9 %
Married	50	45.5 %
Divorce	4	3.6 %
Monthly income		
RM 1000 and below	23	20.9 %
RM 1001 to RM 2500	50	45.5 %
RM 2501 and above	37	33.6 %
Occupation		
Government	26	23.6 %
Private sector	49	44.5 %
Own business	35	31.8 %

Reliability Analysis: Reliability Analysis was used to determine the consistency of the variables as shown in Table 2 below.

Table 2: Reliability Analysis

VARIABLE	NO OF ITEM	Cronbach Alpha
Public perception towards insurance companies	10	0.912
Fraud	10	0.753
Claim settlement	10	0.676
Knowledge	10	0.749

Reliability Statistics: Reliability Statistics display the overall consistency of the variables as shown in Table 3 below.

Table 3: Reliability Statistics

CRONBACH'S ALPHA	NO OF ITEM
.841	40

Descriptive Statistics: Descriptive statistics for the perception of insurance policyholders towards the insurance companies were conducted, and Table 4 below displays the outcome.

Table 4: Descriptive Statistics

VARIABLE	MEAN	STD. DEV.
Public perception towards insurance companies	2.77	0.91
Fraud	2.65	0.74
Claim settlement	2.95	0.87
Knowledge	3.05	0.71

Based on the above table, the highest mean score was knowledge, followed by claim settlement, public perception towards insurance companies and fraud. This result indicates that the respondents had appropriate knowledge of the insurance that they purchased.

Table 5: Descriptive Statistics About Public Perception Towards Insurance Companies in Malaysia

ITEMS	MEAN	STD. DEV.	N
I believe in insurance companies.	2.83	1.14	110
Insurance companies are trustworthy.	2.85	1.284	110
I believe insurance companies fulfill promises promptly toward claim settlement.	2.74	1.27	110
I believe insurance companies understand customer needs.	2.63	1.23	110
I believe insurance companies are concerned about customer's problems.	2.55	1.18	110

The behavior of insurance companies enhances my confidence to purchase insurance coverage.	3.27	1.19	110
Insurance companies communicate well with their customers.	3.26	1.24	110
Insurance companies provide services at the time they promise to do so.	2.57	1.281	110
Insurance companies are always willing to help me.	2.56	1.18	110
An insurance company provides attention to each customer individually.	2.46	1.25	110

The highest mean, as shown in the above table, is item number 6, which is 3.27, whereas the lowest mean is item number 10. The highest range for standard deviation is item number 2, and the lowest range is item number 1.

Table 6: Descriptive Statistics About Public Perception Towards Fraud

ITEMS	MEAN	STD. DEV.	N
I understand insurance fraud very well.	3.02	1.39	110
I do not buy insurance coverage from insurance a company that operates far away from my living place.	2.39	1.44	110
There is always an increase in the cost of insurance without apparent reason.	2.95	1.44	110
Intermediaries (agents or brokers) often change their addresses.	2.26	1.11	110
There are many intermediaries (agents or brokers) who operate without a proper license.	2.70	1.31	110
Insurance companies should monitor closely their agent or brokers to determine if they are fit and proper.	2.87	1.48	110
I believe insurance companies have strategic plans to control fraud.	2.55	1.20	110
I always suspected fraud may occur before buying insurance coverage.	2.98	1.45	110
Insurance companies have taken fraud as a serious issue.	2.62	1.24	110
Insurance fraud has its pros and cons.	2.11	1.14	110

The highest mean, as shown in the above table, is item number 1, which is 3.02. The lowest mean reported is 2.11.

Table 7: Descriptive Statistics About Public Perception Towards Claim Settlement

ITEMS	MEAN	STD. DEV.	N
Better claim settlement could influence the insurance companies' profits.	2.79	1.49	110
The majority of insurance companies follow the proper claim settlement process.	2.83	1.31	110
The customer is aware of the claim settlement process.	3.08	1.42	110
Insurance companies should update regularly for better claim settlement process.	3.33	1.30	110
My decision to purchase insurance products depends on the claim settlement process.	2.85	1.43	110
I rate the quality of services based on claim settlement.	2.98	1.54	110
I believe delays in claim settlement are unnecessary.	3.25	1.56	110
There is always a dispute regarding the amount of the claim.	2.83	1.50	110
I take into consideration the claim settlement process before purchasing an insurance product.	3.06	3.27	110
The insurance company purposely delays the claim settlement.	2.46	1.37	110

As shown in Table 6, item number 4 has the highest mean, which is 3.33, whereas item number 10 has the lowest mean, which is 2.46. The highest range for standard deviation is item number 9, which is 3.27, and the lowest range is item number 4, which is 1.30.

Table 8: Descriptive Statistics About Public Perception Towards Knowledge

ITEMS	MEAN	STD. DEV.	N
I believe that insurance coverage is useful.	3.25	1.35	110
I believe that insurance coverage is necessary.	3.29	1.28	110
I believe buying insurance coverage is wasting of money.	2.79	1.23	110
I understand very well about insurance policy.	2.81	1.22	110
Having insurance coverage makes me feel protected.	2.98	1.26	110
Insurance companies should regularly collect information about customer needs.	3.23	1.15	110
Insurance companies should perform activities based on knowledge about customers.	2.95	1.24	110
My education level enables me to understand about insurance.	3.05	1.30	110
Insurance coverage is for those who have higher incomes.	2.97	1.40	110
Insurance coverage can ease the burden on family members	3.19	1.33	110

As shown in the above table, the highest mean is item number 2, which is 3.29, whereas the lowest mean is item number 3, whose value is 2.79. The highest range for standard deviation is item number 9, which is 1.40, and the lowest range is item number 6, which is 1.15.

Correlation Analysis: This analysis was used to determine the effect of one independent variable on the other dependent variables (fraud, claim settlement, and knowledge). The results are displayed in Tables 9, 10, and 11 below.

Table 9: The Relationship Between Public Perception Towards Insurance Companies in Malaysia and Fraud

		PUBLIC PERCEPTION TOWARDS INSURANCE COMPANIES IN MALAYSIA	FRAUD
Public perception towards insurance companies	Pearson Correlation	1	-.156**
	Sig. (2-tailed)		.104
	N	110	110
Fraud	Pearson Correlation	-.156**	1
	Sig. (2-tailed)	.104	
	N	110	10

**Correlation is significant at the 0.01 level (2-tailed)

The above table shows that the Pearson Correlation for the fraud variable is -0.156, which can be concluded as a weak correlation. It also can be concluded that there is a negative relationship between public perception of insurance companies in Malaysia and fraud. Furthermore, the sig. The value (p-value) of this variable is 0.104, which means there is no statistically significant relationship correlation between fraud and the public perception of insurance companies in Malaysia.

Table 10: The relationship between public perception towards insurance companies in Malaysia and claim settlement

		PUBLIC PERCEPTION TOWARDS INSURANCE COMPANIES IN MALAYSIA	CLAIM SETTLEMENT
Public perception towards insurance companies	Pearson Correlation	1	.002**
	Sig. (2-tailed)		.987
	N	110	110
Claim Settlement	Pearson Correlation	.002**	1
	Sig. (2-tailed)	.987	
	N	110	110

**Correlation is significant at the 0.01 level (2-tailed)

According to the table above, the Pearson correlation for the claim settlement variable is 0.002, which indicates a weak correlation. In addition, the table indicates a positive correlation between claim settlement and the public's perception of insurance companies in Malaysia. Furthermore, the sig. The value (p-value) of this variable, 0.987, indicates that the correlation is not significant. As a result, there is no significant correlation between claim settlement and public perception towards insurance companies in Malaysia.

Table 11: The Relationship Between Public Perception Towards Insurance Companies in Malaysia and Knowledge

		PUBLIC PERCEPTION TOWARDS INSURANCE COMPANIES IN MALAYSIA	KNOWLEDGE
Public perception towards insurance companies	Pearson Correlation	1	.699**
	Sig. (2-tailed)		.000
	N	110	110
Knowledge	Pearson Correlation	.699**	1
	Sig. (2-tailed)	.000	
	N	110	110

**Correlation is significant at the 0.01 level (2-tailed)

According to the table above, the knowledge variable has a Pearson correlation of 0.699, which is moderate. It also shows that there is a positive correlation between knowledge and public perception of insurance companies in Malaysia. It demonstrates that there is a statistically significant relationship between knowledge and the public's perception of insurance companies. Therefore, we can conclude that knowledge significantly influences public perceptions of insurance companies in Malaysia.

Discussion

Based on the result obtained from Table 1, a total of 52.7% and 47.3% of Males and Females, respectively, experienced insurance purchases differently. This result suggests that two segments can be formed to design marketing programs, thereby positioning the organizations in the minds of customers. Besides that, respondents between 18 – 25 years constituted the highest number of those purchasing insurance policies. Also, a total of 45.5% of the customers from the middle-class purchase insurance policies. As we can see, the majority of the respondents have insurance policies, and it consist of varieties of insurance policies. Consequently, insurance companies can target these groups as separate market segments to design customer experience programs, create effective advertising and marketing campaigns, and position the offerings of insurance products in the minds of customers.

The Cronbach Alpha indicates how well the items in a set are positively correlated to each other. The closer the Alpha to 1, the higher the internal consistency and reliability. Cronbach's Alpha, which is below 0.60, is considered poor. 0.61 to 0.70 can be considered moderate, 0.71 to 0.80 are good, 0.81 to 0.9 is considered very good, and Cronbach Alpha above 0.90 is considered excellent(Hair et al., 2022). Based on Table 2, public perception towards insurance companies is considered excellent since the Cronbach Alpha value is 0.912. Cronbach's Alpha for fraud is 0.753, which is considered good, and for knowledge, which is the value of 0.749. Claim settlement is considered moderate due to its Cronbach Alpha of 0.676.

Based on the result of Table 3, the value of Cronbach Alpha tested for the overall study is 0.841, which means the result is considered very good. It proves that the questions are reliable and suitable for use in this research.

According to Table 6, the highest mean value is 3.02, which represents question number 1, which is 'I understand insurance fraud very well'. It can be concluded that the public knows very well about how insurance fraud occurs and what kind of insurance fraud they might face. According to the research conducted by Salleh et al. (2018), the possibility for consumers to commit insurance claim fraud was present. Medical insurance is a particular type of insurance that requires insurance organizations to pay higher average expenses for claims. Consumers of medical insurance are knowledgeable of the advantages and benefits they could obtain from insurance organizations.

Apart from that, the findings in Table 7 show the highest value of the mean, 3.33, representing question number 4, which is 'Insurance companies should update regularly for better claim settlement process'. It can be concluded that insurance companies should keep informing their customer about how the process of claim settlement. It is believed that if insurance companies always update their consumer, it will improve the perceptions of the public about insurance companies. Claim settlement mechanisms should be strategically designed to imbibe mutually related ambiance between policyholders and insurers (Ajemunigbohun et al., 2022).

Based on the findings in Table 8, the highest value of the mean is 3.29, which represents question number, which is 'I believe that insurance coverage is necessary'. It can be concluded that the public understands the importance of having insurance policies for their benefit. It is justifiable to argue that easier-to-understand terminology would be more attractive for financially illiterate people to search for information related to life insurance products, which subsequently leads to a better understanding and better perception of these products (Sang, 2020).

5. Managerial Implications and Recommendations

In general, an insurance company's principal objective is to offer financial security and risk management to people, corporations, and organizations. The insurance industry is primarily built on risk management. All written policies are reviewed with various risks in mind, and actuarial analysis is undertaken to comprehend the statistical chance of specific outcomes better. Policyholder premiums or benefits are changed in response to differences between statistical facts and predictions. Besides that, combating fraud in the insurance business is a crucial concern that calls for a diversified strategy. Given the financial and reputational consequences of fraudulent activity, insurance firms must establish thorough monitoring techniques to protect the integrity of their operations. Effective monitoring not only assists in discovering and avoiding fraud but also develops a culture of openness and responsibility. As mentioned before, the public is aware of these fraud issues since they are afraid to face financial problems. Insurance companies should always monitor their employees, especially their agents, to avoid fraud from occurring or at least to reduce it. One of the strategies is to do regular audits and reviews, which have been an efficient technique to detect and prevent fraud. Insurance firms should perform regular and random audits of their agents' actions and claim processing. These audits should focus on evaluating transaction trends, ensuring compliance with corporate regulations, and detecting any irregularities or abnormalities. Companies that frequently monitor the activity of their workers and agents can detect fraudulent behavior early on and take remedial action before serious damage happens. Other than that, technology is becoming a critical component in the oversight of insurance agents. Customer relationship management (CRM) systems are crucial instruments that enable businesses to fully monitor customer information, sales activity, and agent interactions. CRM systems give managers real-time data and insights into the performance of their agents, allowing them to see patterns and areas in need of development. Specialized agent management software also tracks productivity, optimizes workflows, and streamlines monitoring procedures. Data analytics, which offers actionable insights from performance data, significantly improves monitoring capabilities. Insurance companies may utilize analytics to evaluate trends, anticipate possible problems, and make data-driven choices that will enhance agent performance.

Besides that, sustaining good standards among insurance agents necessitates ongoing training and professional growth. Agents are kept informed about changes in the industry, new goods, and best practices through regular training sessions. Through the use of skill evaluations, agents' knowledge and performance gaps may be found, enabling focused training to correct these gaps. In addition, insights about the conduct and performance of insurance agents can be gained from customer feedback. To evaluate the caliber of services rendered, insurance companies can get input via surveys, reviews, and face-to-face contact with clients. Agent professionalism and adherence to business standards can also be anonymously assessed using mystery shopping procedures, in which assessors assume the role of clients. Incentive schemes also can improve performance by connecting agents' goals with the company's objectives. Performance-based incentives reward agents who meet or exceed sales objectives, get high customer satisfaction scores and follow business standards. Recognition programs that highlight great achievements provide a good work atmosphere and encourage agents to maintain high standards. Apart from that, regular communication between management and agents is required for efficient monitoring. Scheduled meetings allow an opportunity to discuss performance, resolve problems, and provide

direction. Mentorship programs and specialized support teams are examples of support channels that aid agents in overcoming problems and improving their performance. Other than that, fraud detection is an important part of monitoring in the insurance sector. Companies should put in place fraud protection systems to watch for suspicious activity, such as strange transaction patterns or anomalies in customer information. It can be done through clear investigative processes for suspected fraud that will guarantee that any inconsistencies are addressed quickly and efficiently. By implementing these all-encompassing tactics, insurance companies can guarantee that their representatives maintain the greatest levels of professionalism and integrity while also making a beneficial contribution to the company's performance.

Based on the findings, knowledge can change people's perceptions. Thus, insurance companies should take this chance to expose insurance knowledge to the public. In the insurance market, a policyholder's comprehension of their insurance coverage is critical for making educated decisions, managing risks efficiently, and properly utilizing their policies. A knowledgeable policyholder is not only more likely to be happy with their insurance company but also less likely to face unanticipated issues or conflicts over their coverage. Implementing thorough onboarding and education programs is an important first step in enhancing policyholder awareness. When new policyholders enrol, insurance firms should offer them unambiguous information regarding their coverage, including an in-depth explanation of policy terms, coverage limitations, exclusions, and the claims procedure. Onboarding materials should be user-friendly, including visual aids and interactive components to explain complicated concepts. Regular training events or webinars can also be provided to keep policyholders informed about changes in coverage, new products, or industry trends.

Besides that, creating and disseminating instructional content may greatly boost policyholder knowledge. Insurance businesses should spend time creating materials like blogs, articles, videos, and infographics that address all facets of insurance. Understanding policy terminology, risk management, and navigating the claims process are examples of topics that may be covered. These materials may be disseminated via the company's website, social media platforms, and email campaigns, allowing policyholders to access and interact with useful information easily. This action might also attract people from rural areas to gain knowledge and awareness about insurance products. Effective communication is essential for ensuring that consumers completely understand their insurance policies. Insurance companies may improve their expertise by using data analytics to offer targeted communications that meet the particular wants and concerns of individual consumers. Tailored messages might include policy changes, reminders for significant dates, and tailored advice based on their profile.

Furthermore, regular check-ins with policyholders will allow insurance companies to examine their coverage, address any changes in their situation, and advise them on how to maximize their benefits. Personalized communication strengthens insurer-client relationships, generating improved understanding and satisfaction. Educating policyholders on risk management and preventative measures is another excellent way to improve understanding. Insurance firms can provide customers with risk assessment tools and services to assist them in identifying and managing possible hazards. Sharing practical suggestions and best practices for avoiding losses or damages, such as home maintenance advice or safety precautions, enables policyholders to take proactive measures to safeguard themselves and their possessions. This technique not only expands knowledge but also minimizes the chance of claims.

Providing strong customer service is critical for responding to policyholder inquiries and concerns. Insurance companies should have specialized support teams to help policyholders with questions about plans, claims, and coverage. Live chat, help desks, and phone support may all give rapid assistance and address difficulties quickly. Insurance companies may improve comprehension and fill knowledge gaps by ensuring policyholders have access to competent and prompt help. Effective customer service reinforces information offered via other channels and fosters confidence. Apart from that, regularly gathering input from policyholders on their understanding of insurance products can give significant insights into areas where extra education is required. Surveys, feedback forms, and direct communication can aid in identifying common questions or misconceptions. Using this input to constantly update training materials, communication techniques, and support services ensures that insurance companies are attentive to their consumers' demands. This iterative process refines techniques and increases overall efficacy. As policyholders get a greater understanding of their insurance products, they will be able to manage their coverage, negotiate the claims process, and take proactive

risk mitigation measures. Finally, improving policyholder understanding leads to higher customer satisfaction, fewer claim disputes, and more efficient and successful insurance companies.

Conclusion

The objective of this paper was to examine the public perception of insurance companies in Malaysia, which is shaped by a complex interplay of knowledge. This study gives theoretical implications in terms of insurance perceptions studies, where knowledge is one of the significant determinants of the perceptions of insurance companies in Malaysia. Then on the practical implication, the insurers first may use these findings to enhance their image, strengthen customer connections, and contribute to the industry's overall success. As Malaysia's insurance business grows, an emphasis on openness, innovation, and customer-centric procedures will be critical to improving public perception and long-term viability. A company's reputation is shaped by its activities and community participation, which impact public perception as well. Participating in corporate social responsibility projects and community events and supporting social issues may help a company's image as a responsible and caring corporation. Positive word-of-mouth and comments from delighted consumers contribute to a favorable perception. These safeguards will also allow insurance businesses to secure their operations, reputation, and policyholder trust and confidence. As trust is built and maintained, policyholders are more likely to feel safe and appreciated, resulting in a stronger, more resilient connection between insurers and their customers. Apart from that, the insurance companies may use this finding to engage the knowledge of the individuals in Malaysia such as cultivating it through more awareness campaigns, and educational fairs targeted to all age groups and in all states in Malaysia. This can be done by boosting collaborations among industrial key players, higher learning institutions, financial institutions and related government bodies to spread insurance education to individuals in Malaysia.

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The Relationship Between Employee Engagement, Physical Wellness, Work-Life Balance and Employee Well Being

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Abstract: Employees often face challenges in finding work environments that consistently promote their well-being, despite spending a significant portion of their lives at work. This research investigates how employee engagement, work-life balance, and physical wellness relate to employee well-being at Nabati Food Malaysia Sdn. Bhd. Using a quantitative approach, the study tested three hypotheses through a survey with 187 participants, utilizing convenient sampling and an online questionnaire. Data were analyzed with the SPSS version 24.0. The results showed significant relationships between all variables and employee well-being, with employee engagement having the most substantial impact. The study recognized its limitations and provided recommendations for future research. Overall, the findings offer valuable insights for Nabati Food Malaysia and the fast-moving consumer goods sector, emphasizing the importance of enhancing employee well-being to improve business operations and employee satisfaction.

Keywords: *Employee Engagement, Work-Life Balance, Physical Wellness, Employee well being*

1. Introduction and Background

In today's high-tech work environment, there is a growing focus on employee well-being due to the increasing challenges faced by employees in managing their mental health. Employee well-being encompasses both physical and mental health, which are essential for overall life satisfaction and productive performance. Various researchers, such as Bryson, Forth, and Stokes (2017), emphasize that well-being includes cognitive aspects and is crucial for work motivation and performance. A holistic approach to well-being integrates physical, cognitive, and spiritual dimensions, impacting both personal and professional success.

Well-being is not a new concept, but its application in the workplace is still evolving. Schulte and Vainio (2010) suggest that well-being includes the quality of one's work-life, workplace safety, and health, while Abu Bakar et al. (2015) highlight the influence of physical, cultural, ecological, and technological environments on well-being. Disabato et al. (2016) identified two key dimensions of well-being: hedonic (focused on positive emotions and life satisfaction) and eudaimonia (focused on personal growth and mental strength). These models differ in how they measure well-being.

In Malaysia, employee well-being is an emerging issue, but research on it remains limited. Malaysia's Well-being Report highlights the country's social and economic well-being but lacks a long-term strategy. According to Lee (2018), Malaysia needs its well-being index to assess mental, emotional, and physical health. Mental health problems are a growing concern, with 18,336 people in Malaysia identified as being in various stages of depression in 2017. Promoting mental health awareness is crucial for societal well-being.

Workplace conditions, such as working hours, environment, and design, significantly affect employee well-being. Wilson et al. (2010) argue that poor well-being negatively impacts productivity, while Su and Swanson (2019) suggest that poor well-being leads to lower physical and psychological health. Changes in the work environment, such as open-office layouts, can also impact employee well-being (Guest, 2017). Erdal (2021) emphasizes that workplace design, safety, and health standards directly influence well-being, making it essential for organizations to create positive work environments to improve productivity and quality of life.

Pronk (2014) argues that a healthy, resilient workforce is a valuable resource for achieving business success. However, defining and measuring well-being is challenging due to its dynamic nature and societal changes.

Martela and Pessi (2018) suggest that organizations need to recognize the evolving expectations of employees and respond to their changing needs.

The importance of employee well-being is increasingly recognized, particularly in countries like the United States, the United Kingdom, and Japan, where businesses prioritize well-being to achieve economic success. In contrast, developing countries, including Malaysia, still lag in addressing this issue. The COVID-19 pandemic has further exacerbated employee well-being concerns, with many workers experiencing stress, exhaustion, and difficulties maintaining work-life balance. The pandemic has highlighted the need for organizations to prioritize employee well-being to maintain productivity and engagement.

Poor work-life balance is linked to various psychological and medical problems, as noted by Ismail and Kam (2018). The inability to balance work and family life negatively impacts well-being and job satisfaction. Research suggests that work-life balance within an organization indirectly affects employee well-being. Additionally, physical wellness is essential for job satisfaction and performance. Organizations must create environments that promote physical and mental well-being to enhance employee satisfaction and productivity.

In summary, this study examines the relationship between employee engagement, work-life balance, physical wellness, and employee well-being in the workplace, emphasizing the significance of these factors for individual and organizational success.

2. Literature Review

Employee Well-being: This study adopts Pollard and Davidson's definition of employee well-being, emphasizing the effective implementation of physiological, intellectual, and socio-emotional functions across a lifespan. Employee well-being, often linked to work-life balance, includes job satisfaction and positively affects performance (Huang et al., 2016). Employees working in a positive environment show enhanced well-being and productivity. Sharma et al. (2016) highlight that employee well-being involves both physical and psychological elements, with cognitive symptoms such as anxiety, depression, and self-respect, and physical symptoms like aches, dizziness, and muscular issues. Poor well-being negatively impacts productivity and increases healthcare costs (Su & Swanson, 2019).

Employee well-being is also connected to hedonic experiences and cognitive happiness (Bryson et al., 2017). Work-life balance, physical health, and well-being are crucial areas for organizations to focus on. Emotional well-being influences significant workplace outcomes, and Su and Swanson (2019) emphasize that the work environment plays a key role in well-being. Leadership styles and the psychological work environment significantly affect employee well-being (Enwereuzor et al., 2020).

A healthy workforce is linked to higher productivity and lower turnover (Wright & Huang, 2012). Employee well-being fosters loyalty and reduces sick days, leading to improved job performance (Abd Elaziz et al., 2015). Well-being is associated with job satisfaction, living standards, and career opportunities, as well as individual factors like job-related stress and work-family balance (Lapierre & Allen, 2006; Schaufeli et al., 2008). Occupational factors like job demands also influence well-being (Macky & Boxall, 2008). Helping behaviors at work can enhance well-being by providing access to additional resources.

Recent psychological research has explored how individuals perceive well-being, focusing on the hedonic and eudaimonia models, which define well-being through positive emotions and personal growth, respectively (McMahan & Estes, 2010; Disabato et al., 2016).

Employee Engagement: Employee engagement refers to an employee's cognitive and emotional state at work, shaping their connection to job roles (Al-dalahmeh et al., 2018). The concept originated with Kahn (1990), who is credited with establishing the employee engagement paradigm (Welch, 2011). Yalabik et al. (2017) describe engagement as a specific and rigorous relationship between employees and their work, emphasizing that active, engaged employees contribute more effectively to organizational goals. This engagement is fostered by clear compensation, recognition, and career development opportunities, which build trust (Jena et al., 2018).

Engaged employees perform better, go beyond their job duties, and enhance customer satisfaction. Organizational commitment is closely tied to task focus, and research by Schaufeli and others has linked engagement with health, well-being, and burnout, which affects productivity and success (Schaufeli et al., 2002). A workplace that promotes engagement is vital for both organizational performance and employee well-being, with low engagement levels leading to stress, demotivation, and turnover (Bevan, 2010). High engagement helps organizations weather adversity and retain loyal employees during changes (Miller, 2016).

However, excessive engagement can also be harmful, as noted by Christian et al. (2011) and George (2011), while disengagement negatively impacts well-being and performance (Shuck & Reio, 2013). Employee engagement serves as a tool to enhance well-being and maintain resilience (Cooper, 2014). Research shows that highly engaged employees report better well-being and personal success, while low engagement is linked to emotional exhaustion and depersonalization. Employees with higher well-being are significantly more engaged, satisfied with their work, loyal to their teams, and likely to recommend their company (Limeade & Quantum Workplace, 2016).

Employee engagement is closely tied to positive outcomes such as creativity, client satisfaction, and task performance (Bakker & Albrecht, 2018). Studies consistently demonstrate a positive relationship between engagement and employee well-being (Robertson et al., 2012; Matz-Costa et al., 2012).
H1: There is a significant relationship between employee engagement and employee well-being.

Physical Wellness: The World Health Organization (WHO) defines wellness as a state of complete physical, mental, and social well-being, beyond just the absence of illness. This holistic view emerged after World War II when harsh working conditions adversely impacted employees' health. The wellness movement, supported by figures like Dr. Halbert Louis Dunn, focuses on individuals' overall well-being and potential (Dunn, 1961).

Workplace wellness programs, as defined by the Centers for Disease Control (CDC), include activities or policies that promote healthy behaviors and improve health outcomes at work. These programs aim to enhance employees' physical, interpersonal, intellectual, spiritual, environmental, psychological, and occupational well-being. Addressing all dimensions of well-being, not just physical health, is essential for productivity and maintaining a balanced workforce. Research shows that investing in employee well-being yields significant returns, with a 10 to 1 return on investment (Johnson & Johnson, 2003).

Physical wellness is one of the most recognized aspects, with employees often able to detect physical health issues like flu or back pain. However, poor physical wellness is frequently caused by unhealthy habits, such as poor diet, lack of exercise, and substance abuse. These issues can affect productivity and organizational performance. Workplace wellness programs can mitigate these effects by encouraging healthier lifestyles and improving overall employee well-being.

Since the 1950s, employers have supported employee well-being through programs addressing mental health and substance abuse, which evolved into broader wellness initiatives in the 1970s and gained popularity in the 1980s and 1990s. Studies have shown that wellness programs reduce healthcare costs, lower absenteeism, and attract talent. A recent article emphasizes the importance of workplace wellness programs, showing that they significantly boost employees' physical health and lower stress, resulting in happier and more fulfilled workers (Bianchi & Fabbro, 2022). Additionally, research indicates that employees with higher physical fitness experience less burnout and psychological distress, underscoring the critical role physical health plays in overall worker well-being (Gerber et al., 2021).

According to the 2019 Health and Well-Being research by the O.C. Tanner Institute, wellness programs increase employee engagement, loyalty, and productivity while reducing long-term healthcare costs. Despite these benefits, only a small percentage of employees feel their employers prioritize emotional and social well-being alongside physical health.
H2: There is a significant relationship between physical wellness and employee well-being.

Work-life Balance: Work-life balance refers to the equilibrium between personal and professional responsibilities. Various terms are used by scholars, including "work-family balance," "work-personal life

balance," and "work-family fit." Definitions vary, but common themes include managing time between work and home duties and reducing role conflict.

Researchers like Jyothi and Jyothi (2012) describe work-life balance as the ability to meet both personal and professional demands. Valcour (2007) emphasizes that satisfaction in both areas leads to overall fulfillment. However, Frone (2003) notes that work often intrudes more on family time than vice versa. Theories like Boundary Theory, Compensation Theory, and Spillover Theory explore how experiences in one domain affect the other. Organizations increasingly recognize the importance of work-life balance and offer benefits like flextime, telecommuting, and family-friendly policies to help employees manage their responsibilities. These initiatives address not just professional obligations but also personal needs like childcare, eldercare, and health care, aiming to reduce stress and improve overall well-being.

Work-life balance has become a prominent theme in recent literature, with studies showing it significantly impacts employee well-being. For instance, a study by Okeya et al. (2020) found that work-life balance strongly influences the health of Nigerian bank employees. Organizations are encouraged to enhance working conditions to support employee well-being, as those who achieve balance tend to be healthier and more productive.

There is a strong positive relationship between work-life balance and job satisfaction. Employees who manage their personal and professional lives effectively experience higher job satisfaction and reduced burnout, which contributes to better mental and emotional well-being in the workplace (Dousin et al., 2019). Additionally, organizations should foster a supportive culture with flexible working hours and encouraging supervisors, as these factors significantly enhance employee well-being, reduce psychological distress, and improve engagement and productivity (Lamane-Harim et al., 2021).

In addition, Konrad and Mangel (2000) argue that balancing work and home demands is crucial for avoiding conflicts, particularly in industries requiring highly skilled employees. Achieving work-life balance benefits both individuals and organizations, leading to increased productivity, job satisfaction, and morale. In sum, work-life balance practices positively impact employees' time and overall organizational productivity.
H3: There is a significant relationship between work-life balance and employee well-being.

3. Research Methodology

The researcher collected primary data directly through online survey questionnaires. A quantitative approach was employed, focusing on statistical analysis of the data. Before actual data collection, a pilot test was conducted between 12th October and 1st November 2021, approved by the Research Ethics Committee. This pilot test aimed to ensure the reliability and validity of the questionnaire, involving 30 randomly selected employees from MunchWorld Marketing Sdn. Bhd., a company similar to the one under study. The pilot data was analyzed using SPSS Version 24.0 to calculate Cronbach's Alpha, confirming the instrument's reliability.

The actual data collection occurred from 23rd November to 30th December 2021. The researcher coordinated with the human resource administrator at Nabati Food Malaysia to distribute the survey. Due to strict safety protocols, in-person distribution was not possible. Instead, the researcher provided an online questionnaire link to the HR admin, who then redistributed it to employees. This approach ensured data collection continuity despite the pandemic, and the reliability of the questionnaire was further confirmed by analyzing the pilot study results, which led to a smooth and effective data collection process.

Descriptive statistics were employed, including frequencies, means, and standard deviations, while inferential statistics included Multiple Regression Analysis. Reliability was assessed with Cronbach's Alpha, requiring a minimum of 0.7 for internal consistency. Pearson correlation analysis measured the strength of relationships. Between variables and multiple regression determined the impact of independent variables on dependent variables, with R-values, F-tests, and p-values used to assess model accuracy and significance.

4. Findings and Analysis

Demographic Analysis: According to Table 1 below, the demographic data from Nabati Food Malaysia Sdn. Bhd. Shows that 63.1% of respondents were female, and 36.9% were male. Most respondents (57.2%) were aged between 20-29 years, with the least (5.3%) aged 50 and above. A majority (59.9%) were single, while 38% were married. The majority of respondents Malay (67.4%), followed by Chinese (24.1%), Indian (6.4%), and others (2.1%), mainly Indonesians. Most respondents held a Bachelor's degree (59.9%), with the majority having 1-5 years of service (46.5%), and the minority had over 5 years of service (24.6%).

Table 1: Summary of Respondents' Demographic Profiles

Demographic Information		Frequency	Percentage%
Gender			
	Male	69	36.9
	Female	118	63.1
Age			
	20-29 years old	107	57.2
	30-39 years old	53	28.3
	40-49 years old	17	9.1
	50 years old and above	10	5.3
Marital Status			
	Single	112	59.9
	Married	71	38
	Divorced	4	2.1
Race			
	Malay	126	67.4
	Indian	12	6.4
	Chinese	45	24.1
	Others	4	2.1
	SPM	8	4.3
Education level			
	STPM/Foundation/Matriculation	1	0.5
	Diploma	64	34.2
	Bachelor Degree	112	59.9
	Master	2	1.1
Year of Service			
	Less than a year	54	28.9
	1-5 years	87	46.5
	More than 5 years	46	24.6

Reliability Analysis: In the statistical reliability study, Cronbach's alpha reliability coefficient was employed. A reliability coefficient (r) greater than 0.6 indicates a high level of dependability and acceptance, while a coefficient of 0.8 or above signifies an extremely high level of reliability (Pallant, 2001). An Alpha Cronbach rating of less than 0.6 is considered poor. According to Tavakol and Dennick (2011), Cronbach's Alpha should range between 0 and 1, with values closer to 1.0 indicating higher internal consistency. However, Hulin, Netemeyer, and Cudeck (2001) suggest that a Cronbach's Alpha coefficient greater than 0.95 may not always be ideal, as it could indicate redundancy in the items.

In this study, the reliability coefficients of three independent variables and one dependent variable were determined using Cronbach's Alpha. Table 2 presents the results of the reliability analysis. The variables—employee engagement, physical wellness, work-life balance, and employee well-being—had Cronbach's alpha values of 0.781, 0.781, 0.590, and 0.782, respectively. All factors were confirmed to be reliable (Hair, Babin, Money, and Samuel, 2013). Although Cronbach's Alpha score for work-life balance was the lowest at 0.590, it was still considered acceptable, possibly due to specific question content (Juul, Rensburg, and Steyn, 2012). Therefore, the questionnaire used in the study is deemed reliable.

Table 2: Reliability Analysis Results

Variables	No of Items	Cronbach's Alpha	Degree of Reliability
Employee Engagement	10	0.781	Good
Physical Wellness	7	0.781	Good
Work-Life Balance	10	0.590	Acceptable
Employee Well-Being	10	0.782	Good

Descriptive Analysis: The study used descriptive analysis to examine data, focusing on the mean and standard deviation of various variables measured with a five-point Likert Scale. The interpretation range was divided into three categories—low (1 to 2.33), average (2.34 to 3.67), and high (3.68 to 5.00). The results showed that employee engagement had the highest mean score (4.4246) with a standard deviation of 0.30714, followed by employee well-being (mean = 4.1852, SD = 0.34278), physical wellness (mean = 4.0321, SD = 0.44988), and work-life balance (mean = 3.3791, SD = 0.35141). The findings suggest that employee engagement is the most significant factor influencing employees' well-being at Nabati Food Malaysia Sdn. Bhd.

Table 3: Mean and Standard Deviation for Independent Variables and Dependent Variable

Variables	Mean	Std. Deviation (SD)	Minimum	Maximum
Employee Engagement	4.4246	0.30714	3.20	5.00
Physical Wellness	4.0321	0.44988	2.71	5.00
Work-Life Balance	3.3791	0.35141	2.30	4.80
Employee Well-Being	4.1852	0.34278	2.25	5.00

Normality Test: A normality test was used to determine the data distribution, with skewness and kurtosis values calculated to assess its symmetry and "peakiness," respectively. According to Tabachnik and Fidell (2012), normality requires prediction errors to be evenly distributed around the expected score of the dependent variable. Data plots indicated a normal distribution, appearing uniformly along a diagonal line (Coakes, 2013). Descriptive statistics were used to check assumptions, revealing skewness and kurtosis values less than 3 for each variable, suggesting normality (Coakes, 2013). Hair and Bryne (2010) noted that kurtosis values within ±7 are also acceptable. Table 4 shows skewness and kurtosis values for independent variables such as employee engagement, physical wellness, and work-life balance, with employee well-being as the dependent variable.

Table 4: Skewness and Kurtosis Values for Independent Variables and Dependent Variable

Variables	Skewness	Kurtosis
Employee Engagement	-0.372	0.974
Physical Wellness	-0.198	-0.179
Work-Life Balance	0.596	3.275
Employee Well-Being	-0.968	5.745

Pearson Correlation Analysis: This study used correlation analysis to assess the strength and direction of the relationships between variables and to test the study's hypotheses. Pearson Correlation (r) was used to measure the degree of the association, while the significance value (p) indicated whether a relationship existed. As shown in Table 5, the analysis found positive correlations between three independent variables and employee well-being. Employee engagement and employee well-being showed a moderate positive correlation ($r = 0.505$, $p = 0.000$), physical wellness and employee well-being showed a low positive correlation ($r = 0.464$, $p = 0.000$), and work-life balance and employee well-being had a little positive correlation ($r = 0.203$, $p = 0.005$). The correlation coefficient was interpreted based on the "Rule of Thumbs for Interpreting the Size of a Correlation Coefficient" by Cohen (1988).

Table 5: Pearson Correlation Analysis Employee

Variables		Employee Engagement	Physical Wellness	Work-life Balance	Employee Well-being
Employee	Pearson Correlation	1			
Engagement	Sig. (2-tailed)				
	N	187			
Physical	Pearson Correlation	0.094	1		
Wellness	Sig. (2-tailed)	0.202			
	N	187	187		
Work-life	Pearson Correlation	0.102	0.008	1	
Balance	Sig. (2-tailed)	0.165	0.917		
	N	187	187	187	
Employee	Pearson Correlation	0.505**	0.464**	0.203**	1
Well-being	Sig. (2-tailed)	0.000	0.000	0.005	
	N	187	187	187	187

** Correlation is significant at the 0.01 level (2-tailed)

Multiple Regression Analysis: A multiple regression analysis was conducted to explore the relationship between factors affecting employee well-being and to identify which factor has the greatest impact at Nabati Food Malaysia Sdn. Bhd. Multiple regression is described as an extension of bivariate correlation, used to identify the best predictors of an outcome. As presented in Table 6, the results showed that employee engagement, physical wellness, and work-life balance together explained 45.4% of the variance in employee well-being ($R^2 = 0.454$), leaving 54.6% of the variance unexplained, suggesting that other variables not included in the study could further strengthen the model.

The ANOVA results indicated that all three variables significantly predict employee well-being ($F = 50.778$, $p = 0.000$). Coefficient analysis revealed that all independent variables (employee engagement, physical wellness, and work-life balance) significantly contribute to employee well-being at a significance level of $p < 0.05$. Among them, employee engagement has the highest impact, with a Beta value of 0.503 ($p = 0.000$), indicating it is the strongest predictor of employee well-being.

Table 6: Regression Analysis Results

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	0.161	0.342		0.471	0.638
	Employee	0.503	0.062	0.450	8.168	0.000
	Physical	0.321	0.042	0.421	7.674	0.000
	Work-life	0.150	0.054	0.154	2.802	0.006
	R		0.674[a]			
	R Square		0.454			
	F		50.778			
	Sig.		0.000[b]			

a. Dependent Variable: Employee Well-being
b. Predictors: (Constant), Employee Engagement, Physical Wellness, Work-life Balance

Discussion of Results: There was a significant positive relationship between employee engagement and employee well-being (β = 0.503, p = 0.000). The results suggest that higher employee engagement leads to improved employee well-being, while low engagement is associated with poorer well-being, potentially.

Affecting organizational growth. These findings are consistent with studies by Shuck and Reio (2013) and Bakker et al. (2014), which also reported that high engagement correlates with greater well-being and job satisfaction. However, the results contrast with Skurak, Naswall, and Kuntz (2018), who found no statistically significant relationship, likely due to a smaller sample size. Overall, the study supports the hypothesis (H1) that employee engagement significantly impacts employee well-being.

Moreover, the study also found a significant positive relationship between these two variables (β = 0.321, p = 0.000), indicating that employee well-being is closely linked to physical wellness. This finding aligns with the previous study by Khatri and Gupta (2019), which also demonstrated a positive relationship between physical wellness and employee well-being. The results suggest that organizations should invest in their employees' physical wellness to maintain optimal well-being. Thus, the hypothesis (H2) is supported by the data, confirming a significant relationship between physical wellness and employee well-being.

In addition, the analysis revealed a significant positive relationship between work-life balance and employee well-being (β = 0.150, p = 0.006), suggesting that employee well-being is relatively dependent on maintaining a good work-life balance. Disruptions, such as working inappropriate hours, negatively affect this balance and overall well-being. Dasgupta (2016) highlighted that companies believe a healthy work-life balance is a key preventive measure for employee health and well-being. The findings are consistent with studies by Khatri and Gupta (2019) and Soomro, Breitenecker, and Shah (2018), which also found a positive association between work-life balance and employee well-being, noting its impact on employee performance. These results support the hypothesis (H3) that a strong link exists between work-life balance and employee well-being, demonstrating its importance in organizational settings.

5. Recommendations and Conclusion

Recommendations for the Top Management of Nabati Food Malaysia: This study used regression analysis to explore the relationship between employee engagement, physical wellness, work-life balance, and employee well-being. The results revealed that all three independent variables positively impact employee well-being, with employee engagement emerging as the most significant factor. This indicates that employees at Nabati Food Malaysia perceive engagement as a key driver of their well-being.

To enhance employee well-being, several recommendations are proposed. First, organizations should foster open communication by encouraging employees to express their ideas and concerns. Facilitating round-table discussions can create a safe environment for sharing thoughts, which can lead to valuable contributions and greater employee engagement. Second, encouraging employees to pursue side projects can stimulate creativity and improve time management. This approach not only engages employees but also makes them feel valued and secure, which can positively affect their well-being and work performance. Third, promoting a positive health and wellness environment is essential. Companies can support this by providing gym memberships, massage therapy, or simply stocking nutritious snacks in the office. Such initiatives help employees manage stress and maintain clarity, contributing to overall well-being.

Additionally, implementing flexible work-from-home policies can greatly benefit employees. While not all organizations can offer regular remote work, providing occasional work-from-home opportunities can improve work-life balance and job satisfaction. Besides, offering career advancement opportunities is another key recommendation. Employees who see a clear path for progression are more likely to be motivated and committed to the organization's success. According to O'Reilly and Tushman (2011), leveraging current advantages while exploring new opportunities is crucial for maintaining competitive advantage and adapting to changing business conditions.

Paid vacation time is also vital. Modern workplaces should recognize the importance of vacations, not as a luxury but as a necessity. Allowing employees to take extended breaks without financial penalties helps them

return to work rejuvenated, which enhances productivity and overall well-being. Also, providing on-site childcare facilities can further support employees, particularly parents who struggle with work-life balance. In-house daycare services can create a more motivating and supportive work environment for employees with young children.

Recommendations for Future Researchers: The current study was limited to Nabati Food Malaysia and the fast-moving consumer goods (FMCG) sector, which restricts the generalizability of the findings. Future research should explore other industries or sectors in Malaysia, such as retail, telecommunication, financial services, or healthcare to obtain a larger sample size and more comprehensive results. Additionally, future studies could expand the scope by including other factors affecting employee well-being, such as employee empowerment, workload, personal growth, and job motivation. Investigating a broader range of determinants could provide more nuanced insights into employee well-being.

Furthermore, employing qualitative research methods could enrich the data. Qualitative approaches offer deeper insights into employee behaviors, attitudes, and experiences, leading to more accurate and reliable findings. Observational data and detailed interviews can enhance understanding and provide valuable context beyond quantitative analysis.

Limitations: The study encountered several limitations and challenges. First, convenience sampling was employed due to restrictions on accessing a comprehensive list of participants and limitations on distributing surveys across departments, driven by privacy concerns and strict organizational rules. To overcome this, the researcher used Google Forms and distributed the survey through the HR admin.

Second, the study focused solely on employees of Nabati Food Malaysia Sdn. Bhd., a single company in the fast-moving consumer goods (FMCG) sector. To gain a broader perspective, data should ideally be collected from multiple FMCG companies. Finally, the researcher faced difficulties in obtaining relevant literature on employee well-being and working environments in the Malaysian FMCG context, as most available data came from Western studies.

Conclusion: This study explored how employee engagement, physical wellness, and work-life balance impact employee well-being at Nabati Food Malaysia Sdn. Bhd. Findings indicate that employee engagement is the most significant factor influencing well-being, highlighting its importance for fostering a positive employee experience. Physical wellness also positively affects well-being, emphasizing the value of health initiatives in the workplace. While work-life balance is important, its impact is less pronounced compared to engagement and wellness. The study suggests that organizations should focus on enhancing engagement, promoting physical health, and supporting work-life balance to improve overall employee well-being. Future research should investigate these factors across different industries for a broader understanding.

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From Gaming Elements to Purchase Intentions: The Influence of Perceived Enjoyment and Promotion Focus in Online Travel Bookings

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Abstract: This study examines the impact of gamification on purchase intentions in Malaysia's online travel booking industry. As traditional platforms like Expedia face declining bookings due to economic challenges and the rise of competitors such as Airbnb, Agoda, and Booking.com, understanding the role of gamification in user engagement becomes crucial. The research employs Partial Least Squares Structural Equation Modeling (PLS-SEM) to analyze the effects of extrinsic and intrinsic gaming elements, perceived enjoyment, and promotional focus on purchase intention. A total of 141 respondents participated in the survey and the key findings reveal that extrinsic gaming elements, including points and rewards, have a significantly stronger impact on perceived enjoyment than intrinsic elements like membership levels. This heightened enjoyment, in turn, positively influences purchase intention. Additionally, the study finds that promotional focus moderates the relationship between perceived enjoyment and purchase intention, further enhancing the effect. The Importance-Performance Map Analysis (IPMA) indicates that while intrinsic gaming elements perform below average, they are less critical than other factors. Managers should prioritize improving aspects of high importance, but currently have, low performance to boost purchase intentions effectively. Overall, the research provides actionable insights for enhancing competitiveness in Malaysia's digital travel marketplace, emphasizing the need for targeted gamification strategies to align with evolving consumer preferences. The findings offer a foundation for developing strategies that can help travel platforms maintain relevance and drive engagement in a competitive landscape.

Keywords: *Gamification, Online Travel Purchase Intention, Gaming Elements, Perceived Enjoyment, Promotion Focus*

1. Introduction and Background

The global online travel industry, including Malaysia's tourism sector, has undeniably undergone a significant transformation. Platforms like Expedia, once seen as dominant players in the travel booking space, are now experiencing a notable decline in bookings (Chiang, 2023). This downturn is particularly evident in Malaysia, where economic challenges and the rise of alternative platforms such as Airbnb, Agoda, and Booking.com have reshaped the travel booking landscape. The rapid expansion of these competitors, combined with the evolving preferences of Malaysia's tech-savvy travelers, has significantly altered the competitive dynamics within the digital travel market.

Expedia and similar platforms have strategically employed gamification techniques to boost user engagement and cultivate customer loyalty among Malaysian consumers. Despite these efforts, they struggle to maintain their competitive edge against platforms offering more innovative and culturally tailored gamified experiences. In Malaysia, gamification elements such as interactive features, rewards systems, and social engagement tools have attracted considerable attraction, becoming key differentiators in the online travel booking sector (Rahmadhan et al, 2023).

As Malaysian consumer behavior shifts in response to gamified experiences on platforms like Airbnb, Agoda, and Booking.com, the importance of purchase intention has grown. The interplay between gamification, user experience, platform features, and strategic positioning is critical in influencing user engagement and the likelihood of making a booking on these platforms within the Malaysian market (Kosir, 2022). This study explores how gamification (gaming elements) affects users' propensity to engage in booking behavior

specifically in Malaysia. The research aims to uncover the key factors influencing Malaysian consumers' booking intentions on travel apps, providing insights into why platforms like Expedia are witnessing a decline in bookings compared to those that have successfully implemented gamification strategies.

Furthermore, this study will offer valuable insights into the role of gamification in shaping booking intentions within Malaysia's online travel environment. By examining these dynamics, the research seeks to establish a foundation for developing strategies that enhance competitiveness in Malaysia's continuously evolving digital travel marketplace. This is particularly important as Malaysia continues positioning itself as a key travel destination in Southeast Asia, where digital innovation and consumer engagement are pivotal to capturing market share.

2. Literature Review

Purchase Intention: The concept of purchase intention in online travel bookings has garnered significant attention in recent years, particularly as the travel industry has increasingly shifted towards digital platforms. Purchase intention, defined as the likelihood that a consumer will buy a product or service, is critical to the success of online travel agencies (OTAs) and booking platforms. Numerous studies have examined the factors influencing purchase intention, with trust, perceived value, and ease of use emerging as key determinants. According to Hamdan and Yuliantini (2021), trust in an online platform significantly impacts consumers' willingness to complete a booking, reducing perceived risk and enhancing confidence in the transaction. Platforms that effectively communicate value propositions, such as exclusive deals, comprehensive travel packages, and flexible cancellation policies, are more likely to convert browsing into bookings.

In addition to trust and perceived value, user experience and website design have been highlighted as influential factors in online travel booking. Research by Yeo et. al. (2020) found that an intuitive and user-friendly interface positively affects purchase intention by facilitating more straightforward navigation and reducing the effort required to complete a booking.

Extrinsic Gaming Elements: Extrinsic gaming components such as achievements, points, rewards, badges, and prizes are frequently used in gamified platforms to enhance user engagement. In online travel booking platforms, points are one of the most commonly utilized elements (Salim & Kim, 2023). Points typically represent a quantifiable reward for completing specific actions or tasks within a platform. For instance, on travel booking platforms, users might earn points by booking flights or accommodations, writing reviews after their trips, or simply logging in regularly. Similar to how Shopee awards "Shopee Coins" for various activities, these points can be accumulated and redeemed for discounts or perks on future bookings.

According to Wu and Santana (2022), extrinsic gaming elements like points and badges positively impact users' perceived enjoyment. Travelers earn points by achieving particular goals or participating in specific challenges on gamified travel platforms. These points and badges serve as rewards and encourage users to reassess their booking decisions, often leading to increased commitment to the platform. Badges, in particular, motivate users to engage in a variety of travel-related activities, enhancing their overall involvement. The research by Feng et al. (2020) supports this, suggesting that customers are more likely to make bookings on platforms that incorporate engaging and entertaining features like gamification.

Mucollari and Samokhin (2017) proposed that extrinsic motivation is crucial in increasing users' engagement on gamified platforms. These features can stimulate the users' enjoyment, leading to greater engagement with the travel booking platform. This heightened engagement often results in customers making additional bookings and remaining loyal to the platform for extended periods. The desire to accumulate and redeem points or badges drives users to stay active on the platform, encouraging them to book more frequently and explore new travel opportunities. Therefore, it is hypothesized that;
H1: Extrinsic gaming elements have a significant positive influence on perceived enjoyment.

Intrinsic Gaming Elements: Wu and Santana (2022) found that intrinsic factors, such as membership levels and rewards, positively impact perceived enjoyment, driving higher sales and reinforcing brand loyalty. For online travel booking platforms, membership tiers can play a crucial role through appealing benefits and

exclusive features. Members are encouraged to explore and book through the platform with access to special discounts, promotions, and early access to deals.

On top of that, Xu et al. (2020) also found that individuals are more intrinsically motivated and experience greater satisfaction when their needs are met. This increased motivation leads to higher engagement and influences consumer booking behavior. Users feel more engaged and rewarded on travel booking platforms when their preferences and needs are acknowledged and addressed through gamification features. By integrating these elements, platforms can create a positive and rewarding booking experience, enhancing user satisfaction and influencing customer perceived enjoyment. Therefore, it is hypothesized that;
H2: Intrinsic gaming elements have a significant positive influence on perceived enjoyment.

Perceived Enjoyment: Hasan et al. (2021) noted that customers are more likely to adopt new technologies and methods when they offer inherent benefits like entertainment and enjoyment. Their research suggests that perceived enjoyment positively affects online booking intentions, with factors such as excitement and fun playing a substantial role. Furthermore, the quality of a travel booking app's interface also impacts perceived enjoyment, which in turn has a modest but positive effect on users' booking intentions (Patel et al., 2020).

Kamis et al. (2021) also recognized this and demonstrated a positive link between perceived enjoyment and booking intention. It was found that when users experience enjoyment during the booking process, it enhances their overall satisfaction and happiness, leading to increased booking intentions. Therefore, it is hypothesized that;
H3: Perceived enjoyment has a significant positive influence on the intention to purchase.

Promotion Focus: Maharani and Ali (2019) found that promotional efforts have a significant positive impact on consumers' intentions to book travel online. Their research highlights those sales promotions, in particular, are closely associated with increased brand recognition and can strongly influence booking intentions. The study underscores the importance of well-designed promotions, noting that when travelers perceive them positively, they are more likely to proceed with bookings. In essence, the research emphasizes that strategically planned promotional activities, especially those offering discounts and deals, play a vital role in shaping travelers' perceptions of a travel booking platform, thus enhancing their likelihood to book.

Similarly, Hongdiyanto et al. (2020) found that promotions on online travel booking platforms have a significant and positive effect on customers' booking intentions. Their analysis revealed a robust statistical link between promotional activities and the likelihood of making a booking, supporting their initial hypothesis. The study confirms that effective promotional efforts, such as special offers and exclusive deals, have a tangible and beneficial impact on encouraging travelers to make bookings, validating the anticipated connection outlined in their research. Therefore, it is hypothesized that;
H4: Promotional Focus moderates the relationship between Perceived Enjoyment and the Intention to Purchase.

3. Research Methodology

Purposive sampling was employed for the study. A filter question was added to ensure that only those with experience making an online travel purchase are eligible to participate in the survey. A total of 141 usable and valid cases were utilized for the analysis. Since the study's objective was to predict key target constructs or identify main driver constructs, partial least squares structural equation modeling (PLS-SEM) with the PLS software package was employed for data analysis (Hair et al., 2022). The analysis focused on both the measurement model and the structural model to achieve the study's goals.

4. Results and Discussion

Profile of Respondents: Table 1 provides a detailed breakdown of the gender distribution among the participants in the survey. The table shows that the sample consisted of 79 females and 62 males. This distribution reflects the gender composition of the survey respondents, highlighting a total of 141 individuals who took part in the study. The data indicates a slightly higher number of female participants compared to

male participants. This demographic information is crucial for understanding the composition of the sample and can provide context for analyzing the results of the study. By presenting this information, Table 1 helps to clarify the gender distribution of the respondents and offers insights into the demographic characteristics of the study population. Table 1 tabulates the gender frequency of 79 females and 62 males who participated in the survey for the study.

Table 1: Frequency of Demographic Gender

Gender	Frequency	Percent
Female	79	56
Male	62	44
Total	141	100

Measurement Model Analysis: To perform regression analysis effectively, the data used must be both valid and reliable. Validity in this context was assessed using two key criteria: convergent validity and discriminant validity. Convergent validity evaluates factor loadings, average variance extracted (AVE), and composite reliability (CR), as displayed in Table 2.

Factor loadings exceeded the recommended threshold of 0.708 (Hair et al., 2022). The AVE results, which reflect the proportion of variance captured by the construct relative to the variance due to measurement error, showed that all variables had AVE values greater than the threshold of 0.5. This suggests a minimal level of measurement error. Among the variables, Purchase Intention had the highest AVE value of 0.784, demonstrating the strongest convergence. Perceived Enjoyment followed with an AVE of 0.701, while Extrinsic Gaming Elements had the lowest AVE at 0.581. Additionally, the composite reliability values for all constructs were also above the acceptable cut-off of 0.5, further supporting the reliability of the measures used in this study (Hair et al., 2022). Thus, the data meets the required standards for validity and reliability, ensuring robust regression analysis.

Table 2: Convergent Validity (Factor Loadings, CR and AVE)

Construct	Items	Factor Loadings	Composite Reliability (CR)	Average Variance Extracted (AVE)	R-square
Extrinsic GE	EG1	0.709	0.874	0.581	
	EG3	0.791			
	EG4	0.821			
	EG7	0.733			
	EG8	0.753			
Intrinsic GE	IG1	0.773	0.873	0.633	
	IG2	0.811			
	IG3	0.849			
	IG8	0.747			
Perceived Enjoyment	PE1	0.809	0.921	0.701	0.437
	PE2	0.814			
	PE6	0.849			
	PE7	0.841			
	PE8	0.871			
Promotional Focus	PF1	0.837	0.893	0.626	
	PF2	0.799			
	PF3	0.810			
	PF4	0.775			

	PF6	0.729			
Purchase Intention	PI3	0.869	0.956	0.784	0.573
	PI4	0.924			
	PI5	0.873			
	PI6	0.891			
	PI7	0.898			
	PI8	0.856			

Discriminant validity, an essential aspect of ensuring that different constructs are distinct from one another, was evaluated using the Heterotrait-Monotrait Ratio (HTMT), as detailed in Table 3. The HTMT ratio measures the degree to which indicators of different constructs are correlated, with lower values indicating better discriminant validity.

Table 3 presents the HTMT analysis results, revealing that all the HTMT ratios are below the threshold of 0.90. This threshold is a commonly accepted standard for demonstrating that constructs are sufficiently distinct from each other. Values below this threshold suggest that the constructs measured are not excessively overlapping and that each construct captures unique aspects of the data.

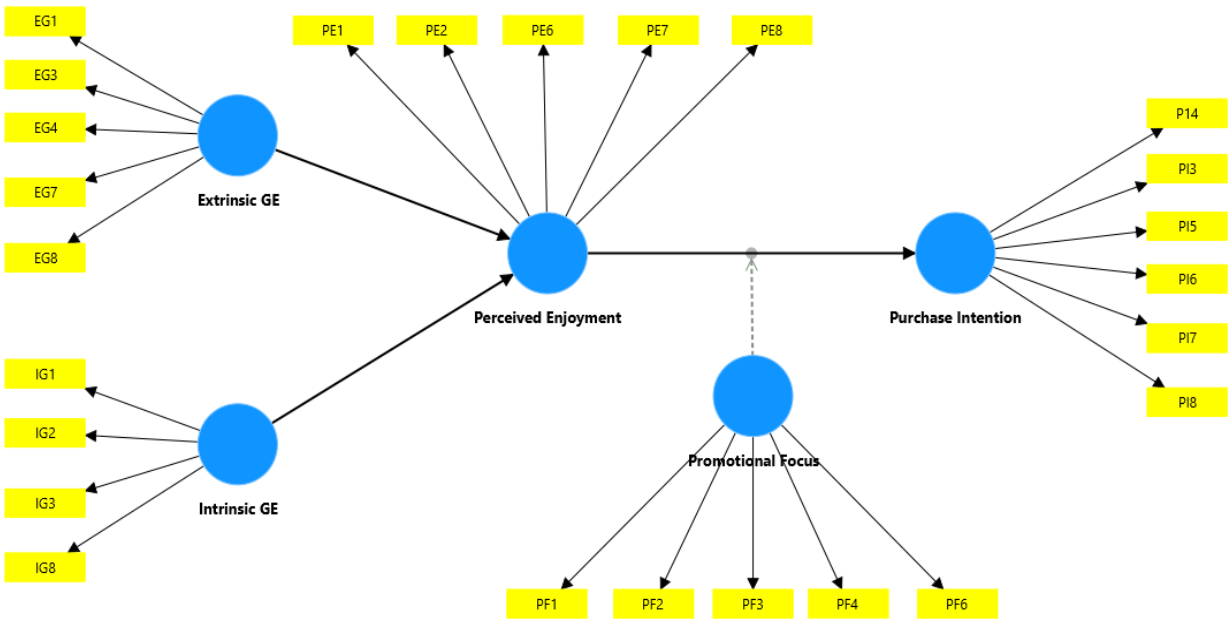
The fact that all HTMT values in this study are below the 0.90 cut-off indicates that the constructs in the survey exhibit strong discriminant validity. This implies that the variables measured are indeed distinct and that the analysis is robust in terms of separating different dimensions of the constructs being studied. As a result, the study can confidently assert that the variables are reliable and valid, in line with the standards set by Hair et al. (2022). This rigorous validation process helps ensure the accuracy and credibility of the findings derived from the regression analysis.

Table 3: Discriminant Validity: Heterotrait-Monotrait ratio (HTMT)

	1	2	3	4	5
Extrinsic GE (1)					
Intrinsic GE (2)	0.471				
Perceived Enjoyment (3)	0.727	0.425			
Promotional Focus (4)	0.635	0.395	0.657		
Purchase Intention (5)	0.657	0.466	0.764	0.653	

Structural Model Analysis: The evaluation of the inner model path estimates for this study was permitted due to the outer model estimation of this study which is reliable and valid (Henseler et al., 2015). Once the construct measures were confirmed as being reliable and valid, the next step is to assess the relationships among constructs incorporated in the hypothesized conceptual framework as depicted in Figure 1 below.

Figure 1: Conceptual Framework



The structural model analysis was conducted to verify whether the results of the structural model support the conceptual model as hypothesized. Table 4 summarizes the findings of all the relationship assessments.

Table 4: Hypotheses Testing

	Hypotheses	Beta	f-value	t-value	p-values
H1	Extrinsic GE -> Perceived Enjoyment	0.551	0.52	7.790	0.00
H2	Intrinsic GE -> Perceived Enjoyment	0.272	0.04	3.796	0.00
H3	Perceived Enjoyment -> Purchase Intention	0.398	0.31	4.201	0.00
H4	Promotional Focus x Perceived Enjoyment -> Purchase Intention	0.119	0.06	2.161	0.03

(*p<0.05)

From the Table 4 above, the structural measurement results indicated the following values; H1: Extrinsic GE→ Perceived Enjoyment (t-value= 7.790, f-value = 0.52, p-value<0.05), H2: Intrinsic GE→ Perceived Enjoyment (t-value = 3.796, f-value = 0.04, p-value<0.05), H3: Perceived Enjoyment → Purchased Intention (t-value = 4.201, f-value = 0.31, p-value<0.05), H4: Promotional Focus x Perceived Enjoyment → Purchased Intention (t-value = 2.161, f-value = 0.06, p-value<0.05). The results indicate that all four hypotheses are supported.

Extrinsic gaming elements were found to have a significantly stronger impact on perceived enjoyment compared to intrinsic gaming elements, with a t-value of 7.790 for extrinsic elements versus 3.796 for intrinsic elements. The effect size of extrinsic gaming elements on perceived enjoyment is substantial, with an f-value of 0.52, which exceeds the threshold of 0.35 for large effects. In contrast, the effect size of intrinsic gaming elements is smaller, with a f-value of 0.04, which is only slightly above the minimal range of 0.02 to 0.14 for small effects. Additionally, the results show that promotional focus positively moderates the relationship between perceived enjoyment and purchase intention, with a strength of 2.161. These findings are in line with the previous researcher (Almaudina, et al., 2023; Chang & Yu, 2023; Halim et al, 2022; Haziri et al, 2019; Kusumawardani et al, 2023

5. Managerial Implications and Recommendations

The Importance-Performance Map Analysis (IPMA), is a valuable method for uncovering additional insights and drawing meaningful conclusions. By evaluating both the importance and performance dimensions, the IPMA helps prioritize constructs that need improvement to enhance specific target outcomes. Table 5 displays the findings. As illustrated in Figure 2, intrinsic gaming elements show a relatively low performance score of

63.9, indicating that, compared to other constructs, it is slightly below average. Furthermore, intrinsic gaming elements are considered a low-importance construct. A one-unit increase in the performance of intrinsic gaming elements from 63.96 to 64.96 would result in a marginal improvement in Purchase Intention, rising by just 0.11 points from 75.35 to 75.46. Therefore, when aiming to increase the performance of a target construct, managers should prioritize enhancing the performance of aspects captured by a construct with the highest (above average) importance, but a relatively low (below average) performance. This approach ensures that improvements are made in areas that will have the most significant impact on the target outcomes.

Figure 2: Importance-Performance Map

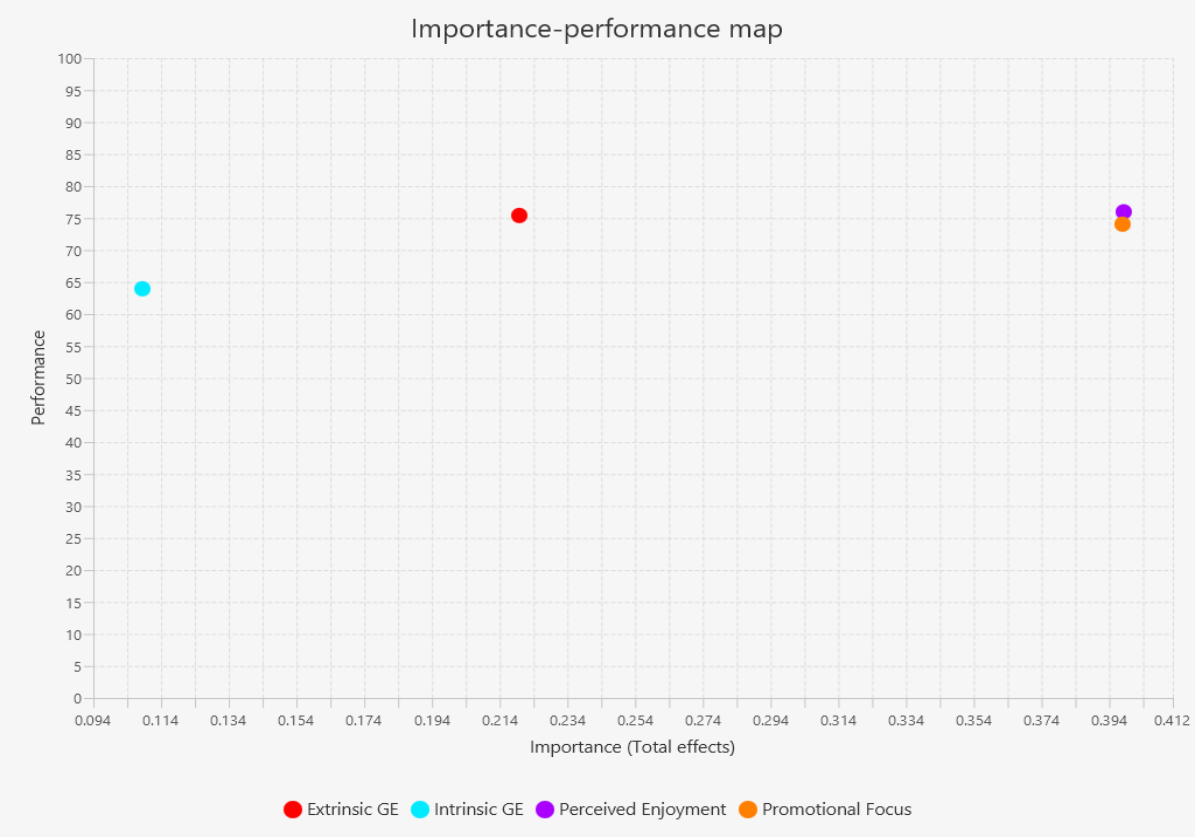


Table 5: Importance-Performance Map Analysis

	Importance→Purchase Intention	Performance
Extrinsic GE	0.22	75.41
Intrinsic GE	0.11	63.96
Perceived Enjoyment	0.40	75.98
Promotional Focus	0.40	74.05
Purchase Intention		75.35
Mean Value	0.28	72.35

Conclusion

This study provides a comprehensive analysis of the evolving dynamics in Malaysia's online travel booking industry, particularly focusing on the role of gamification in influencing purchase intentions. As traditional platforms like Expedia face declining bookings, this research highlights how emerging competitors such as Airbnb, Agoda, and Booking.com have effectively leveraged gamification to capture and retain customer interest.

The study's findings reveal that extrinsic gaming elements have a significantly greater impact on perceived enjoyment compared to intrinsic gaming elements, with a t-value of 7.790 versus 3.796, respectively. This indicates that features such as points, rewards, and badges are more effective in enhancing user satisfaction and engagement than membership levels or internal rewards. Furthermore, the effect size of extrinsic elements, with a f-value of 0.52, underscores their substantial influence on perceived enjoyment, while intrinsic elements show a smaller effect size of 0.04. This suggests that while both types of gamification elements contribute to perceived enjoyment, extrinsic elements have a more pronounced effect.

The study also confirms that perceived enjoyment significantly affects purchase intention, with a t-value of 4.201, supporting the hypothesis that enjoyable experiences lead to higher booking intentions. Additionally, promotional focus was found to positively moderate this relationship, enhancing the effect of perceived enjoyment on purchase intentions.

The Importance-Performance Map Analysis (IPMA) further provides actionable insights by highlighting areas where improvements can be most impactful. Intrinsic gaming elements, despite their lower performance score, are identified as less critical compared to other factors. Enhancing constructs with higher importance but currently lower performance is recommended to achieve substantial improvements in purchase intentions.

In conclusion, the study underscores the importance of incorporating effective gamification strategies to enhance user engagement and booking behaviors. For managers in the online travel sector, prioritizing extrinsic gaming elements and focusing on high-impact areas identified through IPMA can lead to improved competitiveness and better alignment with evolving consumer preferences. As Malaysia continues to be a key player in Southeast Asia's travel market, leveraging these insights will be crucial for platforms aiming to capture and retain market share amidst growing competition.

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Empowering Entrepreneurial Ecosystem: A Conceptual Paper on Exploring the Impact of Government Support on SMEs in Malaysia

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Abstract: SMEs continue to be a backbone for the development and growth of the economy in countries around the world. The success of SMEs depends on the effectiveness of EEs. One of the components of EEs that may contribute to the success of SMEs is government support. This paper proposes a conceptualization of the impact of government support (EE component), particularly on financial support and business support for SMEs in Selangor, Malaysia. This conceptual research provides important suggestions for researchers to assess the impact of government support on SME's business performance and also offers valuable insight for policymakers and other stakeholders to effectively design the initiatives that could enhance the growth and development of SMEs.

Keywords: *Entrepreneurial Ecosystem, SME, Government supports, Selangor*

1. Introduction and Background

Government involvement is critical in shaping the entrepreneurial ecosystem (EE). Previous researchers have found the value of government supports within EE by offering various support mechanisms such as training, financial assistance, informational support and marketing assistance (Petti, Compagnucci, & Tang, 2023; Wang, Li, Haq & Shahbaz, 2023; Feld, 2020). Other studies have highlighted the positive effects of government support on SMEs' business performance Yadewani, 2023; Nor, Hanafi & Saaidun, 2023; Kamilah and Kassim, 2021; Buba, Ramli, & Armanurah, 2021; Ishtiaq, Songling, Hassan & Hayat, 2020; Persada, Baihaqi, Awali, Saktia and Sutikno, 2020)and collaboration networks significantly enhance innovation performance (Lu, 2023). Similarly, government support is also important for entrepreneurs to sustain and maintain their persistence, especially after the pandemic of COVID-19 (Sahu & Panda, 2024; Otache & Usang, 2021). Studies done by Yang, Jaafar, Mamun, Salameh & Nawi (2022), Fitriasari (2020) and Ratnasingam, Khoo, Jegathesan, Wei, Abd Latib, Thanasegaran, Liat, Yi, Othman & Amir (2020) shown that effective interplay in governments supports contributes to enhancements of competitive advantage, survival and economic sustainability for SMEs. Government support can overcome the main obstacles of SMEs in accessing financial and other non-financial opportunities to improve performance (Nakku, Agbola, Miles, & Mahmood, 2020; Arshad, Ahmad, Ali & Khan, 2020).

Several studies have presented that the effectiveness of government supports is significantly different across industries depending on the nature of the industry, the characteristics of the firms within the industry as well as the external economic environment (Nguyen, Duy Van & Xuan, 2023; Guo, Zou, Zhang, Bo & Li, 2020). For instance, in the UK manufacturing sector, SMEs benefited from credit access, tax incentives and flexible regulations offered by the UK government to improve their firms' performance (Sohns & Wojcik, 2020). Similarly, in Pakistan's food industry tax relief significantly influenced SME performance Hassan, Ying, Ahmad & Ilyas, 2019) meanwhile study done in the SME foods industry in Korea acquired government certification support to maximize the SME's performance (Jeong, Shin, Kim, & Kim, 2021). This indicates that effective government support can assist SMEs enhance their competitiveness, innovation and resilience ultimately improving their overall performance.

Entrepreneurs in developed countries expect the government to fulfill their primary functions such as providing infrastructure, training, and financial opportunities to support an entrepreneurial environment. In Malaysia for instance, one of the nation's main agenda is nurturing the entrepreneurial environment. Ministries, state governments, and agencies plan and offer various support mechanisms such as creating a path for networking and collaboration, providing incubators and accelerators and funding opportunities. In 2023, the government of Malaysia allocated RM10.6 billion and implemented 225 programs to support 644, 731 SMEs by providing support mechanisms such as assess to financing, market access, human capital development and

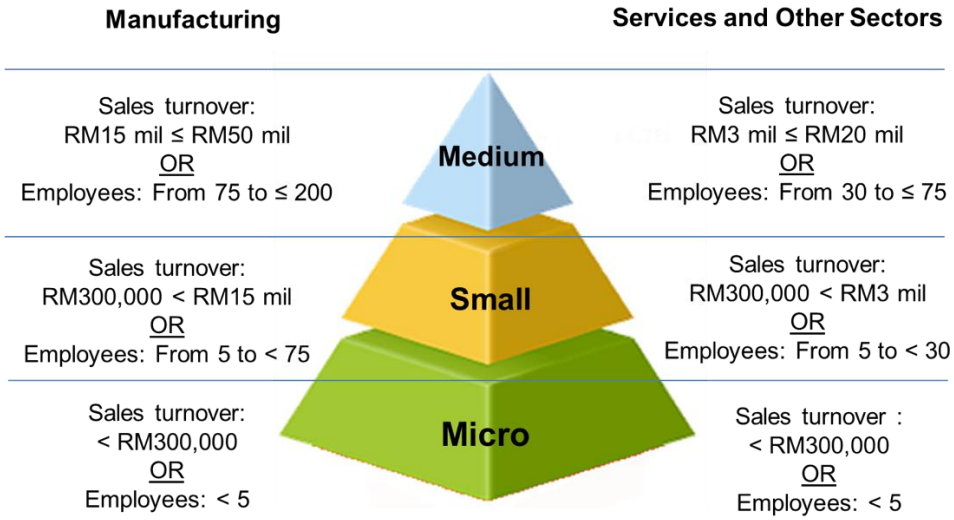
innovation and technology adoption (SME Corporation Malaysia, 2023). However, despite all the support mechanisms offered, limited study has yet to examine their effectiveness in enhancing SMEs' business performance. Thus, to address this gap, this paper will seek to provide an overview of the government support mechanisms such as financial support and business support (non-financial support) within EEs and how it can impact the SME's business performance in Selangor, Malaysia. Despite all studies done previously, there is still a lack of evidence on the relationship between government support and SME's performance in Selangor, Malaysia. Next, this paper will discuss the types of government support, SMEs in Malaysia and the impact on SMEs performance. This paper will add more to the literature review, particularly on government support within EEs and the impacts on SMEs and this work emphasizes interesting venues for future research. Lastly, this study will give valuable insights to policymakers and stakeholders to further design effective policies and strategies for SMEs.

2. Literature Review

SMEs in Malaysia

SMEs exhibit distinct traits including the ability to adapt and be agile in navigating dynamic situations, as well as possessing specialized competencies and limited resources (Silva, González-Loureiro, & Braga, 2021). According to Costa Melo, Queiroz, Junior, Sousa, Yushimito & Pereira (2023), two criteria are used to define the SMEs; sales turnover and number of full-time employees.

Figure 1: Source from SME Corporation.



According to SMEs Corporation Malaysia, SMEs are divided into three (3) three groups: micro enterprises (69.7%), small enterprises (28.5.%) and medium enterprises (1.8%) (SME Corp, 2023) and categorized into several categories such as services, manufacturing, agriculture, construction, and mining & quarrying. SMEs in the manufacturing industry are classified as companies whose annual revenue is below RM50 million or have a workforce of no more than 200 full-time employees meanwhile service and other sectors are identified as businesses that either have an annual revenue of RM20 million or less or employ no more than 75 full-time workers. In 2023, 1, 101, 725 SME establishments were recorded indicating an average annual growth rate of 5% between 2022 and 2023 (Annual report SME Corp, 2023). This definition is summarized in illustration 1.

Entrepreneurial Ecosystem (EE)

The concept of the entrepreneurial ecosystem (EE) has gained significant recognition and evolved in recent years. Cohen (2006) defines an entrepreneurial ecosystem as a connected network of individuals within a local geographical community who are addicted to promoting sustainable development by supporting and facilitating the establishment of new ventures. Subsequently, Isenberg's (2010) influential publication, followed by Feld's (2012), contributed to a significant role in fueling the increasing popularity of the ecosystem concept and gained attention among both policy practitioners and academics. This definition of an EE, as stated

by Stam (2015), has gained recognition and support from scholars, including Acs, Estrin, Mickiewicz & Szerb (2018). Acs et al., (2018) describe EEs as biotic communities encompassing the physical environment and its various interactions. Meanwhile, Van Rijnsoever (2020) views EE as a network of actors that collaborate and exchange resources under an institutional framework and infrastructure. In summary, EEs are characterized by their complexity, dynamic nature, constantly evolving, and operation in a holistic manner to describe the level and condition of entrepreneurship (Cohen, 2006; Shi and Shi, 2022).

Understanding and valuing the EEs is now widely acknowledged as a crucial approach for fostering economic growth. Supportive EEs are significant contributors in generating employment opportunities, nurturing wealth creation and economic prosperity (Malecki, 2018), thriving on innovations (Shami, Mamun, Safiah & Nurulizwa, 2020) and the application of new technologies, and lastly, gaining competitive advantage in the global economy. According to Weerasekara and Bhanugopan (2023), quality EEs require commitment, dedication, and connection among the EEs components. EEs perform as a foundation structure that supports entrepreneurial activities in specific geographical areas. Prior research founded common EE components categories into the following six (6) components; policy, finance, culture, human capital, market and support (Isenberg, 2011, Stam, 2015; Spigel, 2017) and each of these components is interconnected and their actions may influence the performances of each other (Stam & Van de ven, 2021; Tekic & Kurnosova, 2024).

Support Mechanisms for SMEs by Government and Agencies.

Many countries realized the contribution of SMEs to economic growth and development (Pulka, *et al*., 2021). SMEs assist in the job creation, growth of GDP and export earnings. Latest statistics from the Department of Statistics Malaysia 2023, SMEs GDP generated RM707.6 billion in 2023. All five sectors in SMEs (services, manufacturing, agriculture, construction, and mining & quarrying) significantly contribute to the GDP in 2023 whereby the service and manufacturing sectors highly contribute to the total SMEs' GDP (84.8%). SMEs' GDP grew by 5% as opposed to the country's overall GDP of 3.6%. SMEs also contribute to 39.1% in 2023 from 38.4% in 2022 (Department of Statistics Malaysia, 2023). Considering the contributions and importance of SMEs in Malaysia, the Malaysian government continuously developed and offered various support mechanisms to SMEs through the ministry, state governments and agencies. These support mechanisms can be categorized into two (2) key elements: (1) financial opportunities (2) business supports such as incubators and accelerators, training and mentorships and networking opportunities.

Financial Supports: Government financial support is one of the components that can boost the SME's performance and contribute to the economy (Jayeola, Sidek, Rahman, Mahomed & Hu, 2022). A study done by Cheong, Lee & Weissmann (2020) provides evidence government support particularly credit access and tax structure positively affect SME performance. In Malaysia, for instance, the government offers various funding opportunities to assist entrepreneurs in their businesses. For example, Budget 2023: Building a Civilized Malaysia allocates funds totaling RM40 billion to provide financial facilities and financing guarantees for the benefit of SMEs (MEDC, 2023). In addition, MEDC also offers a variety of funding sources to entrepreneurs under their agencies; (1)Tekun Nasional such as Business TEKUN Financing Scheme, TEKUN Friends Funding Scheme, and Indian Community Entrepreneur Development Scheme (SPUMI). All these funding schemes provide financing facilities to assist the entrepreneur get funding from RM1000 up to RM100,000 with a repayment period of up to 10 years. (2) National Corporation Limited provides a Franchise Financing Scheme, Pre-Franchise BIT Financing Scheme, Women's Franchise Entrepreneurship Financing Scheme (SWEET) and Youth Franchise Entrepreneurship Financing Scheme (YOUNITY) to entrepreneurs that embark on the franchise industry. (3) Malaysia Effort Trust (Amanah Ikhtiar Malaysia) also provides business capital to entrepreneurs such as the I-Young Scheme, the i-Friendly Scheme, and i- the Heroine Scheme. These schemes offer funding for Malaysian entrepreneurs from RM5000 to RM30 000 with a repayment period of up to 2 years (MEDC, 2023).

Furthermore, other ministry such as the Ministry of Rural and Regional Development (MRRD) offers many financing and training programs such as Right Start Program (PSR), Rural Economy Financing Scheme (SPED), Rural Entrepreneurship Strengthening Support Program (SPKLB), Income Enhancement Program and Desamall Online. RM 90.81 million has been allocated for rural economic endeavors that include a range of initiatives including community economic development programs and entrepreneurship projects with a specific emphasis on promoting the digitalization of business (under the Budget 2023: Building a Civilized

Malaysia). MRRD has allocated RM1.7 million in 2023 to support the Entrepreneur Digitization Program (Desamall Online), aiming to assist 1000 entrepreneurs in digitizing their businesses (MRRD,2023). These funding sources allow entrepreneurs to secure capital and sustain their business in the industry. This paper summarizes the current financial opportunities available for SMEs in Table 1. By leveraging these mechanisms effectively, entrepreneurs can enhance their chances of growth and success by minimizing the challenge and increasing access to resources. A study done by A study done by Cheong et.al., (2020) proved that credit has a positive correlation with SME performance and attracts investors. Tehseen, Johara, Halbusi, Islam & Fattah (2021), further found SMEs' performance is reflected by financial support. However, empirical studies done by various studies argue government financial supports have no significant effects on SMEs performance (e.g. Luo, Liu, Zhang, Xu & Guo, 2021; Wang et al., 2021; Zulu-Chisanga, Chabala & Mandawa-Bray, 2020). Similarly, studies in Korea's SME foods industry also present government support does not affect SME performance. (Jeong et al., 2021). Therefore, this study proposes the following hypothesis to examine the relationship between financial support and SMEs' business performance.

H1: Government financial support has a positive effect on the SME's business performance.

Table 1: Financial opportunities available for SMEs in Malaysia year 2023

Sector	Initiatives	Ministry/Government Agencies
Manufacturing and services	1. Business TEKUN Financing Scheme, 2. TEKUN Friends Funding Scheme 3. Indian Community Entrepreneur Development Scheme (SPUMI).	1. Tekun Nasional
	2. Tube Grant for start-up venture (Youth Bumiputera).	2. SME Corp
	3. Franchise Financing Scheme, 4. Pre-Franchise BIT Financing Scheme, 5. Women's Franchise Entrepreneurship Financing Scheme (SWEET) 6. Youth Franchise Entrepreneurship Financing Scheme (YOUNITY).	3. National Corporation Limited
	7. I-Young Scheme, 8. i-Friendly Scheme 9. i- Heroine Scheme. 10. Right Start Program (PSR), 11. Rural Economy Financing Scheme (SPED), 12. Rural Entrepreneurship Strengthening Support Program (SPKLB) 13. Income Enhancement Program and Desamall Online.	4. Malaysia Effort Trust (Amanah Ikhtiar Malaysia) 5. Ministry of Rural and Regional Development (MRRD)

Business Support: Prior studies have found that business support positively affects SME business performance. For instance, in Nigeria, government support is a key player in contributing to the competencies, capability and competitiveness of SMEs (Shamsuddin, Management, Idrus, Islam, Maulana & Ibrahim (2020). Further, a study in South Africa indicated that incubators/accelerators and training assist SMEs in enhancing their performance (Kanayo, Maria, & Ebenezer, 2023). Similarly, Poland, the Czech Republic, Hungary, and Slovakia benefit significantly from the incubator programs that focus on improving product quality and innovation capabilities (Siwiec, 2023). According to Nguyen & Vu (2021), non-financial support such as training and advisory services are as important as financial support.

Incubators and accelerators play an important role in connecting entrepreneurs with industry experts,

enabling resource exchange and thus offering guidance and support to entrepreneurs Cearra, Saiz-Santos & Barrutia, 2021; Hern´andez-Chea, Mahdad, Minh, Hjortsø, 2021). Entrepreneurs may benefit from the incubator programs whereby the knowledge they gain will assist them in creating new opportunities, combating challenges and seeking solutions (Tabas, Kansheba & Theodoraki, 2024). Moreover, these programs not only assist SMEs during their crucial early stages but also nurture innovation and diversification, create employment opportunities and enhance entrepreneurial competencies (Al-Baimani, Clifton, Jones & Pugh, 2021). According to Harris (2021), incubators are a transformation agency in the EEs. Business incubators are characterized as property-based organizations that foster the expansion of entrepreneurial companies (Tracey, Dalpiaz, & Phillips, 2018; Nixon & Valliere, 2021) and serve as orchestrators of EE (Del Sarto, Isabelle, & Di Minin, 2020; Giudici Giudici, Reinmoeller & Ravasi, 2018), These property-based organizations provide a pool of resources, encouraging interactions among entrepreneurs to develop skills, and tying entrepreneurial ventures to the external business community.

Meanwhile, an accelerator is "a fixed-term, cohort-based program for startups, including mentorships, and/ or educational components, that culminates in a graduation event (Cohen, Fehder, Hochberg & Murray, 2019). By joining accelerator programs, entrepreneurs, especially startups, may gain various benefits such as enhancing their innovation performance (Del Sarto et al., 2022) access to resources and networks, fast-track developments, enhanced credibility and visibility within the industry and among potential investors and gaining structured learning and mentorship (Klerk, Miles, & Bliemel, 2024). In Malaysia, the Ministry of Science, Technology, and Innovation (MOSTI) known as MaGIC (Malaysian Global Innovation & Creativity Centre) offers pre-accelerator, and accelerator programs as well as valuable resources to support startups and entrepreneurs at various phases of their journey. This incubator's primary objective revolves around cultivating a vibrant EE in Malaysia (MaGIC, 2023). Another incubator, Selangor Information Technology & Digital Economy Corporation (Sidec), one of the Selangor government agencies also assists start-ups, provides mentoring, and training, and connects entrepreneurs to a network (Sidec, 2023).

The Ministry of Entrepreneur Development and Co-Operative (MEDC) together with agencies such as SME Corporation Malaysia and the Institute of National Entrepreneurship (INSKEN), has developed and executed various initiatives, programs, training, mentoring, and support to achieve the aspirations as Entrepreneurial nation by 2030. Programs conducted by SME Corp including MSME Week 2023, Global Linkages SME Program (GLOSMEP), SME Annual Showcase (SMIDEX) and SMEs Export Enhancement Program provide a platform for fostering networking and collaboration. These opportunities allow the entrepreneur to exhibit their products and services, share their knowledge, establish strategic business partnerships and create new business linkages and investment opportunities. Therefore, this study proposes the following hypothesis for the study of SMEs in Selangor, Malaysia.
H2: Government business support mechanisms have a positive effect on the SME's business performance.

Impact of Government Supports and SMEs' Business Performance: Hussaini and Muhammed (2018) described business performance as the capacity of firms to gain opportunities and encounter challenges by operating firms efficiently and profitably. To increase business performance, developing the right business strategies is essential and interconnected (Kadak & Laitinen, 2021) therefore the performance measurement must be aligned with the business strategies (Hansen, 2021). Business performance can be measured by assessing a firm's financial performance, innovation performance and market performance (Santos & Brito, 2012).

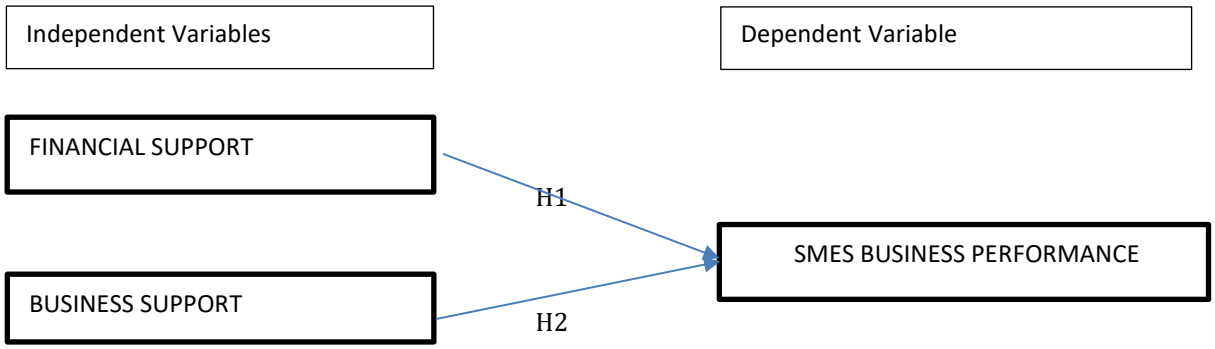
Adequate funding is important for entrepreneurs to start and grow in their journey. Government financial support is a crucial factor for SMEs in developing countries to overcome resource insufficiency meanwhile in advanced economies countries, the government provides a conducive environment to nurture entrepreneurial activities (Tekic & Kurnosova, 2024). This aligned with findings from Cheong et al., (2020) who suggest new initiatives and programs that offer non-debt funding should be introduced to improve the SME's performance. Past studies for instance studies done by Park, Lee & Kim (2020) and Aslam, Rehman & Nasir (2023) showed that government financial support played a crucial role in SMEs' performance and thus resulted in SMEs' sustainability. A study done by Kanayo et al., (2023) and Yusoff, Zainol, Kasuma, and Darma, (2021) among SMEs in South Africa and Malaysia respectively confirmed that government financial support contributes positively to SMEs' business performance. Subsidies, grants, and tax incentives received by SMEs in Malaysia

significantly impact the growth of SMEs (Kamilah & Kassim, 2021).

In SMEs, innovation is also critical for survival, and competitiveness and creates competitive advantages (Khan, Thuy & Tram, 2023; Marzi, Manesh, Caputo, Pellegrini & Vla, 2023; Severo, Sbardelotto, de Guimarães & Vasconcelos, 2020). Creativity and innovative ideas are needed for SMEs to produce the quality, values, and effectiveness of their businesses (Feng, Zhenzhen & Wang, 2022). Various studies demonstrated the positive correlations between government support and SME business performance (Chen, Amoako, Quansah, Danso & Jidda, 2023; Khan et al., 2023). However, SMEs have limited access to invest in innovation due to limited resources on finance. For instance, a survey done by SME Bank (2020) found that one of the main obstacles to SMEs is funding. The financial products offered by financial institutions did not fulfill entrepreneurs' demands due to high financing charges and low funding amounts. Hence, government support mechanisms such as tax incentives, subsidies, and technical support are critical to SMEs then spur innovation in firms leading to higher business performance (Chen et al., 2023; Songling, Ishtiag, Anwar & Ahmed, 2018). Lastly, by having positive government support, SMEs can enhance their relationships with the state entities thus increasing access to design unique policies and financial assistance. SMEs have the potential to boost their market performance when they can explore opportunities to design unique policies and financial assistance from effective government support (Nor et. al., 2023; Zaato, Ismail, Uthamaputhran, & Owusu-Ansah, 2020).

Integrating the proposed hypothesis, this study developed the following conceptual framework for further analysis.

Figure 1: Conceptual model: the impact of the entrepreneurial ecosystem (Government support) on the Business Performance of SMEs in Selangor, Malaysia.



Source: Own elaboration.

3. Research Methodology

This study will adopt a cross-sectional design and the target population will be SMEs in Selangor, Malaysia. Moreover, a quantitative research method will be applied to examine the impact of government support on SMEs. Selangor will be selected as an area of study because the area is the most developed state that contribute almost a quarter (25.9%) contribution to the National GDP in 2023 (DOSM, 2023). Therefore, it is crucial to understand the impact of government support on SME performance in Selangor, Malaysia. Convenience sampling will be used in selecting the SMEs to take part in this study. The survey will be used by focusing on government support mechanisms; financial support (funding opportunities) and business support (networking and collaboration, incubators and accelerators). The survey will also collect data on the performance of SMEs. This study will measure SMEs' business performance inspired by the works of Santos and Brito (2012). Meanwhile, all the items for the availability of government financial support will be adopted from Acs, Szerb and Autio (2015).

Table 2: Sources of Variable

Variables	Items	Sources
Government Support		
Financial Support	12	Acs, Szerb and Autio (2015).
Business Support	13	Shamsuddin (2014)
SMEs Performance	16	Santos & Brito (2012)

SPSS and SEM will be used to analyze the data. In early analysis, reliability analysis will be conducted to assess the internal consistency of the measurement scales for instance, Cronbach's alpha will indicate if those questions are reliably measuring the same underlying concept before examining relationship factors. Next, this study will incorporate the exploratory factor analysis (EFA) to identify underlying factors influencing SME performance that might be related to government support. EFA can reveal if these measures group together into broader factors such as financial performance or innovation performance. SPSS and SEM will be considered to test complex relationships between variables and further assist in examining how different government support programs may directly or indirectly influence SME performance factors in Selangor. Hence, the findings of this study will provide a comprehensive understanding of how government support has an impact on the performance of SMEs in Selangor, Malaysia.

4. Conclusion

The impact of government support within EEs has gained significant attention in academic research. Government support is essential in SMEs' performance and the effectiveness of such support often depends on various factors such as the nature of industries and the size of the firms. By providing financial support, SMEs can improve their accessibility to capital and resources resulting to increasing in performance Anwar & Li, 2021). However, the effectiveness of government financial support is not universally positive. Zulu-Chisanga et al., (2020) and Jeong et al., (2021) studies indicate that government financial support may not have a direct impact on SME performance and suggest other factors such as inter-firm collaboration and managerial ties are crucial for enhancing the impact of government support. This further emphasizes that in certain circumstances, government financial support may not have a significant impact on SME performance. Meanwhile, business supports such as incubators and accelerators, networking and collaborations, and training are also vital for SME performance. Government business support may assist SMEs in increasing their short-term performance by reducing debts and increasing sales (Kim et.al., 2021). Therefore, the purpose of this paper is to advance the literature review on government support within EEs and also this work emphasizes interesting venues for future research. First, how does government support affect SMEs' performances? and how effectively does each government support affect SMEs' performance?

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Manual Madness: Challenges of Contract Renewal in Campus Vending Machine Business

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Abstract: The vending machine industry has evolved from conventional to connected machines. Vending machines are currently in wide use and typically involve a remote machine holding a plurality of products or items to be dispensed after receiving money from a purchaser. The industry has gone beyond just delivering snacks and is developing new and sophisticated retail solutions for both large and small companies. In this study, a qualitative inquiry was conducted in one of the branch universities of the largest public universities in Malaysia. A total of three vending machine entrepreneurs were qualitatively interviewed individually. Interviews were transcribed and analyzed to find a common theme. As a result, three challenges were identified: using a lot of paper, being time-consuming, and having no alert process. Contract renewal is significant and should not be taken for granted and it is a far-sighted move for a business manager to use the most efficient process from start to end. The respondent agreed that the current renewal process is redundant and time-consuming. Therefore, the researchers proposed to all the parties to reduce the hassle of renewing the contract. Based on this research, the authority department in public or private universities can develop an innovation in monitoring systems to improve the process. The results can provide suitable coping strategies for business owners to have the best practices for a contract renewal mechanism.

Keywords: *Business Contract, Vending Machine, Challenges, Entrepreneur*

1. Introduction and Background

The vending machine business is a subset of the retail industry. It represents a specific channel through which products are distributed and sold to consumers. Vending machines are currently in wide use and typically involve a remote machine holding a plurality of products or items to be dispensed after receiving money from a purchaser. Vending machines are one of the alternative ways for university students, staff and visitors to get food, drink and snacks. With their high demand, vending machines have become a widespread investment in universities. These readily accessible machines not only provide a steady source of revenue for educational institutions, but they also conveniently meet the needs of customers at all hours of the day. A control system integrates electrical and mechanical components to power machines that include payment processing, user interface, product delivery, and communication features (Sibanda et al., 2020). By integrating these functions into a centralized control system, the machine can operate efficiently and effectively, providing a reliable and convenient experience for users.

Despite vending machines' potential profitability and convenience, the industry also faces challenges. Factors such as location, product selection, maintenance, and competition can significantly impact the success of a vending machine business. Additionally, the rising costs of raw materials, energy, and labor can affect operating expenses. To thrive in this competitive market, vending machine operators must continually analyze consumer trends, adapt to technological advancements, and implement effective marketing strategies to attract and retain customers. The vending machine business industry might not be a primary focus of academic research in Malaysia. Most previous research on vending machines involved technology and health-related aspects (Kung-Jeng & Natalia, 2024, Hasan et al., 2021, Viana et al, 2018). However, there is a need to understand the scenario that happens in this industry from a business perspective. This research's result would help Malaysian vending machine entrepreneurs manage and renew contracts with business location owners efficiently. Furthermore, the results can provide suitable coping strategies for business owners to have the best practices.

2. Literature Review

The vending machine is well known by everyone as it is a medium or technology that dispenses items such as foods, drinks, newspapers, and others where the user needs to insert coins or tokens for the items to be dispensed (Breed, Garcia & Cushing, 2018). Nowadays, vending machines have been widely used all over the world especially for foods and beverages because of the availability of vending machines in a multitude of locations, which are at workplaces, schools, universities, healthcare facilities and other public areas (Matthews & Horacek, 2015; Grech & Allman-Farinelli, 2015, as cited in Rosi et al., 2017). Escoto et al. (2010) mentioned that vending machines have saved people time because it is one of the primary and most readily accessible technology sources of food to purchase main meals or snacks, especially for people working for a long period (as cited in Rosi et al., 2017). The vending machine industry has evolved from traditional machines to connected machines. The industry has gone beyond just delivering snacks and is developing new and sophisticated retail solutions. Connected vending machines, unlike conventional machines, engage shoppers like never before with touch-screen controls, audio, video, scents, gesture-based interaction, and cashless payment.

There are almost 14.5 million vending machines worldwide, and many vending entrepreneurs are now considering adding connectivity (Berg Insight, 2023). Connected vending machines are conventional vending machines equipped with internet connectivity. Berg Insight, an independent industry analyst and consulting firm based in Sweden forecasts that the number of connected vending machines worldwide will grow from 5.8 million units in 2022 to 12.3 million units by 2027. Japan is widely recognized as the country with the highest density of vending machines globally. According to the Japan Vending System Manufacturers Association (2024), there were 3,931,900 vending machines in Japan as of December 2023 including beverage, food, cigarette, ticket, daily necessities, and automatic service machine categories. While the vending machine industry is growing in Malaysia, there is no exact number of vending machines as no centralized authority tracks the number of them.

Running a vending machine business involves not only the revenue generated but also the expenditures incurred such as the initial purchase or lease of the machine, inventory to stock it and any licensing or permits required to operate it (Global Sources, 2024). Vending machine entrepreneurs require a permit or agreement to place a vending machine on someone's property. This protects the property owner and ensures the vending machine is operated responsibly. For public university property, there is a written agreement between vending machine entrepreneurs and university authorities. There is a certain period for this agreement, and it needs to be renewed. Industry Relation, Community, Alumni and Entrepreneurship Division (iCARE) was in charge of entrepreneurship and business space in this branch university campus (UiTM Cawangan Selangor, 2024). Some vending machine entrepreneurs will partner with student societies to manage these businesses.

Dealing with contracts is among the most common business practices for both large and small companies. Contractual relationships are usually with consumers of goods and services, including people who borrow money and those who enter into franchise and rental agreements. Contracts can either be verbal or written and sometimes it can be a combination of both. Finance agreements and real estate selling or buying should always be in writing. For a contract to be legal, an agreement will form when one party proposes specific terms, and another party agrees to these terms (Rachel and Simon, 2014).

The current monitoring system is done manually and there is no specific structure for a contract. However, generally, it follows a structure that entails details concerning the parties to the contract as well as any arrangements they have for sub-contracting. Some of the other items include the duration of the contract, definitions of, and description of the goods or services, and payment details, which consist of the interest to be paid in case of late payments. There should also be key milestones and dates, required indemnity and insurance provisions, and guarantee provisions, including the guarantees of the director. Contracts also include penalty or damage provisions, renewal or renegotiation options, disputes and complaints resolution processes, termination conditions and special conditions. People also sign contracts with suppliers as well. Once this agreement term ends, it needs to be renewed. A business venture needs to ensure that it renews its contract to ensure all its obligations with its customers, suppliers, service providers and other entities are legally protected.

Most contracts include a provision for contract renewal. Although most renewals go smoothly, sometimes issues arise that the involved parties may need to iron out. One way to ensure that there are no issues before the contract renewal is to use good contract management software that manages contracts from the initial stage to the renewal stage.

3. Research Methodology

A qualitative study was conducted in one of the branch universities for the largest public universities in Malaysia. The qualitative study applied semi-structured interviews among vending machine entrepreneurs. The study population was all vending machine entrepreneurs registered with the Industry Relation, Community, Alumni and Entrepreneurship Division (iCARE). Consented participants were purposely selected from among individuals directly involved in the contract renewal process. Three people representing vending machine entrepreneurs were interviewed in Malay and translated into English. Respondents could express their experiences, thoughts, and feelings regarding the current contract renewal process. In this study, all interviews were recorded by video camera. Interviews were also transcribed and analyzed to find a common theme.

Researchers use a purposive sampling strategy where participants are selected based on specific criteria that are relevant to the research question. In this study, the criteria are related to the involvement of the vending machine entrepreneurs in the vending machine business and their relationship with the university and student society. According to Table 1, only entrepreneurs who registered with iCARE, are involved with the contract renewal process, have at least more than 5 vending machines and joint venture business with student society was selected as this study aimed at exploring the unique challenges.

Table 1: Vending Machine Entrepreneurs Screening

Identification	Registered with the Industry Relation, Community, Alumni and Entrepreneurship Division (iCARE), and university campus bursary n = 30
Screening	Involved with the contract renewal process n = 15
Eligibility	Have at least more than 5 vending machines n = 8
Included	Joint venture business with the student society n= 3

4. Findings

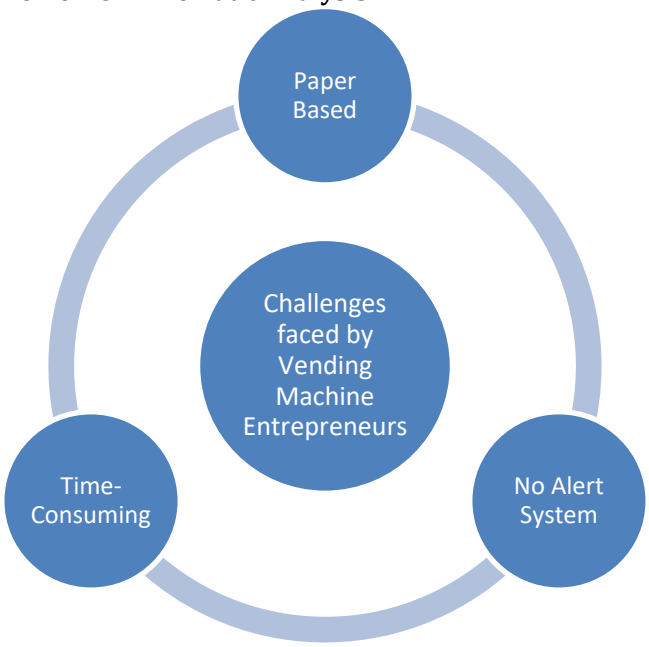
A summary of demographic and business-related information about three respondents involved in the vending machine business is shown in Table 2. Based on the interview results, the study has identified several vending machine monitoring challenges, such as the use of a lot of paper, being time-consuming, and not having an alert process. It takes almost one month for vendors to renew business space without a contract.

Table 2: Respondent's Information

No	Code	Gender	Number of Vending Machine	Experiences with Vending Machine Business
1	R1	Male	20	5 years
2	R2	Male	11	3 years
3	R3	Female	5	1 year

Thematic analysis of the transcriptions of the interviews yields three emerging themes: paper-based, time-consuming, and no alert system, as shown in Figure 1.

Figure 1: Emerging Theme from Thematic Analysis



Paper-based

A paper-based business renewal process is often characterized by inefficiency, delays, and a high potential for errors. A completed form, along with supporting documents such as receipts is physically submitted to iCARE. Paper consumption is associated with waste, contributing to environmental concerns.

"Every three months, I need to fill up a form to renew the contract" (R1)

"There are a lot of processes involving renewal process, preparing the document, payment receipt and others. All this process involves the use of paper." (R2)

The business renewal process is characterized by excessive paperwork and frequent repetitions. Respondents indicated that the renewal process requires the completion of forms every three months (R1). Additionally, the process involves preparing various documents, including payment receipts, which contributes to a significant paper trail (R2). This paper-based system is likely to be inefficient, time-consuming and prone to errors.

Time-Consuming

Business renewal processes can be notoriously time-consuming. Applications are reviewed by relevant departments, often involving multiple steps and approvals.

"It takes almost one month to receive the approval letter, and the contract needs to be renewed every three months. Sometimes I make a one-time payment for a one-year duration business contract". (R1)

"All the entrepreneurs need to come to the office to collect the offer letter, submit the form and receipt of payment. We need to update the Department of Entrepreneurship and Bursary for the same process". (R2)

"There are a lot of student society and vending machine entrepreneurs that have business contracts with the Department of Entrepreneurship. It takes time to prepare our document". (R3)

The business renewal process is characterized by significant delays and complexities. Respondents reported that it takes approximately one month to receive approval letters for contract renewals, despite the contracts needing to be renewed every three months (R1). This discrepancy highlights a substantial delay in the process. Furthermore, the process involves multiple stages, including collecting offer letters, submitting forms and

payment receipts, and coordinating with different departments (R2). The number of entrepreneurs involved, particularly student societies and vending machine operators, adds to the complexity of the process, as evidenced by the time required to prepare necessary documents (R3).

No Alert System

An effective alert system in a business renewal process ensures timely actions, minimizes risks and optimizes efficiency. A general notification system is required to alert the vending machine entrepreneurs and stakeholders based on their roles and responsibilities. By carefully designing and implementing an alert system with another business system it can provide seamless data flow for licenses nearing expiration, renewal approval documentation, and compliance issues.

"I always received reminders by the student society representative to make a payment" (R1)

"Sometimes other entrepreneurs and myself forget about the status of payment because there are too many vending machines on the campus" (R3)

The current system needs more effective communication and tracking mechanisms for payment reminders and status updates. Respondents highlighted the challenge of remembering payment due dates for multiple vending machine entrepreneurs (R1). Additionally, the large number of vending machines on campus contributes to difficulties in tracking payment statuses, leading to instances of forgotten payments (R3). This indicates a need for a more robust system to manage payment reminders and track payment statuses.

Discussion

The study aims to identify the challenges of contract renewal in the campus vending machine business. The thematic analysis of the interview transcripts has unveiled three core issues within the business renewal process: paper-based operations, time-consuming procedures, and the absence of an alert system. These interconnected challenges collectively hinder the efficiency and effectiveness of the process, as evidenced by the participants' experiences. Paper-based operations are a significant contributor to the overall inefficiency. The reliance on physical forms and documents creates a cumbersome and error-prone system (Feyen et al., 2021). Manual data entry, storage, and retrieval are time-consuming, and the risk of lost or damaged documents is high. Moreover, the environmental impact of excessive paper consumption must be addressed. The transition to a digital system could streamline processes, reduce errors, and promote sustainability (Elgammal et al., 2014).

The time-consuming nature of the business renewal process is another critical concern. Multiple steps, approvals, and physical submissions create delays that frustrate both entrepreneurs and administrators. The lengthy process may deter potential entrepreneurs and hinder the growth of existing businesses. Implementing online applications and automated workflows could significantly reduce processing time and improve overall satisfaction (Gavrila et al., 2023). An alert system needs to improve the challenges associated with the renewal process. Entrepreneurs may miss important deadlines without timely notifications, leading to penalties or disruptions in their business operations. The notification system sends reminders of planned tasks nearing their due date to respective stakeholders (Alsaeedi et al., 2022). By integrating notifications with other business systems, relevant stakeholders can be kept informed about key milestones, such as approaching deadlines or required actions.

5. Managerial Implications and Recommendations

Vending machine businesses also have received government support. In February 2023, the Economy Minister, Rafizi Ramli, launched the People's Income Initiative (IPR) to uplift the impoverished and B40 group (Ministry of Finance Malaysia, 2023). This initiative, aligned with the 12th Malaysia Plan's Food Entrepreneur Initiative (INSAN), involves government, community, and strategic partners. By providing vending machines to eligible individuals, the IPR aims to create sustainable income sources and contribute to eradicating hardcore poverty. This government-backed initiative has shown potential in empowering marginalized communities through entrepreneurship. By providing a platform for individuals to generate income, vending machines have become a tool for economic upliftment (Ministry of Finance Malaysia, 2023). However, challenges such as product

selection, maintenance, and competition need to be addressed to ensure the long-term sustainability of these vending machine businesses (Ahmed, Ahmed, & Salman, 2005).

Overall, the study highlights the need for improvements in the contract renewal process for campus vending machine businesses. By addressing the identified challenges, stakeholders can enhance efficiency, reduce costs, and support the growth of this sector. The findings also emphasize the potential of vending machines as a tool for economic upliftment, particularly when coupled with appropriate government support. However, the findings may not be generalizable to a larger population of vending machine entrepreneurs involved in the vending machine business due to the limitation of the small size of this study. In the future, the researchers will consider using a larger sample size, and employ rigorous methods to minimize bias for generalizing the findings.

Conclusion

The identified issues of paper-based operations, time-consuming procedures, and the absence of an alert system collectively impede the efficiency and effectiveness of the business renewal process. Addressing these challenges through digital transformation and the implementation of a robust alert system is essential to create a streamlined, user-friendly, and environmentally responsible process. Contract renewals are significant and should not be taken for granted and it is a far-sighted move for a business manager to use the most efficient process from start to end. Based on this study, the authority department in public or private universities can develop an innovation in monitoring systems to improve the business process. All the participants agree to have a good monitoring system to ease the process of renewal contracts. In the future, entrepreneurs will have to subscribe to this system for swift business applications and business contract renewals. This study contributes to the understanding of the vending machine industry in Malaysia and provides valuable insights for businesses and policymakers.

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The Impact of Visual Stimuli on Online Shopper's Emotion: Applying S-O-R Theory in Online Fashion Retail

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Abstract: This study investigates the impact of visual stimuli on consumer emotions and purchase behaviour in online shopping environments, using the Pleasure, Arousal, and Dominance (P-A-D) model as a theoretical framework. It investigates how visual aspects, including website aesthetics, product photography, and design complexity, influence consumer pleasure, arousal, and dominance, ultimately influencing purchase intentions. Visually appealing and well-planned visual material makes consumers feel better, increasing engagement and the likelihood of purchasing. Furthermore, it discovers that increased arousal can lead to impulsive purchasing behaviours, yet a sense of power or control increases consumer confidence and satisfaction. The study emphasises the necessity of combining visual and experiential aspects to create immersive online buying experiences. Theoretical implications recommend a more in-depth analysis of the P-A-D model's applicability in e-commerce. In contrast, managerial implications assert visual design optimisation to improve consumer interactions and sales.

Keywords: *Online fashion retail, visual stimuli, S-O-R theory, P-A-D model*

1. Introduction

In the rapidly evolving world of online fashion retail, understanding the customer journey is vital for achieving success. This journey encompasses the various touchpoints and experiences consumers encounter, from their initial engagement with a brand to the final purchase. Tan (2024) shows that customer engagement is significantly enhanced when fashion retail websites offer informative content, leading to more significant interaction and loyalty. Additionally, customer experience is crucial in shaping traditional and electronic word-of-mouth, particularly in fast-fashion retail (Anggraeni & Dhillon, 2022). As online shopping becomes increasingly dominant, especially after the COVID-19 pandemic, fashion retailers must strategically adapt to maintain relevance. Integrating physical and online stores through omnichannel strategies has emerged as a critical approach, creating a seamless customer journey that blurs the lines between shopping channels (Mahyadin@Mahidin, 2024).

Malaysia's online fashion retail business has increased, owing primarily to the COVID-19 epidemic, which has pushed e-commerce trends. Increased internet penetration, rising disposable incomes, and altering consumer behaviour contribute to this trend, with more consumers choosing online purchasing for convenience and security (Shaari et al., 2022; Mohamad, 2023; Moorthy et al., 2023). Customers' inclination for platforms that provide a seamless purchasing experience and lower the perceived dangers of online transactions has resulted in a notable increase in consumer participation in Malaysia's fashion e-commerce sector (Hong et al., 2019; Zin, 2023). Despite these positive trends, challenges remain, particularly in terms of consumer trust in personal information security and the credibility of online retailers (Hong et al., 2019; Tham et al., 2019). Some customer segments face additional hurdles to online shopping adoption, which must be addressed for long-term growth (Naseri et al., 2020).

Online fashion retail, which includes the sale of apparel, accessories, and related products via digital platforms, is gaining popularity due to its convenience, accessibility, and broad offerings. Retailers employ e-commerce websites, mobile applications, and social media to promote products and ease transactions, with features like virtual fitting rooms and personalised recommendations to improve the shopping experience. Technological developments, altering customer preferences, and the influence of e-commerce companies such as Amazon and Alibaba have all contributed to the industry's growth. As the industry evolves, innovations such as artificial

intelligence for personalised shopping and augmented reality for virtual try-ons will likely shape future growth. The successful integration of online and offline channels will be critical to delivering a customer-centric purchasing experience (Shaari et al., 2022; Hong et al., 2019).

Moreover, Siregar et al. (2023) described the rise of social media and online resale platforms, particularly among Gen Z consumers, as reshaping fashion consumption, compelling retailers to engage in these digital spaces. To enhance customer satisfaction and drive sales, online fashion retailers must identify and prioritise factors that align with consumer preferences (Morsi, 2023). Artificial intelligence has proven effective in optimising the customer experience across different journey stages (Sasanuma, 2024). Furthermore, emerging technologies like augmented and virtual reality offer new opportunities for experiential retailing, enabling fashion retailers to create immersive online shopping experiences (Hilken et al., 2021). As the e-servicescape, customer experience, and perceived value in online shopping apps continue to influence consumer behaviour, understanding and optimising the customer journey remains a critical focus for online fashion retailers (Patel, 2023; Poorrezaei et al., 2023). E-servicescape refers to an online environment that describes how customers feel when they visit a website, similar to how they feel when visiting a physical store (Koering, 2003).

Many retailers need help to influence consumer behaviour using visual stimuli effectively. This challenge derives from the complexities of consumer perceptions within the dynamic retail environment and the uneven success of visual merchandising methods. Not all tactics achieve the desired effects, such as the effectiveness of visual merchandising, which is determined by the consumer's emotional and psychological orientation (Susanto & Adiwijaya, 2023). Retailers must customise their visual tactics to meet the preferences of their target audience. Besides that, combining many sensory stimuli, such as audio and visual signals, complicates the process, emphasising the importance of providing a cohesive sensory experience that resonates with customers (Li & Pan, 2023). In consumer behaviour research, the stimulus-organism-response (S-O-R) theory, presented as a hierarchical model, was proposed by Mehrabian and Russell (1974) to explain better the willingness to buy in response to stimuli. This model is considered more effective than directly linking stimuli to purchase intentions.

Stimulus is made up of all external environmental factors in a store, including atmosphere (Donovan et al., 1994), store design (Jang et al., 2018; Nusairat et al., 2020), brand image (Simanjuntak et al., 2020), crowding (Anninou et al., 2018) as well as colour, scent, and music (Roschk et al., 2017). These stimuli evoke various consumer responses (Nagano et al., 2023). Prior research has examined the reactions via the lenses of emotional states (Anwar et al., 2020), satisfaction (Roschk et al., 2017), and perceived quality (Nusairat et al., 2020). Based on these responses, Nagano et al. (2023) have concluded that consumer behaviour is either avoidance or approach. Approach behaviour is a positive attitude towards the surroundings, such as remaining in a place. On the other hand, avoidance behaviour represents a negative attitude towards the surroundings, for instance, running away from a location. The organism in S-O-R theory emphasises emotion, where three emotional states of pleasure, arousal, and dominance are used. These three emotional states are the P-A-D model (Donovan & Rossiter, 1982).

The S-O-R (Stimulus-Organism-Response) theory explains the effect of visual stimuli on consumer behaviour in online fashion shopping. The visual design also influences impulse buying since appealing cues may stimulate emotional responses that lead to spontaneous purchases (Lee et al., 2021). This concept asserts that external visual stimuli, such as high-quality images and effective visual merchandising, influence customers' internal processes in specific behaviours. Hence, aesthetic presentation is also essential in capturing attention and developing emotional connections with items (Mo et al., 2022). Nevertheless, poor visual quality harms customer emotions and attitudes (Mo & Dingbang, 2022). Thus, mental visualisation, such as touch based on visual stimuli, might increase product appeal and purchase likelihood. Sha and Lin (2022) explained that visual complexity influences behaviour differentially across age groups, implying that retailers should consider their target demographic when developing online stores. Lin & Lin (2022) found that retailers should reduce layouts and decorations since the excessive visual complexity in clothing stores distracts older shoppers. Therefore, using the S-O-R theory can assist online businesses in understanding how visual stimuli influence consumer behaviour to increase engagement and sales through strategic visual communication.

As a result, this study aims to discuss the characteristics of visual stimuli in online fashion retail among online customers and identify the effects of visual stimuli on pleasure, arousal and dominance (P-A-D) that affect online shopper's emotions and behaviour. In addition, this study looks into how P-A-D can affect online buyers' intentions to purchase online. A literature review is being developed to outline the gaps in knowledge that will serve as the foundation for a theoretical model to predict P-A-D from visual stimuli that influence the consumers' desire to make an online retail fashion purchase.

2. Literature Review

Visual Stimuli Attributes in Online Fashion Retail (S)

Visual stimuli influence customer behaviour, especially in marketing and product presentation. Colour, design, and images significantly impact consumer perceptions, emotions, and purchasing decisions. Visual stimuli draw attention, stimulate emotions, and communicate product information, all contributing to a better overall consumer experience. For example, visual attractiveness in e-commerce can lead to impulse purchases (Karim et al., 2021). Still, visual marketing methods like colour and design are critical for consumer engagement (Huang et al., 2023). Additionally, visual stimuli can elicit significant emotional responses, impacting consumer decisions, as demonstrated by visual imagery's effect on food cravings and purchasing behaviour (Shahriari et al., 2019).

Visual stimuli are essential in online marketing, influencing consumer behaviour, engagement, and purchasing decisions. Elements such as website design, images, and colour influence the online purchasing experience. Knowing these elements aids in strategy optimisation and improves marketers' customer relations. A website's visual attractiveness, such as homepage attraction and product reviews, directly impacts consumer pleasure and arousal, influencing purchase decisions (Sivakumar et al., 2023). Colour also plays an essential role in influencing purchase intention, and different colours induce specific emotions. Warm colours imply urgency, whereas cool tones arouse peace and trust (Kong et al., 2018).

Furthermore, clean and engaging graphics improve consumer experiences but might need clarification (Damen et al., 2021). Incorporating multimedia features such as audio and video can also improve the website's visual stimuli experience. Mardhatilah (2023) explained that combining visual and audio stimuli improves attention and information retention. Websites with dynamic visual content, such as videos or interactive graphics, tend to engage consumers better than static images alone (Murtarelli et al., 2021). This multimedia approach draws attention and allows for a more immersive user experience, enabling extended interaction periods and a more profound content investigation. Figure 1 indicates an example of a website for a men's fashion brand in Malaysia that provides attractive colour tones and portrays images and information suitable for stimulating Muslim customers.

Apart from that, Instagram has become a top social media site for visual stimulation. Since its establishment in 2010, it has become a primary hub for image and video sharing, considerably impacting social interaction, marketing, and personal expression. The platform's design prioritises visual material over language, increasing user engagement with features such as filters, stories, and reels that promote creative expression. This visual focus effectively appeals to marketers, who use it to engage customers (Mardhatilah, 2023; Pelletier et al., 2020). According to Radzi & Bolong (2021) and Marengo (2023), visually appealing content on Instagram can positively influence users' emotions, increasing happiness and satisfaction. However, it can also lead to adverse outcomes, such as feelings of inadequacy, particularly among adolescents. Instagram also plays an integral part in social movements, employing visual content to disseminate messages and mobilise support. This demonstrates the importance of visual stimuli in personal expression and social discourse (Fathir et al., 2022). Instagram relies on visual stimuli to engage users, impact emotions, and drive social connections, making it an essential platform for personal and marketing initiatives. Figure 2 shows the looks for Elrah Exclusive on the Instagram platform, in which the photos are presented in high quality and match their target market, focusing on the young generation.

Figure 1: Elrah Exclusive Websites

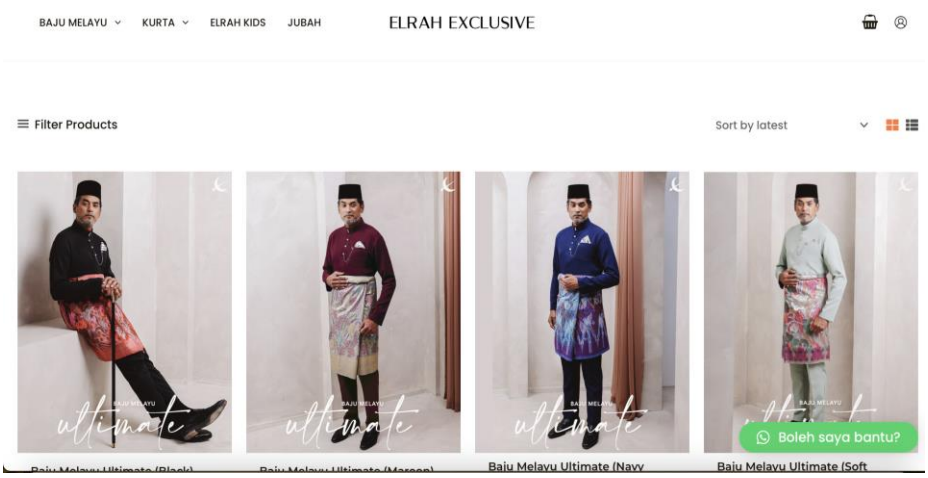
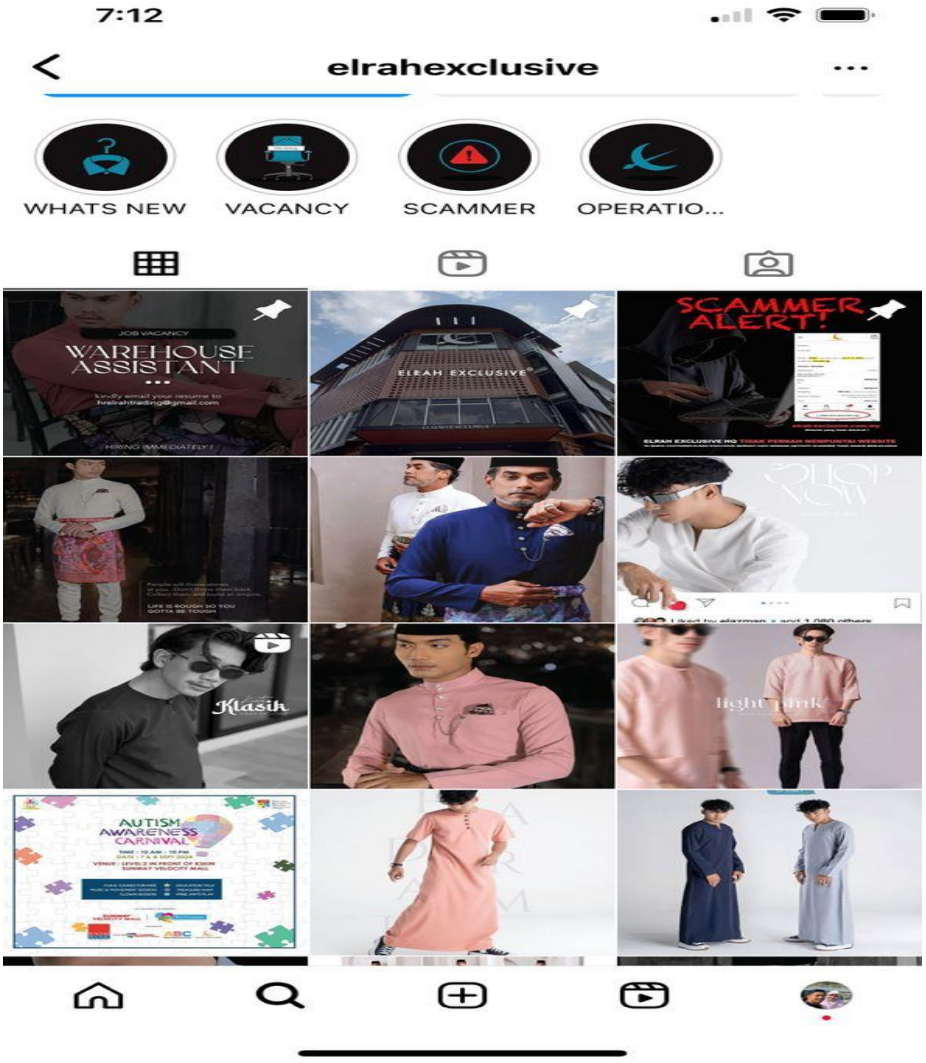


Figure 2: Elrah Exclusive on Instagram



Mehrabian and Russell Theory (P-A-D model) (O)

The pleasure-arousal-dominance (P-A-D) model featured three dimensions of basic emotions: pleasure (which refers to feeling happiness or satisfaction), arousal (which refers to feeling in the stimulus), and dominance (which refers to feeling in control over conditions) (Mehrabian & Russell, 1974). This model is critical in influencing online consumer behaviour. It offers a refined understanding of how emotional reactions to stimuli can influence purchase decisions, making it essential in online fashion retail.

The S-O-R theory and the P-A-D model are interconnected in understanding consumer behaviour in online fashion retail. The S-O-R theory focuses on the interaction between environmental stimuli, internal psychological processes, and behavioural responses. At the same time, the P-A-D model specifically categorises emotional responses into three dimensions: pleasure, arousal, and dominance. The external stimuli presented through website design and marketing strategies influence the internal emotional states of consumers, which are categorised into pleasure, arousal, and dominance. These emotional states, in turn, drive consumer responses, such as purchase intentions and brand loyalty.

Pleasure refers to the satisfaction or enjoyment gained from aspects such as website aesthetics and ease of navigation, which have been connected to increased purchase intentions and customer loyalty (Hoffman et al., 2015; Mazaheri et al., 2011). Visually appealing websites boost user satisfaction, increasing engagement and purchase likelihood (Dewi et al., 2019; Santo & Marques, 2021). As the pleasurable experience derived from engaging with a well-designed website can lead to favourable consumer responses such as brand loyalty and repeat purchases, this finding supports the S-O-R theory (Yang et al., 2020).

Arousal measures the level of excitement elicited by stimuli such as dynamic content and promotions, which can increase engagement and lead to impulsive purchases. In online fashion retail, dynamic visuals, interactive features, and promotional offers can heighten arousal levels, subsequently influencing impulsive buying behaviour (Liu et al., 2019). This aligns with the S-O-R model, where heightened arousal as a response to stimuli can lead to increased impulsive purchasing actions. Nevertheless, excessive arousal may create decision fatigue (Daroch et al., 2021). Arousal encourages the excitement induced by visual cues such as animations or brilliant colours—increases engagement and might lead to impulsive purchasing, though excessive arousal may promote decision fatigue (Shukla & Misra, 2021; Chen et al., 2021).

Dominance refers to consumers' sense of control over decision-making, with clear information and ease of choice increasing confidence and decisiveness (Alsaggaf & Althonayan, 2018). Optimising these emotional qualities allows online platforms to provide more engaging and enjoyable experiences, enhancing customer loyalty and conversion rates. Moreover, dominance refers to users' sense of control while surfing a website. Clear visuals and easy navigation increase this sensation of control, leading to positive purchase intentions, whereas poor visual clarity can result in confusion and reduced purchase rates (Kudeshia & Kumar, 2017; Lee et al., 2017). In online fashion retail, this can manifest through features that empower consumers, such as personalised recommendations and user-generated content, which suggest that the perception of dominance can significantly affect how individuals respond to various stimuli in their environment (Krause et al., 2020).

Purchase Intention as Response (R)

Purchase intention is the likelihood that a consumer intends to buy a product or service in the future, and it is a strong predictor of actual purchasing behaviour. It is impacted by intrinsic (personal preferences and emotional responses) and extrinsic (marketing and social influences) aspects. According to Bhatti and Rehman (2020), marketers may enhance consumer interaction and forecast sales by better understanding purchase intention. The combination of pleasure, arousal, and dominance in response to visual stimuli significantly impacts purchasing intentions. Pleasurable experiences, measured by pleasant emotional responses, have been linked to higher purchase intentions (Huang et al., 2019; Ma et al., 2020). For example, a visually appealing website that induces pleasure can increase user satisfaction and stimulate repeat transactions (Ma et al., 2020). Similarly, increased arousal levels might trigger impulsive purchasing behaviours, especially when consumers are confronted with appealing promotional offers or limited-time discounts (Chen & Wang, 2022; Takaya, 2019).

3. The Stimuli-Organism-Responses (S-O-R) & Proposed Conceptual Framework

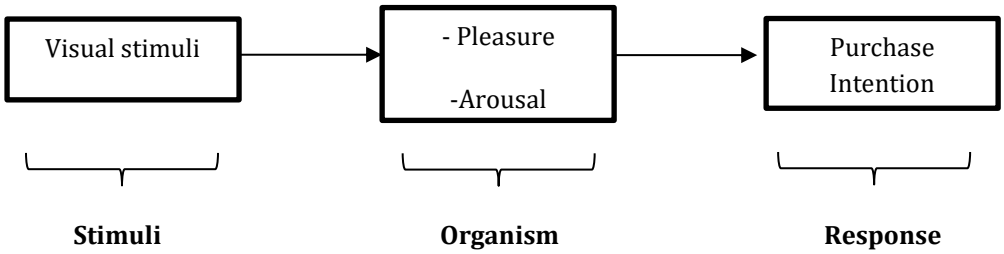
The Stimulus-Organism-Response (S-O-R) model is a fundamental paradigm in consumer behaviour research that describes how external stimuli influence internal cognitive and emotional processes (the organism), resulting in observable behaviours. Mehrabian and Russell (1974) created this concept, frequently utilised in retail, internet purchasing, and consumer engagement. Due to its elements, the S-O-R theory provides a robust framework for understanding consumer behaviour in online fashion retail. In the world of online fashion shopping, a variety of stimuli have a substantial impact on consumer attitudes and purchase behaviours. These stimuli include website design, product display, and marketing methods. Stimuli in online fashion shopping might be visual components like product photos, website design, and promotional content. For example, it emphasises the significance of atmospheric signals in the fashion retail industry. It points out that a well-thought-out online space can improve customer comfort and impact buying intentions (Ballantine et al., 2015). Similarly, interactive technologies, such as augmented reality, allow consumers to visualise products more engagingly, reducing uncertainty and enhancing the shopping experience (Baytar et al., 2020). This aligns with the S-O-R framework, where the online environment serves as a stimulus that can evoke positive emotional responses from consumers.

According to the S-O-R model, exterior stimuli such as marketing cues and product features trigger internal responses influenced by consumers' psychological and emotional states. These responses can influence behaviours such as purchasing or brand loyalty (Negash, 2024; Hossain, 2023; Laato et al., 2020). The organism component of the S-O-R model consists of psychological processes such as emotions, perceptions, and cognitive assessments that mediate the link between stimulus and reaction. Individual values and emotional states might cause distinct responses to the same stimuli, especially in crises like the COVID-19 pandemic (Rayburn et al., 2021). This emphasises the necessity of knowing the organism's involvement in perceiving inputs, which can significantly impact customer behaviour. Factors such as perceived value, emotional attachment, and cognitive evaluations play crucial roles in online fashion retail. For example, it discusses how emotional attachment to fashion apps can influence consumer responses, highlighting the significance of perceived value in shaping online shopping behaviours (Patel, 2023).

Additionally, Lee & Lee's (2019) study that explores the concept of online retail therapy posits that favourable emotional experiences associated with online shopping can enhance consumer attitudes toward online platforms. These internal psychological processes are critical in determining how consumers interpret stimuli and decide their purchasing actions. The response aspect of the S-O-R model encapsulates the behavioural outcomes resulting from the interaction between stimuli and the organism. In online fashion retail, responses can manifest as purchase intentions, brand loyalty, or engagement with marketing content. For instance, it examines how social media marketing activities can drive impulse buying intentions among consumers, demonstrating the direct link between stimuli (social media interactions) and consumer responses (impulse purchases) (Safeer, 2024). Furthermore, the study highlights how online flow experiences can lead to awe and influence purchase intentions, showcasing the importance of engaging online environments in eliciting consumer responses (Khare et al., 2023).

In conclusion, the S-O-R theory offers a comprehensive framework for analysing consumer behaviour in online fashion retail. By understanding how various stimuli affect internal psychological processes, marketers can better predict consumer behaviour and tailor their strategies to enhance engagement and drive purchasing decisions. The interplay between external stimuli, internal evaluations, and behavioural responses underscores the complexity of consumer interactions in the digital fashion marketplace. The S-O-R model is often used to investigate impulse purchases, particularly in sensory-rich contexts. Thus, Figure 3 presents the proposed conceptual framework for this research:

Figure 3: Proposed conceptual framework



4. Discussion

Recent studies highlight the critical impact of visual merchandising on consumer emotions and purchasing behaviour in online environments. Strategic visual design elements, such as website aesthetics and product videos, enhance pleasure and arousal, effectively converting browsers into buyers (Sivakumar et al., 2023). These emotional responses—pleasure, arousal, and dominance—are powerful drivers of consumer decisions, especially in e-commerce settings (Alshohaib, 2024). Beyond mere aesthetics, the psychological influence of visual content is significant. For instance, marketer-generated and user-generated images in the online hotel sector can shape booking intentions by eliciting strong emotional responses (He, 2023). Similarly, visual complexity, particularly on mobile shopping platforms, plays a crucial role in consumer behaviour, where the right balance of appeal and clarity optimises user experience and encourages purchases (Liu et al., 2019). Additionally, integrating sensory marketing elements like audio and visual stimuli enhances consumer engagement, creating immersive experiences that drive behaviour on digital platforms (Mardhatilah, 2023).

The relationship between pleasure, arousal, and dominance is central to understanding consumer purchase intentions in online shopping. Positive emotional experiences, such as those evoked by well-designed visual merchandising, often lead to repeat purchases (Alshohaib, 2024). Arousal can influence consumer behaviour in various ways, with heightened arousal linked to impulsive buying in online contexts (Liu et al., 2019). Dominance, or the consumer's sense of control, can foster positive engagement and brand loyalty (Effendi, 2023; He et al., 2019). A well-designed online shopping environment that balances these emotions can significantly increase purchase intentions (Yang et al., 2020). Hence, leveraging these emotional dimensions through effective visual design and engaging content is critical to driving consumer engagement and sales in online retail. By integrating insights from both models (S-O-R and P-A-D), marketers can better design online shopping experiences that enhance consumer satisfaction and engagement.

5. Managerial & Theoretical Implications

The study highlights numerous critical managerial implications for e-commerce companies. Businesses should invest in visually appealing and intuitive website designs to maximise consumer satisfaction and purchase intentions. Companies can drive impulsive buying behaviours by exploiting emotional cues through dynamic content and engaging images, but these aspects must be balanced carefully to prevent overwhelming customers. Furthermore, combining multifaceted features such as audio and user-generated material can result in immersive experiences that strengthen emotional bonds and influence purchasing decisions. A significant feature of this technique is managing visual complexity, especially on mobile platforms where clarity is essential for user engagement. Therefore, providing control during the purchasing experience can boost brand loyalty and encourage repeat purchases. By emphasising visual appeal, emotional engagement, and user-friendly interfaces, e-commerce managers may develop more effective, emotionally resonant shopping experiences that drive consumer behaviour and sales.

The study proposes various theoretical implications for understanding customer behaviour in online shopping contexts. It emphasises the role of the Pleasure, Arousal, and Dominance (P-A-D) model in understanding how visual stimuli influence customer emotions and purchasing intentions. The study supports the idea that emotional reactions—such as the pleasure obtained from visually appealing designs, the arousal induced by dynamic content, and the dominance resulting from a sense of control—are essential in influencing consumer behaviour using the P-A-D model. The findings imply that these emotional characteristics do not exist in isolation but rather interact to influence how customers interact with online platforms and make purchases.

Furthermore, the study increases our theoretical understanding of how visual merchandising and sensory marketing concepts lead to emotional involvement. It emphasises that visual content's psychological influence extends beyond aesthetics, influencing booking intentions and purchasing behaviour via emotional responses. This highlights the importance of models that account for the intricate interplay between visual complexity, emotional reactions, and consumer behaviour.

Conclusion

In conclusion, the study emphasises the importance of visual inputs in determining consumer emotions and behaviours in online buying settings. Using the Pleasure, Arousal, and Dominance (P-A-D) model shows how aesthetic appeal, visual complexity, and sensory integration influence purchasing intentions. Positive emotional experiences accompanied by appealing graphics and engaging content can increase consumer satisfaction and boost sales. It also demonstrates how the intentional use of visual and sensory aspects may result in immersive and engaging experiences, increasing consumer engagement and loyalty. The study's findings imply that online merchants should create visually appealing and user-friendly platforms that balance pleasure, manage arousal, and nurture a sense of control to optimise consumer interactions and increase purchase rates. This complete approach not only improves theoretical understanding but also gives practical insights for marketers looking to improve the effectiveness of their digital initiatives and achieve successful e-commerce outcomes.

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Promoting and Improving the Tourism Industry in Malaysia through Tourist Satisfaction

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Abstract: Tourism is an important sector that contributes to the countries' economies. Tourism has a direct relationship with other industries such as hotels, transportation, and retail as tourists who come to the country will spend their money on these categories. During the COVID-19 pandemic, the tourism industry was badly affected and so did the other related industries. Now, people are back visiting attractive places, staying in hotels during their visits, and spending money on food and other items. However, little is known about why people are attracted to visit some places or countries and not others. The study is meant to investigate the factors that lead to tourist satisfaction when they visit a country. A total of 150 respondents answered the survey that was distributed to students, and public and private sector employees in Malaysia through an online platform. The results indicated that accommodation, tourism products and host attitudes were significant in leading to tourist satisfaction. While price was not a significant predictor of tourist satisfaction. The practical and theoretical implications of the study are discussed at length in this paper.

Keywords: *Accommodation, tourism products, price, host attitudes, tourist satisfaction*

1. Introduction and Background

The tourism industry can be defined as any activity involving the short-term movement of people to locations other than their customary residence. It is one of the world's major industries, and several countries' economies are mostly supported by their tourism activities. Moreover, this is also a broad industry that encompasses the hotel business, transportation, and a range of other industries or sectors. It is true to recognize that the tourism sector is reliant on individuals traveling to different places for a variety of reasons, including leisure, business, and other factors (Raza, Zhong, & Safdar, 2022). The tourism business relates to four types of experiences gone through by a person at three stages of the visit: before, during, and after the visit (Godovykh, & Tasci, 2020). Under the COVID-19 pandemic, tourism is one of the industries most affected by the non-arrival of tourists.

Previous research indicated that there were factors that led to the problem related to this study which is tourist satisfaction when they spend money on hotels and restaurants, transportation, tourist information centers, marketplaces, sporting events, cultural attractions, and other items. When tourists buy imported goods and services rather than indigenous products and services, the cumulative impacts of tourism are reduced (Mato, & Mosoma, 2022). In that instance, tourism revenues increase, however, whether they help local industries is debatable (De Siano, & Canale, 2022). Moreover, this is complex to describe the framework of a tourism product, which implies that it is difficult to ascertain exactly how much money the business participates in the tourism product directly or indirectly (Custódio Santos, Ferreira, Costa, & Santos, 2020).

Thus, the study focused on understanding tourist satisfaction in the tourism industry just after the COVID-19 pandemic by investigating the relationship between accommodation, tourism products, price and host attitudes toward tourist satisfaction.

2. Literature Review

Customer satisfaction has become the most important aspect being considered in most service industries. Studying the existing literature shows that tourist satisfaction is an important factor in choosing a destination which means that if a tourist is satisfied with his journey to a destination, he is likely to return or recommend it to others (Widjaja, Jokom, Kristanti, & Wijaya, 2020). According to Al-Adwan, Al-Debei, and Dwivedi (2022), customer satisfaction is recognized as a very important aspect of all commercial firms because it influences

repeat purchases and word-of-mouth recommendations. Furthermore, Kotler and Keller (2016) stated that customer satisfaction is the feelings of contentment or dissatisfaction that arise from comparing the perceived performance of items with the expected outcome. The consumer will be dissatisfied and unhappy if the perceived performance does not meet the tourist's expectations.

Accommodation refers to a set of rooms or a building where tourists may live or stay (Hou, & Wu, 2021). It is essential for visitors who wish to travel to another destination or go on a trip because they will always need a place to stay. The types and availability of accommodation in a tourist destination area reflect the image of the destination to the tourists (Leković, Tomić, Marić, & Ćurčić, 2020). Accommodation has an everlasting influence on tourist destinations and as such the accommodation services are intended to provide maximum comfort and satisfaction to tourists (Onigbogi, Ajayi, & Yakub, 2021). Tourism is a matrix, it is necessary to expand and develop the tourism industry, and a suitable choice of accommodation is needed (Martín-Martín, Prados-Castillo, Jimenez Aguilera, & Porras Gonzalez, 2023). Therefore, the following hypothesis is developed:
H_1: Cozy accommodation will lead to overall tourist satisfaction.

The amount of physical and psychological outcomes provided to the tourists during their traveling route to the destination is referred to as the tourism product. The tourism product comprises facilities and services that cater to the needs of tourists. It can be thought of as a composite product, consisting of the sum of a country's tourist attractions, transportation, lodging, and entertainment, all of which contribute to tourist satisfaction (Zhang, Plathong, Sun, Guo, Munnoy, Ma,... & Tanboot, 2020). It is difficult to define the structure of a tourist product, which means it is also difficult to figure out how much each firm participates in the tourist product directly or indirectly (Custódio Santos, et al., 2020). Moreover, nowadays companies operate in a situation called global competitiveness and it is still impossible to define global tourism products due to the different demographic characteristics of tourists, as well as the uneven quality of services provided that partly contributes to the overall competitiveness of destinations. Thus, the following hypothesis is developed:
H_2: Satisfying tourist products will lead to overall tourist satisfaction.

One of the most crucial elements of tourism marketing is pricing. Customers in the tourism industry rate the products based on their price, and without a price, there is no indication of worth. Esquivias, Sugiharti, Rohmawati, Setyorani, and Anindito (2021) stated that price is an economic factor that has a significant impact on visitor flow; it has a direct impact on tourism demand and contributes to its elasticity. The low-price strategy is commonly used to attract more tourists, particularly to new tourist locations that have just recently begun to promote themselves on the global tourism market (Napierała, & Pawlicz, 2023). External and internal variables influence pricing in the hospitality business. Internal factors include costs, organization, and working conditions. One of the most important internal factors is cost. Therefore, the following hypothesis is developed:
H_3: An affordable price will lead to overall tourist satisfaction.

A host attitude towards tourists is essential for the long-term development of the tourism industry. The success of tourism development depends on the balance of the relationship between the tourists and the hosts (De Siano, & Canale, 2022). A negative host attitude can damage the reputation and destination image and it can cause conflict between tourists and hosts which is a phenomenon that differs and deviates from the initial motivation of tourist development. In addition, when the development of the destination occurs the number of tourists also will increase, host's attitude gradually becomes apathetic, annoyed, and ultimately antagonistic (Fan, Liu, & Qiu, 2019). Moreover, the hosts' reactions to tourist development can be divided into four stages namely embracement, tolerance, adjustment, and withdrawal, which correspond to their changing attitudes during the tourism development process (Guaita Martínez, Martín Martín, Ribeiro Soriano, & Salinas Fernández, 2021). Therefore, the following hypothesis is developed:
H_4: A positive host attitude will lead to overall tourist satisfaction.

3. Research Methodology

The variables in this study were measured using a descriptive study technique. The study population comprised students, and public and private sector employees in Malaysia aged 18 and above. The samples were acquired using convenience sampling techniques. The questionnaires were distributed to participants using several online platforms, resulting in a total of 150 completed questionnaires.

The Statistical Package for Social Sciences (Version 28) was employed to conduct descriptive, reliable, correlational and multiple regression analyses. Multiple regression analysis was used to assess hypothesis testing and the strength of the relationship between variables. In addition, Pearson's correlation analysis was employed to identify the nature and degree of the associations between the variables.

4. Data Analysis and Findings

The findings indicated that a total of 150 respondents answered the survey that was distributed to students, and private, and public sector employees in Malaysia. The table below shows the analysis of the data obtained about the demographics of respondents, followed by factor analysis of independent variables, factor analysis of the dependent variable, reliability analysis, correlation analysis and multiple regression analysis.

Table 1: Demographic Profile of Respondents

Variable	Description	Frequency	Percentage
Gender	Male	50	33.3
	Female	100	66.7
Age	18-25 years old	119	79.3
	25-35 years old	11	7.3
	35-45 years old	9	6.0
	45-55 years old	8	5.3
	55 years old and above	3	2.0
Occupation	Student	106	70.7
	Unemployed	6	4.0
	Private sector employee	19	12.7
	Public sector employee	19	12.7
Marital status	Single	118	78.7
	Married	30	20.0
	Others	2	1.3
Race	Malay	145	96.7
	Chinese	2	1.3
	Others	3	2.0
Income	No income	108	72.0
	RM 1,000- RM 2,500	15	10.0
	RM 2,501- RM 5,000	19	12.7
	RM 5,001- RM 7,500	8	5.3

Based on Table 1 demographic profile of respondents, in terms of gender distribution female respondents consist of 100 respondents, which is equivalent to 66.7% while male respondents consist of 50 respondents, which is equivalent to 33.3%. Regarding age distribution, 119 respondents aged between 18 and 25 years old, which is equivalent to 79.3%. This is followed by the age group of 25 to 35 years old consisting of 11 respondents, which is equivalent to 7.3%. Then, the age group of 35 to 45 years old consists of nine respondents, which is equivalent to 6%. Then, the age group of 45 to 55 years old consists of eight respondents, which is equivalent to 5.3% followed by the age group of 55 years and above, which consists of three respondents, which is equivalent to 2%.

Next, in terms of occupation, most of the respondents were students of IPTA and IPTS, which consist of 106 respondents, which is equivalent to 70.7%. This is followed by private and public sector employees consisting of 19 respondents, which is equivalent to 12.7%. The last group is the unemployed, which consists of six respondents, which is equivalent to 4%.

In terms of marital status, single respondents consist of 118 respondents, which is equivalent to 78.7%. Then, married respondents consist of 30 respondents, which is equivalent to 20%, followed by the status of “others” consisting of 2 respondents, which is equivalent to 1.3%.

Next, respondents' race, most of them were Malays consisting of 145 respondents, which is equivalent to

96.7%. This is followed by Chinese who were represented by 2 respondents, which is equivalent to 1.3%, then followed by other races consisting of 3 respondents, which is equivalent to 2%.

Lastly, in terms of income, most respondents did not earn a stable income consisting of 108 respondents, which is equivalent to 72%. This is followed by those in the income group of RM 2,501- RM 5,000 consisting of 19 respondents, which is equivalent to 12.7%. Then, 15 respondents had monthly income ranging from RM 1,000- RM 2,500 representing 10% of the total respondents and then followed by those having income ranging from RM 5,001- RM 7,500 consisting of eight respondents, which is equivalent to 5.3%.

Table 2: Results of Factor Analysis for the Independent Variables

	Component			
	1	2	3	4
Accommodation 14	.812			
Accommodation 12	.794			
Accommodation 15	.772			
Accommodation 13	.709			
Tourism products 8		.818		
Tourism products 10		.699		
Tourism products 9		.693		
Tourism products 6		.662		
Tourism products 11		.577		
Price 16			.828	
Price 17			.777	
Price 18			.759	
Price 19			.611	
Host attitudes 2				.825
Host attitudes 3				.754
Host attitudes 4				.628
Host attitudes 1				.559
% variance explained (69.8)	19.42	17.76	16.88	15.75
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.				.917
Bartlett's Test of Sphericity	Approx. Chi-square			1500.379
	df			136
	Sig.			.000
MSA				.858 - .953

Based on Table 2 factor analysis of the independent variable shows that the first component consists of four items that measure accommodation. The second component consists of four items that measure tourist products. The third component consists of four items that measure pricing. The last component consists of four items that measure host attitudes. The variance explained for component 1 is 19.42%, component 2 is 17.76%, component 3 is 16.88% and component 4 is 15.75%. The total variance explained is 69.806%. Next, the Kaiser-Meyer-Olkin Measure of Sampling Adequacy value from the analysis is 0.971 which is sufficient to proceed with analysis. Bartlett's test of Sphericity indicates the significant values which means that the correlation matrix is significantly adequate. The values of MSA (measure of sampling adequacy) range from .858 to .953. Overall, the factor analysis of independent variables proves the existence of four factors.

Table 3: Results of Factor Analysis for the Dependent Variable

	Component
	1
Tourist satisfaction 21	.890
Tourist satisfaction 22	.887
Tourist satisfaction 20	.856
Tourist satisfaction 23	.842

Tourist satisfaction 24		.788
% variance explained		72. 85
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.877
Bartlett's Test of Sphericity	Approx. Chi-Square	466.389
	df	10
	Sig.	.000
MSA		.860 - .917

Factor analysis of the dependent variable in Table 3 showed that there is one component consisting of five items that measure tourist satisfaction. The variance explained is 72.85%. Next, the Kaiser-Meyer-Olkin Measure of Sampling Adequacy value from the analysis is 0.877 which is sufficient to proceed with analysis. Bartlett's Test of Sphericity indicates the significant values which means that the correlation matrix is significantly sufficient. The values of MSA range from .860 to .917. Overall, the factor analysis of the dependent variable indicates the existence of only one factor to measure the dependent variable.

Table 4: Results of Descriptive, Reliability and Correlation Analysis

No	Variables	Mean	SD	1	2	3	4	5
1	Accommodation	4.01	.64	(.894)				
2	Tourist Products	3.79	.68	.645**	(.857)			
3	Price	3.62	.76	.614**	.623**	(.872)		
4	Host Attitudes	3.85	.63	.594**	.587**	.607**	(.798)	
5	Tourist Satisfaction	5.29	.91	.599**	.644**	.554**	.597**	(.904)

The reliability analysis in Table 4 showed all items measuring the variables have Cronbach's Alpha higher than 0.857 which is tourist product while the lower score is 0.798 which is related to host attitude. Correlation analysis shows the highest mean value is 5.29 which is for tourist satisfaction with a standard deviation of .91 while the lowest mean value is 3.62 which is for pricing with a standard deviation of .76. Looking at the correlation between the independent variables and the dependent variable, all independent variables comprising accommodation, tourist product, price, and host attitude are correlated significantly with tourist satisfaction. The highest correlation is between tourist products ($r=.644$; $p<.01$) and tourist satisfaction and the lowest correlation is between price and tourist satisfaction ($r=.554$; $p<.01$). All other factors are correlated significantly with tourist satisfaction. These significant relationships indicate that all four independent variables have a potential influence on tourist satisfaction as the dependent variable.

Table 5: Results of Multiple Regression Analysis

Variables	Std Beta Coefficients	Sig.
Accommodation	.193	.022
Tourist Products	.323	.000
Price	.089	.282
Host Attitudes	.238	.003
R^2	.516	
Adjusted R	.502	
F Value	38.5	
Sig. F value	.000	
Durbin-Watson	1.95	

Table 5 shows the result of a multiple regression analysis concerning the predictors that contribute to tourist satisfaction. The significant predictors are accommodation ($\beta=.193$, $p<.05$), tourist product ($\beta=.323$, $p<.01$), and host attitude ($\beta=.238$, $p<.01$). Pricing is not a significant predictor of tourist satisfaction ($\beta=.089$, $p>.05$). The regression model is significant with an F value of 38.5 whereas the R2 value is .516 which explained 51.6% of the variance in the regression analysis. Lastly, the value of Durbin Watson of 1.95 indicates that there is no

issue of autocorrelation in the regression model.

Discussion

Accommodation is the third significant factor that affects tourist satisfaction. Having cozy accommodation will make tourists happy and for sure they will revisit the destination (Purba & Putra, 2023). Having a variety of choices with different price ranges, accommodation contributes significantly to tourist satisfaction (Jahmani, Jawabreh, Abokhoza, & Alrabei, 2023). Besides, having pleasant and courteous employees adds to the list of reasons why tourists are satisfied when visiting places in the country (Arasli, Saydam, Gunay, & Jafari, 2023).

The tourism products comprise facilities and services that cater to the needs of tourists. It can be thought of as a composite product, consisting of the sum of a country's tourist attractions, transportation, lodging, and entertainment, all of which contribute to tourist satisfaction (Zhang, et al., 2020). The research discovered that tourist products lead to tourist satisfaction. Tourists come to the country because there are a lot of attractive places to visit that are equipped with modern and satisfying facilities, including lodging, transportation, and entertainment (Anuar, Sapari, Sulaiman, Hashim, & Jaini, 2021; Islam, 2023).

Price is not a significant factor because tourists do not consider money as an issue when they can get what they want during the trip. Most tourists have allocated enough money for their trip. They are willing to spend if their spending guarantees a pleasant journey during their visit (Corbisiero, & Monaco, 2021). In general, this study has demonstrated a significant relationship between tourist products, host attitudes, accommodation, and tourist satisfaction.

The last significant factor is the host attitude, which indicates that a positive host attitude will make tourists come again (Tabaeeian, Yazdi, Mokhtari, & Khoshfetrat, 2023). Malaysians are known for their outstanding hospitality when treating their guests. They are willing to go the extra mile to assist tourists who are in need (Jiony, Lew, Gom, Tanakinjal, & Sondoh Jr, 2021). In addition, most Malaysians can speak English which facilitates communication between locals and tourists. They are proud to share their interesting stories regarding their place and the historical aspects of it with tourists, making the visit unforgettable (Tabaeeian, et al., 2023).

5. Conclusion

The tourism sector is a catalyst for the economic growth of a country. Tourism brings tourists to the country to visit various attractive places and spend heftily during their visits on food, accommodations, transportation, souvenirs, and others that also contribute to the growth of other related industries. The present study is meant to investigate factors that lead to tourist satisfaction during their visits so that the right programs and activities can be done to improve tourist satisfaction. The findings of the study show that tourism products, host attitudes, and accommodation contribute significantly to tourist satisfaction. Price does not act as a significant predictor of tourist satisfaction because tourists are willing to spend extra money if they are happy during their visit. To attract tourists visiting the country, the related agencies must ensure that tourists receive outstanding treatment from the locals, hotel employees, retailers, tourism site operators, and transportation operators since all these facilities and experiences will accumulate to form a total hedonic experience for tourists. They surely will come again to visit the country if they have formed positive impressions during their visit.

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Understanding Factors Affecting Inclusions of Students with Disabilities in Higher Education: A Study among Non-Disabled University Students

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Abstract: Inclusive education for people with disabilities is gaining importance globally, with improving factors that support the inclusion of students with disabilities in higher education as a key objective. This study explores how societal and environmental factors shape perceptions of disability, rather than viewing it solely as an individual limitation. A non-probability convenience sampling method was employed, involving 279 university students from six different faculties. Data were analyzed through frequency distribution and SPSS to examine the attitudes of non-disabled students toward the inclusion of their disabled peers in higher education. The findings reveal that environmental barriers are strongly associated with the attitudes of non-disabled students toward their peers with disabilities ($r = .693$, $p < .01$), indicating that these barriers significantly impact how students perceive and interact with those who have impairments. The non-disabled students identified specific environmental factors that either support or hinder the inclusion of disabled students in university settings. This research highlights the need for addressing environmental obstacles to foster a more inclusive and supportive educational environment for all students.

Keywords: *Inclusions, Attitudes, Environmental Barrier, Personal Belief, Non-Disabled Experience, Higher Education, Malaysia*

1. Introduction and Background

A global movement has recently gained momentum around the concept of inclusion (Hassanein, Alshaboul, Ibrahim (2021), one of the key Sustainable Development Goals (SDGs) outlined by the United Nations (UN) for the 2030 Agenda (UNSDG, 2022). This goal, as emphasized in the Incheon Declaration (UNESCO, 2016), seeks to create an education system that is inclusive, equitable, and of high quality. Both the UN and UNESCO have been at the forefront of this effort, encouraging governments, non-governmental organizations, development partners, civil society, and the media to advocate for inclusive education. This effort is aligned with the proposed SDG 4 that to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all and its corresponding targets.

Because education is both a basic human right and a key to social advancement, the governments of industrialized countries have vowed to ensure that all citizens, regardless of gender, color, ethnicity, or disability, have the opportunity to get a quality education. To promote children's holistic development, Batanero, Rueda, and Fernández-Cerero (2022) emphasized the critical importance of inclusive education. Additionally, Fernández-Batanero, Montenegro-Rueda, & Fernández-Cerero (2022) emphasized that progressive nations have established thorough legal frameworks to remove obstacles and guarantee equal educational opportunities for individuals with disabilities, promoting equality and social justice. Countries can help people with disabilities reach their full potential and make meaningful contributions to society by creating inclusive educational systems and support programs. We think that inclusive classrooms are effective because they help students of all abilities and backgrounds learn more. This can help people feel more comfortable interacting with others and lessen negative perceptions of people with disabilities. According to Wehman (2006), students with disabilities are better equipped for future opportunities in work, independent living, and higher education when they have access to education. According to Getzel (2008), this helps pave the way for a more just and egalitarian society where everyone can live in harmony.

2. Literature Review

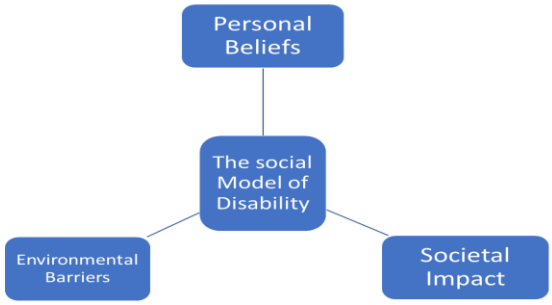
The Akta OKU 2008 in Malaysia recognizes the significance of ensuring educational access for all individuals, including those with disabilities, and mandates their inclusion in the education system irrespective of their limitations or disabilities. According to the statistics on individuals with disabilities in Malaysia (Jabatan Perangkaan, 2022), the total enrolment of impaired students in public universities in 2022 declined by 6.5 percent, with 792 students compared to 847 students in 2021. The 6.5% drop factor remains indeterminate due to resource constraints.

Although students with impairments constitute a minority in higher education institutions, this does not imply that their needs should be overlooked. Students with impairments must be afforded a conducive and accessible learning environment. The Garis Panduan Pelaksanaan Dasar Inklusif Orang Kurang Upaya (2019) was meticulously planned to improve and modernize the university's infrastructure and support systems. This law is enacted to guarantee that institutions will no longer reject the applications of individuals with disabilities seeking to further their education.

To advance the initiative, all twenty public higher education institutions in Malaysia were mandated to implement the Dasar Inklusif Orang Kurang Upaya and establish a Disabilities Service Unit to foster an inclusive environment in higher education, ensuring that students with disabilities are fully integrated into academic and social life, with equitable access to resources, opportunities, and experiences. It goes beyond just accommodating physical or learning needs—it's about fostering a culture of respect, understanding, and support, where every student, regardless of their abilities, feels valued and included. This kind of environment not only benefits students with disabilities but enriches the entire campus community, promoting diversity and empathy.

However, building and maintaining this kind of inclusive setting can be challenging, especially from the perspectives of non-disabled students. While many may support the idea of inclusion in principle, there can be gaps in understanding, awareness, and practical application that make full inclusion harder to achieve. These challenges can affect not only how students with disabilities are integrated into campus life but also the overall educational and social experience for everyone involved. To better understand the factors affecting the inclusion of students with disabilities from the perspective of non-disabled students in higher education, the social model of disability is applied as illustrated in Figure 1. The social model emphasizes how societal, cultural, and environmental factors shape disability, rather than viewing disability solely as an individual limitation. Applying this model to higher education can provide valuable insights into the challenges and opportunities for creating truly inclusive learning environments.

Figure 1: Social Model of Disability



Non-disabled students may struggle with the social dynamics that arise in inclusive classrooms. The presence of students with disabilities can lead to changes in group interactions, which may be uncomfortable for some non-disabled peers.

Maras & Brown (2000) argue that the integration of disabled peers was shaped by the personal beliefs of non-disabled students which can lead to feelings of isolation (De Boer, Pijl & Minnaert, 2012) among disabled students. Instances of peer rejection or bullying directed at students with disabilities can create an atmosphere

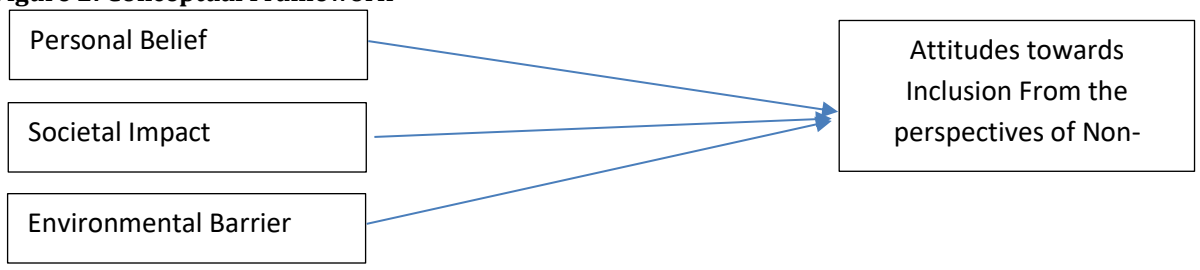
of tension, impacting the overall classroom environment and potentially leading to decreased participation from non-disabled students who may feel uncertain about how to interact appropriately. The assumption that a disabled student might be incapable (Vignes, et al., 2009) of making valuable contributions to group projects or discussions might lead to their exclusion or marginalization. Several research have identified various aspects that contribute to it. Magiati, Dockrell & Logotheti (2002) demonstrated that students without disabilities may form views about their peers with disabilities due to insufficient knowledge and awareness. The study further states that persons with limited experience with disability issues may demonstrate diminished empathy and support for those with impairments, thereby reinforcing environments that foster discrimination. Bagenstos (2000) elucidated that individual perceptions regarding disability are frequently shaped by the societal and cultural influences present during one's upbringing. In certain societies, impairments frequently face misconceptions, leading to the regrettable outcome of stigmatization. Individuals raised with the perception that disability is a cause of shame or pity may inadvertently internalize these concepts. These convictions can hinder their capacity to regard individuals with impairments as equals or peers. In addition to personal belief, social influence refers to how individuals' thoughts, behaviors, and attitudes are shaped by social factors that significantly influence individual perceptions. Societal perceptions of disabled individuals as dependent or less capable may result in non-disabled students adopting similar beliefs, thereby affecting their attitudes and interactions with each other (Green, Davis, Karshmer, Marsh & Straight, 2005).

While some students may have developed a level of empathy and understanding, particularly through exposure to inclusive practices, many still carry biases or misconceptions, consciously or unconsciously. This can lead to varied responses to inclusion, ranging from supportive engagement to subtle resistance. Society often frames disabilities in ways that emphasize difference and dependency, leading non-disabled students to unconsciously adopt these views. They may see students with disabilities as needing help or being less capable, rather than as equals. These societal messages create a barrier to real inclusion because non-disabled students may approach their peers with pity or low expectations rather than as individuals with their strengths and abilities (Abbott & McConkey, 2006). In addition, some non-disabled students, even if they support inclusion in theory, may resist it in practice. This resistance is often rooted in unfamiliarity or discomfort with interacting with students with disabilities. They may feel uncertain about what to say or do, worried about unintentionally offending their peers (Hwang & Evans, 2011). This hesitation can lead them to avoid interactions altogether, unintentionally creating an invisible divide.

In competitive academic environments, non-disabled students may also feel that accommodations for students with disabilities—such as extra time on exams or adjusted coursework—give them an "unfair advantage" (Claiborne, Cornforth, Gibson & Smith, 2011). These perceptions can foster feelings of resentment, even though accommodations are designed to provide equity, not advantage. This mindset can create tension in classrooms and undermine efforts to build a supportive, inclusive environment. Many address the substantial influence of physical and social settings on individuals' perceptions and interactions with classmates who have disabilities, about the problems of encouraging diversity in higher education. When the university lacks proper facilities to accommodate students with disabilities, non-disabled students may develop negative attitudes (Furnham & Pendred, 1983) as they witness their peers facing challenges (Tregaskis, 2000) in accessing the same educational resources. If non-disabled students see their peers struggling to reach any area on the campus due to inadequate transportation options, it may foster feelings of helplessness or resentment (Deal, 2003), further complicating their social interactions (Beckett, 2014) and perceptions of disability (Antonak & Livneh, 2000).

Based on the above literature, the three factors that are expected to directly affect the inclusion of disabled students from the perspectives of non-disabled students in a university are illustrated in the
the conceptual framework below.

Figure 2: Conceptual Framework



3. Research Methodology

A cross-sectional research design was employed to investigate the relationship between personal beliefs, societal influences, and environmental obstacles on the attitudes of non-disabled university students regarding disability. Data were collected using convenience sampling via digital platforms or e-questionnaires that were personally administered to the respective students at UiTM Puncak Alam, Selangor, Malaysia. A total of 279 students participated in the questionnaire. The questionnaire was derived from a well-established instrument, with items modified to align closely with the specific research questions of the present study. The components of personal belief were modified based on the works of Moges (2015) and Pernick (1995), societal influence was informed by Loveland (2001) and Stöckli & Hofer (2020) while environmental barriers were referenced from Kelly (1999), and attitudes were derived from Kelly (1999), Abu-Hommos (1985), and Alhamad (2021). The questionnaire employed closed-ended questions featuring a defined range of possible responses, utilizing a 5-point Likert scale with the following values: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree to assess all variables. The items were adjusted to elicit the necessary responses to address the research questions. The gathered data underwent analysis utilizing statistical software, specifically SPSS Version 26. The analysis utilized descriptive statistics, including mean and standard deviation, alongside a correlational study.

4. Results

This section outlines the findings concerning respondents' attitudes towards disabled peers, the overall characteristics of the sample, and the comparative analysis of participants' attitudes influenced by societal factors, personal beliefs, and environmental obstacles.

As shown in the statistics in Table 1, 215 students (77.1%) were in the age bracket of 21–25 when they filled out this survey, . Next came n=48 (17.2%) in the 18–20 age bracket, while n=13 were in the 25–30 age range (4.7%) and the remaining n=3 were above 30 (4.1%). The following data shows that male students n=95 made up 34.1% of the sample and female students n=184 made up 65.9%. In addition, the statistics revealed the majority of respondents n=120 (43%) were from the Faculty of Business and Management, n=43 (15.4%) from the Faculty of Education, n-32 (11.5%) were from the Faculty of Hotel and Tourism Management and Faculty of Health Sciences and n=22 (7.9%) were from the Faculty of Accountancy. These comprise n=60 (21.5%) from the 1st year, n=82 (29.5%) from the second year, n=109 from the third year (39%), and n=28 (10%) were in their fourth year.

Table 1 presents a summary of the characteristics of the entire 279 sample of respondents, specifically tertiary students, who participated in the survey.

Table 1: Demographic of Respondents (n=279)

VARIABLE	FREQUENCY	PERCENTAGE
GENDER		
Male	95	34.1%
Female	184	65.9%
Total	**279**	**100%**
AGE		
18-20	48	17.2
21-25	215	77.1
26-30	13	4.7
>31	3	1.1
Total	**279**	**100%**
EDUCATION (Faculty of)		
Business & Management	120	43
Accountancy	22	7.9
Hotel & Tourism Management	32	11.5
Pharmacy	30	10.8

Education	43	15.4
Health Sciences	32	11.5
Total	**279**	**100%**
Semester		
Year 1	60	21.5
Year 2	82	29.5
Year 3	109	39
>Year 3	28	10
Total	**279**	**100%**

Descriptive Statistics: Table 2 below presents the analysis of descriptive statistics regarding the factors influencing the inclusion of students with disabilities. This table presents the average mean scores of university students concerning their attitudes, societal influences, and experiences with environmental barriers faced by disabled peers during their time at university.

Table 2: Descriptive Statistic

A. Personal Belief Towards Inclusion From the Perspective of Non-Disabled Student

	Statement	M	SD
1.	I think attending classes in university should be the educational rights of disabled students	4.50	.699
2.	I believe that disabled students deserve support and follow-up from classmates and lecturers	4.42	.768
3.	If I am in the same class as students with disabilities, I believe I can attend	4.33	.799

Note: M=Mean, SD=Standard Deviation,
5=Strongly Disagree, 4=Disagree, 3=Neutral, 2=Agree, 1=Strongly Agree

The highest-rated statement emphasizes the belief that attending classes at the university is a fundamental educational right for disabled students. With a mean score of (M = 4.50), this suggests a strong consensus among non-disabled students that inclusion in education is essential for students with disabilities. The relatively low standard deviation (SD = 0.699) indicates that this belief is widely shared with little variation in opinion. The second statement highlights the belief that disabled students deserve support and follow-up from both classmates and lecturers. This mean score of (M=4.42) reflects a high level of agreement among respondents, showing that non-disabled students recognize the importance of a collaborative and supportive learning environment. The standard deviation of (SD = 0.768) suggests a slightly wider range of opinions on this matter but still shows a generally supportive attitude. The third highest-rated statement indicates that non-disabled students feel confident about attending the same classes as their disabled peers. With a mean score of (M = 4.33), this reflects a generally positive belief in their ability to coexist and learn in an inclusive setting. The slightly higher standard deviation of (SD = 0.799) suggests some variation in personal confidence, but the overall response remains supportive.

These results underscore a positive belief among non-disabled students regarding the inclusion of students with disabilities in higher education, with a strong emphasis on educational rights, the need for support, and a readiness to learn in an inclusive environment.

B. Societal Impact on Towards Inclusion From the Perspective of Non-Disabled Student

	Statement	M	SD
1.	I think it is important for me and my peers to support our friends with disabilities	4.35	.749
2.	I believe that differences in point of view and different life experiences can affect my view toward students with disabilities.	4.01	.906
3.	I believe society around me provides adequate support for individuals with disabilities	3.94	.916
4.	I am influenced by the attitudes of influential figures towards disability	3.46	1.174

Note: M=Mean, SD=Standard Deviation,
5=Strongly Disagree, 4=Disagree, 3=Neutral, 2=Agree, 1=Strongly Agree

The highest-rated response reflects the strong belief among students that supporting peers with disabilities is essential. With a mean of (M= 4.35), there is a clear consensus on the importance of fostering a supportive community. The standard deviation of (SD= 0.749) indicates that while the majority of students agree, there is a slight variation in the level of conviction. With a mean score of (Mean = 4.01, SD = 0.906) this statement explores how exposure to different viewpoints and life experiences influences perceptions of students with disabilities. Students generally agree that their views may be shaped by their personal experiences and perspectives. The standard deviation of 0.906, however, suggests a greater range of responses, indicating that students' backgrounds play a significant role in shaping their beliefs about disability. The third statement reflects students' beliefs about the adequacy of societal support for individuals with disabilities. With a mean of (M=3.94), students are somewhat positive but not overwhelmingly confident in the level of support provided by society. The standard deviation of (SD=0.916) suggests varying perceptions, with some students feeling that society offers sufficient support while others are more skeptical. Influence of Attitudes of Influential Figures on Disability (Mean = 3.46, SD = 1.174): This statement has the lowest mean score, indicating that students are less certain about being influenced by the attitudes of influential figures towards disability. With a mean of 3.46, responses suggest mixed feelings, and the high standard deviation of 1.174 indicates a wide variation in how much students believe they are influenced by prominent societal figures. Overall, these responses indicate that non-disabled students value supporting peers with disabilities and recognize the role of personal experiences in shaping their views. However, their confidence in societal support and the influence of influential figures on their attitudes towards disability appear to be more varied.

C. Environmental Barriers Factors Towards Inclusion From the Perspective of Non-Disabled Student

Statement		M	SD
1.	I think special parking spaces for students with disabilities are necessary	4.53	.688
2.	The university should ensure that course materials on reserve in the library are accessible in an alternate format for students with disabilities. (e.g.: Braille, etc.)	4.33	.720
3.	I think the university should encourage students with disabilities to participate equally in academic and social activities	4.30	.769
4.	I think providing accommodations, like unlimited time on exams for students with disabilities, compromises the integrity of the curriculum	3.87	1.055

Note: M=Mean, SD=Standard Deviation,
5=Strongly Disagree, 4=Disagree, 3=Neutral, 2=Agree, 1=Strongly Agree

The highest-rated response indicates a strong consensus among students that special parking spaces for students with disabilities are necessary. With a mean score of (M=4.53), there is widespread agreement that such accommodations are important for accessibility. The low standard deviation of (SD=0.688) suggests little variation in opinion, reinforcing the importance students place on this issue. Students also express strong support for making course materials available in alternate formats, such as Braille, for students with disabilities. The mean score of (M=4.33) demonstrates broad agreement on the need for accessible academic resources. The standard deviation of (SD=0.720) indicates a generally uniform belief, though with slightly more variability compared to the issue of parking spaces. The third statement shows that students believe the university should actively encourage students with disabilities to participate equally in both academic and social activities. The mean score of (M=4.30) suggests a positive attitude toward inclusion, while the standard deviation of (SD=0.769) reflects moderate variability in responses, indicating that some students may hold differing views on the extent of this encouragement. The final statement concerns accommodations compromising curriculum integrity. The lowest-rated statement addresses a more complex issue: whether accommodations like unlimited exam time for students with disabilities compromise the curriculum's integrity. With a mean score of (M=3.87), students express more ambivalence, and the higher standard deviation of (SD=1.055) reveals a greater range of opinions. Some students may feel that such accommodations are necessary, while others might question their fairness or impact on academic standards.

In summary, non-disabled students largely support the need for accessible facilities, materials, and inclusive practices for students with disabilities. However, there is more variation in their views when it comes to certain accommodations and their potential effects on the academic curriculum.

Reliability and Correlation:

The results of the reliability analysis presented in Table 3 show that all items effectively measure the intended variables: personal belief (α=.88), societal influence (α=.79), environmental barriers (α=.89), and attitudes towards disability (α=.90). The findings from the correlation analysis indicate that the independent variables exhibit significant correlations with one another, suggesting the presence of both concurrent and convergent validity. The strongest correlation (r=.693, p<.01) and the most significant factor influencing attitudes towards peers with disabilities is identified as the environmental barrier, which shows a moderate relationship (r=.676, p<.0.1). In my analysis, the weakest correlation is observed in social influence (r=.396, p<.05).

Table 3: Results of Reliability and Correlation

	Descriptive Statistics						
No	**Variable**	**Mean**	**Std. Dev.**	**1**	**2**	**3**	**4**
1	Personal Belief on Disability	4.16	.575	(.875)			
2	Social Influence on Disability	3.81	.651	.396**	(.787)		
3	Environmental Barrier on Disability	4.22	.564	.638**	.479**	(.889)	
4	Attitude towards Disability	4.05	.615	.676**	.501**	. 693**	(.895)

Notes: **. Correlation is significant at the 0.01 level (1-tailed); * Correlation is significant at the 0.05 level (1-tailed Cronbach's alphas in the parentheses along the diagonal; N=279

Regression Analysis

Table 3 presents the findings from the regression analysis conducted in this study. A multiple regression analysis was conducted to assess the student's perception of disability. The R2 value of .595 indicates that 59.5% of the variance is accounted for by the three independent variables. Additionally, 40.5% of the variance in university students' attitudes towards the inclusion of students with disabilities remains unexplained by personal beliefs, social influences, and environmental barriers identified in this study. This suggests that additional independent variables, influenced by various factors, are related to the attitudes of non-disabled university students toward friends with disabilities. These variables are not accounted for in this study and could enhance the regression equation further. The F Change is 134.4, indicating that the model of analysis is fixed, as the F change exceeds 1. The adjusted R Square serves as a metric for evaluating the goodness-of-fit across regression models with varying quantities of independent variables.

Table 4: Results of Multiple Regression Analysis

Variables	**Std Beta Coefficients**
Personal Belief on Disability	.367**
Societal Influences on Disability	.173**
Environmental Barrier on Disability	.375**
R	.771
R2	.595
Adjusted R2	.59
F value	134 .4
Sig. F value	.000
Durbin Watson	.984

** Sig. At the 0.01 level, * Sig. At the 0.05 level

Discussion-The Impact of Environmental Barriers on Attitudes Towards Inclusion: From The Perspectives of Non-Disabled Student

Understanding the factors that shape attitudes toward individuals with impairments is crucial for creating inclusive educational and social environments. This discussion emphasizes the critical influence of environmental barriers on attitudes toward peers with disabilities. The strong positive correlation (r = .693, p < .01) indicates that as environmental barriers increase, attitudes toward students with disabilities are more

likely to be negatively influenced. Environmental barriers such as inaccessible buildings, lack of specialized resources, or insufficient accommodations appear to create the most substantial challenges for both disabled and non-disabled students in fostering an inclusive learning environment. The statistical significance ($p < .01$) of this relationship suggests that environmental factors are not just coincidental but are critical in determining how students perceive and interact with their peers with disabilities. This finding emphasizes the importance of addressing physical and systemic barriers within the educational environment. Environmental barriers, such as inaccessible buildings, lack of specialized learning resources, and insufficient institutional support, significantly impact how non-disabled students perceive and interact with their peers who have disabilities. This correlation suggests that attitudes toward disabled peers are not merely shaped by personal biases or individual experiences but are deeply influenced by the structural environment in which these interactions take place.

Environmental barriers can be understood as physical, social, or organizational obstacles that impede the full participation of individuals with disabilities in everyday activities. In the context of a university setting, these barriers could manifest as inaccessible classroom buildings, inadequate accommodations such as Braille materials or sign language interpreters, or a lack of inclusive policies that encourage full participation in academic and social activities. The strong correlation found in this study suggests that when such barriers are prominent, they shape negative or indifferent attitudes toward peers with disabilities. To illustrate, when non-disabled students observe their disabled peers struggling to access classrooms, navigate campus, or receive equitable learning opportunities, they may develop a perception that disability is inherently limiting or problematic. This reinforces a mindset that disabilities are barriers in and of themselves, rather than recognizing that the true limitations stem from a lack of adequate accommodations. Consequently, the educational environment becomes a breeding ground for misconceptions and stigmatization, which further isolates students with disabilities from their peers.

5. Recommendations

The significant association between environmental barriers and attitudes toward students with disabilities underscores the urgent need for institutions to take proactive steps in breaking down these barriers. By addressing accessibility issues and fostering an inclusive campus infrastructure, universities can actively shape more positive attitudes and promote a culture of acceptance and support.

One key area for intervention is improving physical accessibility. This includes ensuring that all campus facilities, such as classrooms, libraries, dormitories, and recreational areas, are equipped with ramps, elevators, and accessible restrooms. In addition, providing assistive technologies and making course materials available in multiple formats (such as Braille, audio, or large print) can make a significant difference in enabling students with disabilities to participate fully in academic life. By removing these physical obstacles, universities not only support students with disabilities but also set the foundation for non-disabled students to view their peers as equal participants in the educational process.

Another important aspect is fostering an inclusive social environment. Universities should create programs that encourage interaction between disabled and non-disabled students, such as inclusive extracurricular activities, mentorship programs, or collaborative learning initiatives. These efforts can help non-disabled students understand the challenges their peers face and appreciate the strengths and contributions of students with disabilities. Research has shown that increased interaction with individuals with disabilities leads to more positive attitudes and reduced stigmatization, further reinforcing the importance of a barrier-free environment. The ripple effect of reducing environmental barriers not only directly benefits students with disabilities by improving their access to education but also has a broader impact on the campus community. When universities commit to creating an accessible and inclusive environment, they send a powerful message that diversity is valued and that all students, regardless of their abilities, are integral to the fabric of the institution. This fosters a culture of inclusivity that extends beyond disability to encompass other forms of diversity, such as race, gender, and socioeconomic status.

Moreover, when non-disabled students witness institutional efforts to remove barriers and support their disabled peers, they are more likely to adopt inclusive attitudes themselves. This creates a ripple effect, where

inclusivity becomes a shared value among the student body, leading to a more cohesive and supportive campus environment. Over time, this can contribute to long-term shifts in societal attitudes toward disability, as students carry these values with them into their future careers and communities.

Conclusion

In conclusion, the strong association between environmental barriers and attitudes toward peers with disabilities highlights the pivotal role that the physical and systemic environment plays in shaping perceptions and experiences. Addressing these barriers is crucial not only for ensuring equitable access to education for students with disabilities but also for fostering positive attitudes and promoting a culture of inclusivity within the broader student body. Universities bear the responsibility of creating environments that support all students, and by dismantling environmental barriers, they can take significant strides toward building more inclusive and supportive academic communities.

This study analyzed three key factors—personal beliefs, social impact, and physical obstacles—that significantly affect the inclusiveness of educational environments at the Universiti Teknologi MARA, Kampus Puncak Alam Selangor. The findings offered insights that may guide policy development, practice enhancement, and future research to foster more inclusive educational environments therefore bridging the gaps found. Perhaps the focus can be emphasized more on environmental barriers that were found to have the most significant correlation with the attitudes of non-disabled students toward their disabled peers.

Striving for inclusivity in higher education is both a moral imperative and a necessary step toward establishing diverse, equitable, and successful academic communities. Institutions must comprehend the factors that promote or obstruct inclusion to effectively accommodate a broader spectrum of individuals. Universities can foster a more inclusive and supportive environment for all by promoting affirmative mindsets and educating students on the significance of diversity. This approach perhaps may guarantee that each student can excel in their academic pursuits and contribute meaningfully to the campus community.

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Understanding the Impact of Social and Facilitating Factors on Drone Adoption in the Takaful Sector of Malaysia and Indonesia

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Abstract: The takaful industry, a sector that is guided by Shariah-compliant principles, is progressively investigating cutting-edge technologies to improve service delivery and operational efficiency. This study investigates the influence of social factors and facilitating conditions on the intention to adopt drone technology within the Takaful sector in Malaysia and Indonesia. A quantitative research design was employed, with data collected from 68 Takaful professionals. The results were analyzed using correlation and regression techniques. The findings revealed that social influence and facilitating conditions significantly impact behavior intention, while performance and effort expectancy were found to be less important. Additionally, the study integrates Maqasid Shariah principles, ensuring that the adoption of drone technology aligns with Islamic ethical considerations. The study also urges more investigation to investigate the generalisability of these results over many cultural and legal environments as well as the possible impact of developing technologies like artificial intelligence and blockchain on the sector.

Keywords: *Takaful Industry, Drone Adoption, Facilitating Conditions, Technology Adoption, Maqasid Shariah, Performance Expectancy, Social Influence.*

1. Introduction and Background

Today the demand for Shariah-compliant financial solutions is increasing as the takaful sector has been steadily expanding worldwide (Husin & Rahman, 2013). There are many challenges in the adoption of takaful such as a lack of knowledge among possible participants and varying degrees of religiosity. Moreover, overcoming the barriers and increasing the rate of market participation in the different demographic cohorts depends on the social dynamics and supporting elements that affect consumer attitudes towards implementing creative technologies, such as drones in the takaful sector. Particularly, the influence of attributes such as subjective norms perceived behavioral control, and awareness of takaful need to be evaluated by assessing their impact on the intention to adopt drones because operational tools inside this industry since these elements have been shown to greatly influence consumer behavior in similar environments (Hassan et al., 2018; Aziz et al., 2017). Both Malaysia and Indonesia, as significant players in the global Takaful market, are exploring innovative technologies, such as drones, to enhance efficiency in service delivery. However, challenges such as low awareness, different levels of religiosity, and resistance to new technologies persist, limiting wider adoption (Daod et al., 2019).

The purpose of this study is to understand how the influence of social elements on the intention to adopt drones in the Takaful industry. Even though the previous study has focused on the adoption of the technology in insurance still not many understand how these elements work in the particular setting of Takaful, especially about the function of Maqasid al-Shariah. Although the takaful sector has seen a consistent expansion in recent years, the obstacles including low awareness, different degrees of religiosity, and opposition to implementing new technologies still limit more general market involvement. Furthermore, past research indicates that the intention to interact with takaful products is much influenced by demographic variables and consumer knowledge, thus focused strategies to raise awareness and education about these financial solutions are essential for raising adoption rates among consumers from many backgrounds (Husin & Rahman, 2013).

Furthermore, the early phases of drone technology in the takaful industry present a spectrum of possibilities and difficulties. Using real-time monitoring and data collecting, cost reduction via optimal resource allocation and process automation, and faster and more personalized interactions, drone technology has the potential to improve operational efficiency (Beninger & Robson, 2020). Still, their acceptance could be shaped by a complicated interaction of social and enabling elements. The elements of perceptions of performance and effort expectation, whereby consumers may assess the possible advantages and usability of drones in providing takaful services; social influence, whereby the attitudes and behaviors of peers, family, and industry leaders shape individual willingness to embrace the technology; and alignment with Maqasid Shariah principles, whereby the integration of drones must be evaluated in the context of Islamic financial guidelines and ethics (Ab Abdullah, 2012). The influence of the elements might either help or hinder the effective integration of drone technology into the takaful sector, thus a thorough knowledge of how these elements shape consumers' attitudes and adoption intentions is necessary. It is crucial to know about creating plans that support the acceptance of creative technologies in offering financial solutions that stay compliant with Islamic values. Thus, in the framework of the takaful sector, it is crucial to pinpoint and examine the particular social dynamics and enabling conditions that can increase takaful provider confidence in using drones as well as address the issues that may develop from views of risk and compliance with Shariah standards.

2. Literature Review

Studies on consumer involvement in takaful programs already in existence have underlined the need for several social and enabling elements in determining personal intentions to interact with certain financial products. Particularly, studies show that consumers' perceptions of family takaful schemes are much influenced by their perceived behavioral control, subjective norms, and degree of knowledge about the products, together with other moderating elements such as demographic characteristics and religiosity, all of which help to determine their willingness to enroll and participate (Husin & Rahman, 2013). Furthermore, knowing consumer awareness and knowledge about takaful is essential since a lack of familiarity can prevent participation, hence underlining the need for educational activities to reveal the advantages and values underlying the takaful model to possible participants from different backgrounds (Hassan et al., 2018).

Previous research also shows that innovative technologies such as drones have influenced the attitudes of consumers and intention to adopt them due to the perceived performance and effort expectancy, social influence, and the availability of supporting infrastructure and resources. Furthermore, to enhance awareness and acceptance of drone technology, the social and facilitating factors in the takaful industry are important as well as the need for comprehensive educational campaigns and community engagement initiatives to build trust and address any concerns related to compliance with Shariah principles (Tan et al., 2021; Muhamat et al., 2021).

The Takaful industry in Malaysia and Indonesia presents unique regulatory and operational challenges. In Malaysia, the Takaful sector is well-established with a regulatory framework that supports innovation in financial services, including the use of drones for monitoring and service optimization (Daod et al., 2019). Conversely, Indonesia, while a growing market, has a relatively underdeveloped regulatory framework for integrating advanced technologies into the financial sector. The differences in regulatory approaches and market maturity in these countries justify the comparative focus of this study, as it provides insights into how these factors influence technology adoption across different environments.

Performance expectancy and effort expectancy

Several research has been conducted on consumers' perceptions of the advantages, usefulness and ease of use related to technology which have a significant impact on the consumers' intentions (Taherdoost, 2019, AlSaleh & Thakur, 2019; Abu-Shanab & Ghaleb, 2012; Lam et al., 2008; Sarkam et al., 2022). The findings of the previous research are relevant to drone adoption within the takaful industry. On one hand, consumers' perceived performance expectancy of drones may stem from the technology's capacity to streamline claims processing, enhance service delivery, and optimize operational efficiency through real-time monitoring and data collection. The consumers' effort expectancy also plays an important role when determining the takaful providers' adoption intentions to which they believe they can readily integrate drone-enabled solutions. The adoption of drone technology is more accepted when the drone is user-friendly and provides a seamless experience. The

interplay between these two critical factors of performance expectancy and effort expectancy is crucial, as consumers are more likely to adopt transformative technologies when they perceive clear benefits and believe the solutions are accessible and easy to incorporate into their existing interactions with service providers (Ismail et al., 2023; Aziz et al., 2017). As such, understanding how these expectations are shaped by social norms and the specific context of the takaful sector becomes essential for promoting successful technology adoption, especially when considering the diverse demographic characteristics and religiosity of potential users that may influence their perceptions and behaviors toward drone integration.

Based on prior studies, performance expectancy is expected to positively influence behavior intention. However, given the complex nature of the Takaful sector, it is hypothesized that the effect may be weaker due to other overriding factors such as social influence.
H1: Performance expectancy has a significant effect on behavior intention.

Effort expectancy, on the other hand, refers to the ease with which technology can be used (Venkatesh et al., 2003). In the Takaful sector, this may involve the perceived ease of integrating drones into existing workflows and the user-friendliness of the technology. The adoption of drone technology is expected to increase if the technology is perceived as easy to use and does not require extensive retraining or significant changes to existing processes (AlSaleh & Thakur, 2019; Ismail et al., 2023).
H2: Effort expectancy has a significant effect on behavior intention.

Social Influence
The social influence in technology adoption highlights an important role in shaping consumer attitudes and intentions. It is also known as the norms, beliefs and behaviors of individuals' social circles. This includes family, friends even colleagues, which greatly affects the consumers' willingness to adopt drones. Understanding social influence is also important but also because the individual's perceptions and adoption decisions are usually influenced by the opinions and actions of the surroundings. In addition, individuals normally seek approval from the closest people before adopting a product innovation or financial technology. This can lead to either facilitating or impeding the adoption of drone technology in the takaful industry, depending on how these social influences are manifested. Consequently, any strategies aimed at promoting the uptake of drones must carefully consider the complex web of social influences that can shape consumer attitudes and behaviors within the specific context of the takaful sector. In this regard, cultivating strong social networks that promote positive perceptions of drone technology may enhance readiness for adoption among takaful consumers, thereby reducing perceived risks associated with innovation (Ismail et al., 2023; Husin & Rahman, 2013). This aligns with findings in existing literature, which assert that social influences play a critical role in technology acceptance, where positive encouragement from social referents can elevate individuals' intentions toward adopting innovations, including the use of drones for enhancing service delivery in takaful (Sitorus et al., 2016; Saprikis et al., 2020).

The importance of social influence in the Takaful sector aligns with the findings of Venkatesh et al. (2003), who assert that social influence is often a strong predictor of behavior intention, especially in contexts where trust and endorsement from authoritative figures play a significant role.
H3: Social influence has a significant effect on behavior intention.

Facilitating conditions
In the takaful industry, promoting conditions that allow the seamless acceptance of new technologies is vital. These could be strong technological infrastructure and support systems given by takaful operators, such as dependable and user-friendly digital platforms that smoothly integrate drone-enabled features, thorough training programs to equip consumers with the required skills and knowledge to effectively use these innovative solutions, and dedicated technical assistance services to promptly address any issues or concerns that could develop during the transition to drone-enabled service delivery. Conferring users, reducing their fears or hesitation, and enabling them to completely embrace and include these transforming technologies in their contacts with takaful providers depends on ensuring the availability and accessibility of these thorough facilitating conditions (Haridan et al., 2020). These enabling conditions can be quite important in promoting general acceptance and use of drone technology inside the takaful industry by removing both the psychological and functional obstacles to adoption. Moreover, encouraging cooperation between takaful operators and

technology companies will help to improve these enabling conditions by enabling the creation of customized solutions that meet the particular needs and concerns of consumers, fostering a supportive environment fit for the acceptance of technology inside the sector. Recent studies underline the need to address both technological and customer-centric elements in driving successful innovation adoption, thus this cooperation not only simplifies the integration process but can also improve the overall user experience, increasing customer satisfaction and loyalty inside the takaful sector (Matsepe & Lingen, 2022).

Facilitating conditions, such as technological infrastructure and support systems, are expected to have a strong impact on behavior intention.
H4: Facilitating conditions have a significant effect on behavior intention.

Perceived cost and risk factors
Apart from the social and enabling circumstances, the research underlines the crucial need to tackle supposed cost and risk factors that might impede the acceptance of drone technology in the takaful industry. These perceived financial and operational risks can be major deterrents to consumer acceptance since people might be reluctant to adopt new technologies if they believe the expenses exceed the possible advantages or if they are worried about the dependability and security of drone-enabled services. For takaful operators (Alwateer & Loke, 2020), addressing these supposed cost and risk factors is vital (Tan et al., 2021).

First of all, they have to create open pricing policies that precisely show the expenses related to using drone technology. This will help to allay worries about the financial consequences of implementing these fresh ideas and guarantee that consumers grasp the necessary investment (Kim, 2020). Second, takaful operators should create strong risk-reducing plans to handle any technical or operational issues that customers might raise. Through third-party certifications or industry standards, this could include putting in place strict security protocols, offering thorough warranties or guarantees, and proving the dependability and safety of drone-enabled services (Alwateer & Loke, 2020). Thirdly, takaful operators should make abundantly evident to customers the long-term value proposition of drone adoption. Emphasizing the possible advantages—such as better efficiency, cost savings, and more customer experiences—that drone technology can bring about using integration; By clearly presenting these benefits, operators can enable customers to understand the whole value and support the initial outlay of funds (Beninger & Robson, 2020). Frachtenberg, (2019), through proactive addressing of the psychological and pragmatic factors influencing consumer impressions, takaful operators can create a more favorable environment for the successful adoption of drone technology, thus improving their competitiveness and delivering enhanced value to their consumers (Muhamat et al., 2021). Furthermore, including user comments on the design and deployment of drone technologies will help to allay worries about perceived expenses and risks since this participatory approach will empower consumers and instill a feeling of ownership over the technological solutions being presented, so greatly increasing their willingness to embrace and use these transforming inventions. Moreover, encouraging a culture of honest communication and ongoing interaction with consumers about drone technologies will help to dispel false beliefs about expenses and risks connected with their acceptance, strengthening a more informed customer base that is more open to innovation in the takaful sector (Ramadan et al., 2016).
H5: Perceived cost has a significant effect on overall behavior intention.

Social cost and benefit analysis
A thorough social cost and benefit analysis is necessary to completely grasp how social elements affect drone acceptance in the takaful industry. This study should look at the possible positive and negative social consequences of the extensive use of drone technology on different takaful industry players as well as the larger society. Examining the possible social advantages—such as better access to insurance services, improved customer convenience, and higher operational efficiency—which might result in cost savings and more reasonably priced coverage for consumers—is vital (Hassan et al., 2018). On the other hand, the study should also investigate the possible social costs—such as privacy, security, and possible job displacement—that drone integration might bring about. Through careful assessment of these social elements, takaful operators can make decisions that balance technical innovation with social well-being, so promoting a more sustainable and inclusive acceptance of drone technology inside the sector. This balanced approach not only conforms with ethical practices but also guarantees that the integration of drones into the takaful sector is seen favorably by the community, so reducing resistance and promoting a constructive dialogue regarding the technology's

implementation and its consequences for different stakeholders (Jiménez & Mulero-Pázmány, 2019). Sandbrook, 2015; Aggarwal et al., 2023. Furthermore, interacting with stakeholders to grasp their points of view and worries will help takaful operators negotiate the complexity of the adoption of drone technology while addressing particular social implications that might arise, such as community displacement and ethical questions related to the use of this technology (Wang et al., 2021).

Understanding how drone technology can enhance service delivery without infringing on privacy or causing significant job losses is critical to its adoption. In the Takaful industry, it is expected that social cost and benefit analysis will play a significant role in shaping behavior intention.
H6: Social cost and benefit analysis has a significant effect on behavior intention.

Maqasid Shariah
Adoption of drone technology within the takaful industry must take Maqasid al-Shariah's alignment with the basic goals of Islamic law and ethics into great account. Ensuring that the Maqasid al-Shariah preserves the fundamental values of preserving life, protecting property, safeguarding intellect, maintaining lineage, and so promoting justice and equity, it offers a thorough framework for assessing the social, moral, and spiritual ramifications of technological developments (Ibrahim, 2019). Given its effects on customer well-being, data privacy, environmental sustainability, and the general social fabric of society, takaful operators must closely assess how the integration of drone technology fits with these holy values.

Deeply embedding these Shariah-compliant issues into the adoption and use of drone technology will help takaful providers to guarantee that their innovations are not only technologically advanced but also ethically and spiritually grounded, so promoting a more complete and responsible path towards digital transformation within the sector (Muhamat et al., 2021). Edwards et al., 2023). From many stakeholder angles—including consumers, authorities, and Shariah advisers—this calls for careful analysis of possible advantages and drawbacks. The objective is to carefully balance drone technological capacity with their conformity with Islamic values of justice, protection, and preservation.

Moreover, open and participatory communication with all pertinent stakeholders will help to build trust and enable the acceptance of drone technology, so promoting an environment in which ethical issues take the front stage in the takaful industry and innovation is driven forward. Early in the technology adoption process, takaful operators should engage Shariah boards and advisory teams to ensure that all aspects of drone use conform with Islamic principles, thus strengthening consumer trust and support for these developments (Salman, 2014). Furthermore, the effective integration of drone technology into the takaful sector calls for a coordinated effort to guarantee that all stakeholders—including regulators, consumers, and Shari'ah advisers—are sufficiently informed and engaged in the process, so fostering a comprehensive awareness of the ethical and spiritual issues that must direct the integration of drone technology in the sector. As shown by the strategic alliances between financial technology and conventional Islamic financial institutions, this cooperative approach not only improves the legitimacy of the initiatives but also helps to create a shared vision of enhancing financial inclusion and accessibility through creative solutions grounded in Islamic finance principles (Haridan et al., 2020). Using these collaborations, new drone-based products and services that satisfy the various needs of consumers while adhering to Shariah compliance can be developed, so contributing to a more inclusive financial ecosystem that fits the goals of both technological advancement and religious principles (Leveraging Islamic Fintech, 2020).

In this context, the alignment of drone technology with Maqasid Shariah is expected to positively influence behavior intention, as stakeholders within the Takaful industry are more likely to adopt technologies that comply with Shariah principles.
H7: Maqasid Shariah has a significant effect on overall behavior intention.

3. Research Methodology

This study employed a quantitative research design to examine the factors influencing behavior intention toward the adoption of drone technology within the Takaful industry. The research aimed to identify the impact of various predictors such as social influence, facilitating conditions, performance expectancy, and effort

expectancy on the behavior intention of Takaful professionals in Malaysia and Indonesia.

The study utilized a purposive sampling technique to select respondents who are currently working in the Takaful industry across Malaysia and Indonesia. The sample consisted of 68 respondents, which, though small, is appropriate given the exploratory nature of the study and the niche population targeted. The respondents were employed across different Takaful operators, with the majority working at Great Eastern Takaful Berhad, Takaful Ikhlas General Berhad, Etiqa Family Takaful Berhad, and Etiqa General Takaful Berhad. The respondents' years of experience in the industry varied, with most having 5 years or less, followed by those with 6-10 years of experience.

Data was collected through a structured questionnaire distributed to professionals within the Takaful industry in both Malaysia and Indonesia. The questionnaire comprised sections that captured demographic information (e.g., gender, age, department), as well as items measuring key constructs such as performance expectancy, effort expectancy, social influence, facilitating conditions, and behavior intention. Each construct was measured using a Likert scale, where respondents indicated their level of agreement with various statements related to drone adoption in the industry. Given the cultural and regulatory differences between Malaysia and Indonesia, potential biases in responses were acknowledged. The comparative aspect of the study highlights these biases, providing a platform for future research to explore how these factors influence drone adoption differently in these two countries.

The collected data was analyzed using statistical methods, including frequency analysis, descriptive analysis, correlation analysis, and regression analysis. Frequency analysis was conducted to understand the distribution of respondents across different demographic categories and Takaful operators. Descriptive statistics were used to summarize the central tendencies and dispersion of the key constructs. Correlation analysis was performed to determine the strength and direction of the relationships between the predictors and behavior intention. Finally, regression analysis was employed to assess the predictive power of the independent variables on behavior intention.

The statistical analysis was carried out using SPSS software, which facilitated the calculation of mean values, standard deviations, correlation coefficients, and regression parameters. The analysis provided insights into the significance of each predictor in influencing the behavior intention toward drone adoption in the Takaful industry in both Malaysia and Indonesia.

4. Results

The frequency analysis revealed that the distribution of respondents across various demographic and professional categories provides a diverse representation of the takaful industry. Out of the total respondents, 40 were male and 28 were female. A majority of the respondents were employed by Great Eastern Takaful Berhad (20 respondents), followed by Takaful Ikhlas General Berhad with 13 respondents, Etiqa Family Takaful Berhad with 11 respondents, and Etiqa General Takaful Berhad with 10 respondents. In terms of experience, most respondents had been working in the takaful industry for 5 years or less (28 respondents) or between 6 to 10 years (25 respondents). Only 12 respondents had more than a decade of experience, specifically between 11 to 15 years. The departments represented in the study varied, with the Shariah department having the highest number of respondents (17), followed by the Actuary department (12 respondents), Customer Service (10 respondents), and both Finance and Marketing departments, each with 9 respondents. The age distribution indicated that the majority of respondents were aged between 31-40 years old (40 respondents), followed by those in the 41-50 age group (18 respondents), and only 8 respondents were aged below 30.

Profile of Respondents: Table 1 displays a summary of the characteristics of the total sample of takaful providers who participated in the study.

Table 1: Demographic Profile

VARIABLE	FREQUENCY	PERCENTAGE
GENDER		
Males	28	41.17%
Females	40	58.82%
Total	**68**	**100%**
TAKAFUL OPERATOR		
Afi Syariah	1	1.47%
Aia Public Takaful Bhd	2	2.94%
Allianz Syariah (Allisya)	3	4.41%
Asuransi Bumiputera Syariah	5	7.35%
Asuransi Sinar Mas Syariah	1	1.47%
Asuransi Syariah Aia	2	2.94%
Asuransi Syariah Astra	1	1.47%
Asuransi Syariah Bni Life	3	4.41%
Asuransi Syariah Manulife	4	5.88%
Asuransi Syariah Panin	2	2.94%
Asuransi Takaful	4	5.88%
Etiqa Family Takaful Berhad	2	2.94%
Etiqa General Takaful Berhad	10	14.71%
Fwd Takaful Berhad	1	1.47%
Great Eastern Takaful Berhad	5	7.35%
Hong Leong Msig Takaful Berhad	2	2.94%
Prudential Bsn Takaful Berhad	1	1.47%
Prusyariah	4	5.88%
Sun Life Malaysia Takaful Berhad	2	2.94%
Syarikat Takaful Malaysia Am Berhad	3	4.41%
Syarikat Takaful Malaysia Keluarga Berhad	2	2.94%
Takaful Ikhlas Family Berhad	1	1.47%
Takaful Ikhlas General Berhad	3	4.41%
Others	1	1.47%
Xx Trial	1	1.47%
Zurich General Takaful Malaysia Berhad	1	1.47%
Zurich Takaful Malaysia Berhad	1	1.47%
Total	**68**	**100%**
Years in the Takaful Industry		
11 – 15 years	12	17.65%
16 – 20 years	3	4.41%
5 years and below	29	42.65%
6 – 10 years	16	23.53%
Others	8	11.76%
Total	**68**	**100%**
Department		
Actuary	5	7.35%
Customer Service	3	4.41%
Finance	8	11.76%
Investment	6	8.82%
Marketing	9	13.24%
Product Development	8	11.76%
Shariah	6	8.82%
Others	23	33.82
Total	**68**	**100%**
Age		
31 – 40 years old	22	32.35%
41 – 50 years old	15	22%

51 – 60 years old	6	8.82%
Below 30 years old	24	35.29%
Others	1	1.47%
Total	**68**	**100%**

Descriptive Statistics: Descriptive analysis of the key variables in Table 2 provided insights into the respondents' perceptions and attitudes. Performance expectancy had a high mean value of 4.41, suggesting that on average, respondents had high expectations of performance, with moderate variability (standard deviation of 0.68). Effort expectancy also showed moderate variability, with a mean value of 3.98 and a standard deviation of 0.83. Social influence exhibited a slightly wider dispersion, with a mean of 3.88 and a standard deviation of 0.92. Facilitating conditions had a mean of 3.73, reflecting moderate variability in respondents' perceptions (standard deviation of 0.81). Perceived cost was also high, with a mean value of 4.21 and a standard deviation of 0.69. The analysis of social cost and benefit yielded a mean of 4.15 and a standard deviation of 0.77, indicating a consistent perception among respondents. Finally, the alignment with Maqasid Shariah was notably high, with a mean value of 4.68 and a low standard deviation of 0.45, while behavior intention had a mean of 3.99 and a standard deviation of 0.83, indicating moderate variability in respondents' behavioral intentions.

Table 2: Descriptive Statistics

	Descriptive Statistics		
Variable	**Factor Name**	**Mean**	**Std. Dev.**
PE	Performance Expectancy	4.433	0.751
EE	Effort Expectancy	3.974	0.879
SI	Social Influence	4.047	0.964
FC	Facilitating Conditions	3.908	0.792
PC	Perceived Cost	4.198	0.622
SCBA	Social Cost and Benefit Analysis	4.137	0.773
MS	Maqasid Shariah	4.702	0.439
BI	Behavior Intention	3.963	0.916

The Correlation Analysis: The correlation analysis Table 3 identified the relationships between key variables and behavior intention. Performance expectancy was positively correlated with behavior intention (r = 0.671), suggesting that higher performance expectancy is associated with higher behavior intention. Effort expectancy also showed a positive correlation with behavior intention (r = 0.526). Social influence had the strongest positive correlation with behavior intention (r = 0.865), indicating a significant impact on behavior. Facilitating conditions were also positively correlated with behavior intention (r = 0.738), suggesting that better-facilitating conditions are associated with higher behavior intention. Perceived cost (r = 0.460) and social cost and benefit analysis (r = 0.601) were both positively correlated with behavior intention, albeit to a lesser extent. The alignment with Maqasid Shariah, while positively correlated with behavior intention, had the lowest correlation coefficient (r = 0.325), indicating a weaker relationship.

Table 3: Correlation Analysis

Variable	Factor Name	Correlation with Behavior Intention	P-value
PE	Performance Expectancy	0.671	0.01
EE	Effort Expectancy	0.526	0.05
SI	Social Influence	0.865	0.00
FC	Facilitating Conditions	0.738	0.00
PC	Perceived Cost	0.46	0.05
SCBA	Social Cost and Benefit Analysis	0.601	0.01
MS	Maqasid Shariah	0.325	0.10

Table 4: Regression Analysis

Variable	Factor Name	Coefficient	P-value
PE	Performance Expectancy	0.0975	0.418

EE	Effort Expectancy	-0.0618	0.488
SI	Social Influence	0.6975	0.00
FC	Facilitating Conditions	0.3474	0.00
PC	Perceived Cost	-0.0854	0.45
SCBA	Social Cost and Benefit Analysis	-0.092	0.387
MS	Maqasid Shariah	-0.097	0.517

The Regression Analysis: The regression analysis Table 4 provided valuable insights into the factors influencing behavior intention. The model exhibited strong predictive power, with an R-squared value of 0.791, indicating that 79.1% of the variance in behavior intention was explained by the independent variables. The adjusted R-squared was 0.767, and the overall model was statistically significant, supported by an F-statistic of 32.53 and a P-value of 3.66e-18. Among the predictors, social influence emerged as a key factor, showing a strong positive effect on behavior intention with a coefficient of 0.6975 and a P-value of 0.000. Facilitating conditions also significantly impacted behavior intention, with a coefficient of 0.3474 and a P-value of 0.003. In contrast, performance expectancy, although positive, was not a significant predictor, with a coefficient of 0.0975 and a P-value of 0.418. Similarly, effort expectancy had a negative but insignificant effect, with a coefficient of -0.0618 and a P-value of 0.488. Perceived cost (-0.0854), social cost and benefit analysis (-0.0921), and Maqasid Shariah (-0.0972) all had negative coefficients, but none of these variables were statistically significant, as indicated by their respective P-values of 0.451, 0.387, and 0.517. These findings highlight the importance of social influence and facilitating conditions in shaping behavior intention, while other factors did not demonstrate significant predictive power in this model.

Hypothesis Test: In Table 5, the hypotheses testing revealed that social influence, facilitating conditions, and social cost and benefit significantly impact overall behavior intention, leading to the rejection of the null hypotheses for these variables. However, performance expectancy, effort expectancy, perceived cost, and Maqasid Shariah did not have a significant effect on behavior intention, leading to a failure to reject the null hypotheses for these variables. These findings underscore the importance of social factors, enabling conditions, and social cost-benefit considerations in shaping behavior intentions within the context of the takaful industry.

Table 5: Hypothesis Test

Hypothesis	Null Hypothesis (H0)	Alternative Hypothesis (H1)	Result
H1	Performance expectancy does not have a significant effect on overall behavior intention.	Performance expectancy has a significant effect on overall behavior intention.	Fail to reject H0 (P-value: 0.418)
H2	Effort expectancy does not have a significant effect on overall behavior intention.	Effort expectancy has a significant effect on overall behavior intention.	Fail to reject H0 (P-value: 0.488)
H3	Social influence does not have a significant effect on overall behavior intention.	Social influence has a significant effect on overall behavior intention.	Reject H0 (P-value: 0.000)
H4	Facilitating conditions do not have a significant effect on overall behavior intention.	Facilitating conditions have a significant effect on overall behavior intention.	Reject H0 (P-value: 0.000)
H5	Perceived cost does not have a significant effect on overall behavior intention.	Perceived cost has a significant effect on overall behavior intention.	Fail to reject H0 (P-value: 0.451)
H6	Social cost and benefit do not have a significant effect on overall behavior intention.	Social cost and benefit have a significant effect on overall behavior intention.	Fail to reject H0 (P-value: 0.387)
H7	Maqasid Shariah does not have a significant effect on overall behavior intention.	Maqasid Shariah has a significant effect on overall behavior intention.	Fail to reject H0 (P-value: 0.517)

(*p<0.05; **p<0.001)

Discussion

The results of this study offer important new perspectives on the elements affecting the acceptance of drone technology in the Takaful sector in Malaysia and Indonesia. While performance expectation and effort expectation were found to be less important in this context, the results underline the important part of social influence and facilitating conditions in shaping the behavior intention of Takaful practitioners towards drone adoption.

Social Influence as a key driver

The study showed that social influence is a strong predictor of behavior intention, meaning that the decision-making process of professionals depends much on the impressions and endorsements of peers, business leaders, and influencers. This result fits earlier studies stressing the need for social proof and group behavior in the acceptance of technology (Venkatesh et al., 2003). In the Takaful sector, where trust and community are fundamental, the endorsement of drone technology by eminent personalities can greatly increase its acceptance (Yoo et al., 2023)... This implies that plans meant to boost drone acceptance should concentrate on using the power of important industry players to establish credibility and promote general acceptance among professionals.

The impact of Facilitating conditions

Facilitating conditions were also found to have a significant positive impact on behavior intention. Good infrastructure, training and support systems will ensure to succession of the application of drone technology in the Takaful industry. In addition, a supportive environment is important as individuals are more likely to accept and adopt new technologies when they feel equipped and supported (Sitorus et al., 2016; Kauffman & Techatassanasoontorn, 2010). It also depends on funding for technical support, regulatory framework and training programs that suit to Takaful industry that have a complex regulatory landscape (Ayamga et al., 2021; Jones, 2017; Ayamga et al., 2020).

Implications for the Takaful Industry

The findings show that promoting and implementing drone technology can have positive significance for Takaful stakeholders. Social factors have a major influence on marketing and promotional efforts which both need to focus on developing social proof via endorsements from the market leader and early adopters. Indeed, it is necessary to ensure the availability of infrastructure and support systems are in the right order when to overcome barriers to adoption.

The Takaful industry in Malaysia and Indonesia will continuously evolve and these findings provide a framework for successfully integrating drone technology into their operations. The key drivers from the findings will enhance Takaful operators on their operational efficiency, improve customer service, and get the upper edge in the market.

Contextual Factors

Furthermore taken into account should be the cultural and legal variations between Malaysia and Indonesia, which might affect the generalisability of these results. Both nations have different legal systems and cultural attitudes towards the acceptance of technology, which could influence how drone technology is seen and applied inside the Takaful sector. Malaysia, for example, has a more advanced drone regulatory system than Indonesia (Muhamat et al., 2021; Rahman et al., 2019; Saputra, 2020). Culturally, although both nations have Islamic values, variances in risk appetite and technology acceptance among stakeholders could exist [cite a source discussing cultural differences and technology acceptance in Southeast Asia or specifically in these countries](Aulia et al., 2020; Diniyya et al., 2021).

5. Managerial Implications and Recommendations

This study has demonstrated valuable findings on the adoption of drone technology in the context of the Takaful industry in Malaysia and Indonesia. Nevertheless, it is important to identify the limitations for future research works. This study only focused on Malaysia and Indonesia which is probably insightful to both countries but still further research is needed to know whether the findings hold in other countries with different cultural

contexts and regulatory landscapes towards Takaful and usage of the drone technology. Even though the sample size provided valuable data still a large and more diverse sample from different Takaful companies and professional positions probably can increase the generalizability of the findings. Moreover, combined with the qualitative data could provide richer insights into the motivations and concerns surrounding drone adoption, complementing the existing data. Lastly, with the evolution of drone technology, future research needs to consider the other areas that impact emerging technologies such as artificial intelligence and blockchain, on drone applications within Takaful.

This paper offers an insightful analysis of the acceptance of drone technology in the Takaful sectors of Malaysia and Indonesia. Still, it's important to recognize some constraints to direct the next studies. This particular study concentrated especially on Indonesia and Malaysia. Although perceptive for these countries, more study is required to ascertain whether the results apply to other areas with different cultural settings and legal environments for drone operation. Furthermore, even if the given sample size offers useful information, a larger, more varied sample spanning many Takaful businesses and professional roles could improve the generalisability of the results. Moreover, adding qualitative data via focus groups or interviews would enhance the current data by offering a more complex understanding of the reasons behind and worries about drone acceptance. Lastly, given the fast development of the drone sector, the next studies should take into account how newly developed technologies like artificial intelligence and blockchain would affect drone uses inside Takaful.

Building on these factors, the next studies might investigate several interesting directions. Comparative studies across several nations with different cultural and legal environments would help to clarify the elements influencing drone acceptance in Takaful using cross-cultural analogs. Longitudinal studies tracking the acceptance and influence of drone technology over time would provide insightful analysis of the long-term consequences on the Takaful sector. Further study is required to investigate the ethical consequences and create thorough legislative frameworks for drone use inside the Takaful sector, to guarantee responsible and sustainable implementation given the ethical and regulatory complexity. Last but not least, future research could look at the particular effects of drone technology on Takaful operations—that is, efficiency increases, cost savings, and customer satisfaction—so measuring the advantages.

Overcoming the limitations can provide a more comprehensive understanding of the potential of drones within the Takaful industry. Future research should focus on expanding the scope of this study to include other regions with different cultural and regulatory environments. A larger, more diverse sample would improve the generalizability of the findings. Additionally, as technology evolves, future studies should investigate the impact of emerging technologies such as artificial intelligence and blockchain on drone adoption in the Takaful industry. Qualitative studies, such as focus groups or interviews, could provide deeper insights into the motivations and concerns surrounding drone adoption, complementing the existing quantitative data.

Conclusion

In conclusion, this study gives insightful analysis of how drone technology acceptance influences the Takaful business in Malaysia and Indonesia. The findings of the study also indicate the need for social influence and facilitating conditions compared to less relevant performance expectations and effort expectations. Indeed, these findings can provide a guideline to the stakeholders when developing strategies to motivate drone adoption, especially improving the industry's ability to explore this innovative technology.

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Students' Satisfaction with the Choice of Public Transport Mobility in UiTM Puncak Alam

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Abstract: Transportation is essential for facilitating movement and contributing to economic development. This study aims to measure student satisfaction with public transportation mobility at UiTM Puncak Alam. Understanding the level of satisfaction derived from transportation services is crucial for enhancing student experiences. The main focus of this research is to identify the factors influencing student satisfaction with public transport services, specifically examining reliability, convenience, frequency, and safety in UiTM Puncak Alam. A correlation study was conducted to explore the relationships between these factors and student satisfaction. The research utilized a non-probability convenience sampling method, distributing a questionnaire to 217 students from the Faculty of Business and Management. Data collection occurred over three months, from October 2022 to December 2022, using online questionnaires. The findings indicate that comfort, frequency, and safety significantly influenced student satisfaction. Numerous students expressed their dissatisfaction with the old buses, inconsistent service schedules, and safety issues. These elements were discovered to influence students' selection of public transportation and their overall contentment. The research also highlighted concerns like bus conditions, driver behavior, and punctuality, all of which affect student satisfaction and academic achievement. Based on these findings, the study suggests increasing the bus fleet, enhancing service frequency, and strengthening safety measures to better address student needs and boost their overall satisfaction with public transportation at UiTM Puncak Alam.

Keywords: *Students Satisfaction, Public Transport, Mobility, Comfortability, Frequency, Safety*

1. Introduction and Background

Students living on campus at Universiti Teknologi MARA (UiTM) Puncak Alam in Selangor rely heavily on public transportation, particularly bus services, for their daily commute. According to university policy, students residing in campus housing are not permitted to bring personal vehicles, except for motorcycles, and are encouraged to use the provided bus services. This policy aims to reduce traffic congestion by minimizing the number of vehicles on campus. However, this reliance on bus services presents challenges. Many students experience long waiting times, often up to 30 minutes, due to high demand and long queues. Consequently, some students opt for alternative modes of transportation, such as ride-sharing services like Grab or taxis, which may offer more convenience but can be costly. Referring to Liu, Li, & Zhang, (2020). evaluates the effectiveness of transportation policies implemented at the University of Michigan and their impact on public transit usage within the campus community. It provides insights into how university-specific policies influence students' and staff's transportation choices and the broader implications for sustainable campus mobility.

Overall this study aims to assess student satisfaction with the public transport services at UiTM Puncak Alam. The study seeks to understand the factors that influence satisfaction and identify areas for improvement in the university's public transport offerings.

2. Literature Review

Public Transport Mobility Satisfaction

According to Mokhtarian & Cao, (2020). Examines various studies on travel satisfaction related to public transportation. It also discusses the factors influencing public transport satisfaction, such as service quality, accessibility, and personal expectations, and highlights the gap in current research. Apart from that, referring to Currie & Delbosc (2021), provide a comprehensive overview of research on public transport satisfaction, focusing on user experience, service quality, and the impacts of various factors on satisfaction levels, it also addresses emerging trends and future research directions.

Effective public transportation is crucial for ensuring student satisfaction in university settings. According to

Shaaban (2016), implementing efficient bus routes that pick up and drop off students at specific times can significantly reduce waiting times and improve overall satisfaction. By optimizing bus routes and schedules, universities can minimize the likelihood of missed classes, thereby encouraging more students to use public transportation (Aris et al., 2019). However, increasing bus frequency often requires substantial investment, including purchasing more buses and hiring additional drivers, which can be financially challenging.

Safety is another critical factor influencing student satisfaction with campus transportation. Hashim (2013) emphasized the importance of maintaining a safe environment for students, which can be achieved by implementing safety technologies such as RFID and GIS. These technologies help monitor bus movements and student behavior, providing data that can enhance campus safety (Talib et al., 2018). Such measures are essential, especially on campuses that allow public vehicles to pass through, as they help prevent accidents and ensure a secure environment for students (Eastern Kentucky University, 2022).

Efficiency in public transportation is also a key determinant of student satisfaction. Fitzova et al. (2018) argued that reliable and user-friendly services are essential to attract and retain students as regular users of public transport. Aligning transportation services with student demand, enhancing the overall transit experience, and ensuring adequate coverage across campus can reduce the need for personal vehicles, lower transportation costs, and decrease stress levels associated with commuting (Cities Climate Leadership Group, 2021; Study International, 2019). Moreover, efficient transportation reduces parking and traffic congestion, contributing to a more sustainable campus environment (Force, 2004).

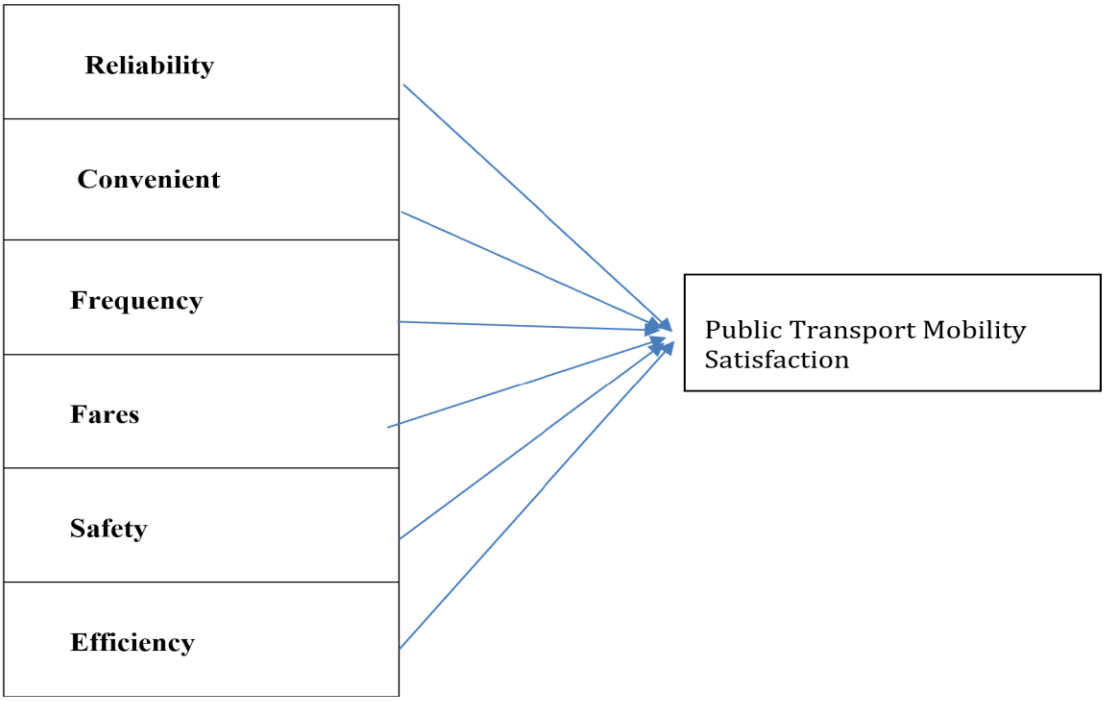


Figure 1 : Research Framework

3. Research Methodology

This study employs a descriptive research design to investigate students' satisfaction with public transport mobility at UiTM Puncak Alam. The aim is to explore the relationships between independent variables (reliability, convenience, frequency, safety) and the dependent variable (student satisfaction). A correlational approach was used to assess how these factors relate to each other. By analyzing these relationships, the study aims to determine the significance and strength of the correlations between the chosen factors and student

satisfaction. This approach allows for a better understanding of the natural associations between these variables without manipulating the study environment. The research was conducted in a natural setting at UiTM Puncak Alam, ensuring minimal interference with regular student activities. This field-based approach helps maintain the authenticity of the responses. The study employed a cross-sectional design, with data collected at a single point in time, providing a snapshot of student's satisfaction levels during the research period.

Population and Sampling

The target population for this study consists of students enrolled at UiTM Puncak Alam, specifically those in the Faculty of Business Management. The study aims to understand the satisfaction levels of students using public transport services on campus. To achieve this, a sample was drawn from the broader student population.

Sampling Technique

Convenience sampling, a non-probability sampling method, was used to select participants for this study. This approach was chosen due to its practicality and efficiency, allowing the researchers to easily access and gather data from students in semesters 1 to 5 of the Business Management program. While this method does not provide a fully representative sample of the entire student population, it offers valuable insights within the constraints of time and budget.

Sample Size

A total of 217 students were surveyed for this study, providing a sufficient sample size to gain reliable insights into student satisfaction with public transport. This sample size was deemed appropriate to balance the need for accuracy and precision with the practical limitations of data collection. By targeting a specific group within the university, the study ensured that the sample was relevant and aligned with the research objectives.

Questionnaire Design

The questionnaire used in this study was divided into four sections: Section A covered Demographic information, Section B focused on Factors Influencing Public Transport Customer Satisfaction, Section C examined the Effects of Customer Satisfaction on Public Transportation, and Section D sought Recommendations to Improve Public Transport at UiTM Puncak Alam.

To ensure the reliability and validity of the questionnaire, the constructs were derived based on findings from previous research. Each construct's reliability was confirmed by achieving a reliability index greater than 0.60, indicating acceptable internal consistency. The dimensions used in the questionnaire correspond to the study's hypotheses, ensuring alignment with the research objectives.

Measurement

A Likert scale was used to measure respondents' attitudes, opinions, and behaviors. This scale, named after Rensis Likert, allows participants to indicate their level of agreement with various statements on a numerical scale, typically ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Likert scales are commonly used in social sciences and market research due to their simplicity and effectiveness in capturing a wide range of attitudes and opinions. However, it is noted that Likert scales may be susceptible to social desirability bias, where respondents may provide socially acceptable responses rather than honest ones.

4. Results

The study employed several analytical methods to address the research objectives. The analysis began with a reliability test to assess the consistency of the questionnaire, followed by descriptive analysis to examine the demographic characteristics of the respondents. Finally, advanced statistical methods, including t-tests, regression, and correlation analyses, were used to explore the relationships between variables.

Reliability Test

The reliability test showed a high internal consistency, with a Cronbach's alpha coefficient of 0.849, indicating that the questionnaire items were reliable and measured the intended constructs consistently.

Descriptive Analysis

The descriptive analysis covered various respondent characteristics, including age, semester, residency, vehicle ownership, and transportation allocation. Out of 217 respondents, 12% were aged 17-19 years, 51.2% were aged 20-22 years, and 36.9% were aged 23-25 years. These demographics provided a comprehensive overview of the student population sampled in the study.

Data Analysis

Table 1: Table of Model Summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.706[a]	.499	.482	.856

Regression Analysis

The regression analysis results demonstrate the relationship between multiple independent variables and the dependent variable, students' satisfaction. The model summary indicates that 49.9% of the variance in the dependent variable (students' satisfaction) is explained by the independent variables. This is indicated by the R Square value of 0.499.

Table 2: ANOVA

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	152.220	7	21.746	29.681	.000[b]
	Residual	153.125	209	.733		
	Total	305.346	216			

The ANOVA table shows that the overall regression model is statistically significant, with a significance value (p-value) of 0.00, which is well below the threshold of 0.05.

Table 3: Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.133	.425		-2.668	.008
	1. The public transport service is usually reliable	.410	.086	.304	4.773	.000
	2. The public transport routes are convenient for me	.183	.078	.152	2.340	.020
	3. The public transport service is frequent	.212	.077	.192	2.764	.006
	4. The public transport staff is always helpful	.088	.075	.075	1.184	.238
	5. The public transport fare is more reasonable compared to other modes of transportation	.210	.076	.147	2.744	.007
	6. The safety of certain mode of public transport such as e-hailing makes me comfortable using it	.038	.080	.028	.477	.634
	7. The ease of getting mobility using public transport specifically (e-hailing), makes me want to use it more compared to other public transport	.146	.088	.098	1.661	.098

a. Dependent Variable: 4. I will keep on using public transport as my main transportation in UiTM

In unstandardized coefficients in Table 3, for each unit increase in B1, students' satisfaction will increase by 0.410 units. While for each unit increase in B2, students' satisfaction willincrease by 0.183 units. While for each unit increase in B3, students' satisfaction will increase by 0.212 units. For each unit increase in B4, students' satisfaction will increase by 0.088 units. While for each unit increase in B5, students' satisfaction will increase by 0.210 units. For each unit increase in B6, students' satisfaction will increase by 0.038 units. While for each unit increase in B7, students' satisfaction will increase by 0.146 units

Correlation Analysis

The correlation analysis explores the relationships between different styles and student satisfaction. The results indicate various levels of correlation, ranging from negligible to low positive, as outlined below.

Table 4: Table of Correlations

Correlations

		1. The public transport service is usually reliable	2. The public transport routes are convenient for me	3. The public transport service is frequent	4. The public transport staff is always helpful	5. The public transport fare is more reasonable compared to other modes of transportation	6. The safety of certain mode of public transport such as e-hailing makes me comfortable using it	7. The ease of getting mobility using public transport specifically (e-hailing), makes me want to use it more compared to other public transport
1. The public transport service is usually reliable	Pearson Correlation	1	.531**	.568**	.424**	.293**	.158*	.191**
	Sig. (2-tailed)		.000	.000	.000	.000	.020	.005
	N	217	217	217	217	217	217	217
2. The public transport routes are convenient for me	Pearson Correlation	.531**	1	.559**	.446**	.317**	.323**	.236**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000
	N	217	217	217	217	217	217	217
3. The public transport service is frequent	Pearson Correlation	.568**	.559**	1	.559**	.302**	.282**	.226**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.001
	N	217	217	217	217	217	217	217
4. The public transport staff is always helpful	Pearson Correlation	.424**	.446**	.559**	1	.216**	.248**	.388**
	Sig. (2-tailed)	.000	.000	.000		.001	.000	.000
	N	217	217	217	217	217	217	217
5. The public transport fare is more reasonable compared to other modes of transportation	Pearson Correlation	.293**	.317**	.302**	.216**	1	.267**	.219**
	Sig. (2-tailed)	.000	.000	.000	.001		.000	.001
	N	217	217	217	217	217	217	217
6. The safety of certain mode of public transport such as e-hailing makes me comfortable using it	Pearson Correlation	.158*	.323**	.282**	.248**	.267**	1	.469**
	Sig. (2-tailed)	.020	.000	.000	.000	.000		.000
	N	217	217	217	217	217	217	217
7. The ease of getting mobility using public transport specifically (e-hailing), makes me want to use it more compared to other public transport	Pearson Correlation	.191**	.236**	.226**	.388**	.219**	.469**	1
	Sig. (2-tailed)	.005	.000	.001	.000	.001	.000	
	N	217	217	217	217	217	217	217

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Reliable Style: Shows a negligible positive correlation with student satisfaction ($r = .191$, $p = .005$).
Convenient Style: Exhibits a negligible positive correlation with student satisfaction ($r = .236$, $p < .05$).
Frequency Style: Also shows a negligible positive correlation with student satisfaction ($r = .226$, $p = .001$).
Staff Attitude Style: Displays a low positive correlation with student satisfaction ($r = .388$, $p < .05$).
Fare Style: Reveals a negligible negative correlation with student satisfaction ($r = -.219$, $p = .001$).
Safety Style: Indicates a low positive correlation with student satisfaction ($r = .469$, $p < .05$).

5. Managerial Implications and Recommendations

To enhance public transportation services on campus and improve overall student satisfaction, the following recommendations are proposed:

Increase Frequency and Reliability of Buses and Shuttles

To enhance the quality of campus public transportation, it is crucial to increase the frequency and reliability of buses and shuttles. This can be achieved by expanding the fleet size and implementing a real-time tracking system that enables students to monitor bus locations. Such measures will allow students to better plan their trips and reduce waiting times, as they will receive timely updates about bus arrivals and departures. Additionally, aligning bus schedules with class timings and peak usage periods will ensure transportation availability when most needed, alleviating concerns about inadequate service.

Expand the Accessibility of Service Areas

Improving campus transportation requires expanding the service areas to include locations such as off-campus housing, shopping centers, and recreational sites. This expansion will make public transportation more accessible and attractive to students, particularly those who live off-campus or regularly travel to popular destinations. An expanded service area will not only increase convenience but also reduce the number of private vehicles on the road, easing traffic congestion and lowering air pollution levels.

Utilize Technology for Enhanced Transportation Services

Leveraging technology can significantly enhance the convenience and efficiency of campus transportation. Introducing a mobile app tailored for students would enable them to access real-time bus tracking, view schedules, and plan trips more effectively. Additionally, incorporating electronic fare systems will streamline payment processes, reducing wait times at bus stops and providing a more seamless experience for all users.
By implementing these recommendations, campus transportation services can become more reliable, accessible, and user-friendly, leading to improved satisfaction among students and a more sustainable campus environment.

Conclusion

This study examined student satisfaction with public transportation mobility at UiTM Puncak Alam, with a focus on key factors such as reliability, convenience, frequency, and safety. Understanding these elements is essential to enhancing the quality of transport services and meeting the needs of the student population.

The research highlighted several areas that require attention to improve overall satisfaction, including the condition of buses, service schedules, and safety measures. It also underscored the importance of aligning transport services more closely with student expectations and the need to encourage greater use of public transport.

Based on these insights, the study proposes targeted recommendations to increase the frequency and reliability of services, expand the coverage area, and integrate technology to enhance the convenience and efficiency of public transport. Implementing these recommendations can lead to a more positive transportation experience for students, fostering a sustainable and student-friendly campus environment.

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The Impact of Health Communication Competence towards Electronic Word of Mouth (e-WOM) in Health Information Sharing among Internet Users in Malaysia

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Abstract: When the world was hit by COVID-19, everything changed, especially the norms and regular everyday activities. Through the previous implementation of the Movement Control Order (MCO), Malaysians have now developed a habitual behavior of using the internet to casually engage in their daily routines, ranging from using e-commerce to buy necessities to using the Internet to book a health-related appointment with a clinic. In other words, they are now more comfortable engaging with others through a more convenient way of using the Internet as their main platform of communication. This descriptive research has applied a cross-sectional approach where it was to determine the relationship between health communication competence and electronic word of mouth (e-WOM) among internet users in Malaysia. This study has selected the required 400 respondents through quota sampling where each of the four regions of Malaysia was represented by 100 samples. The instrument used for this study was a set of questionnaires consisting of three sections, starting from the demographic background, health communication competence and electronic word of mouth. The findings from the descriptive analysis have indicated that Malaysian internet users have fair health communication competence and correlational analysis findings have demonstrated that health communication competence and its components of adherence in communication, critical and participative communication, and active disease-related communication have significant relationships with the dependent variable. Nonetheless, the results from the multiple regression analysis have found that critical and participative communication was the sole and strongest predictor of electronic word of mouth in health information sharing. This research has fulfilled all three objectives and the findings have supported the four hypotheses formulated. Therefore, given the fact that there was scarce research conducted on this study, it will serve as a promising point to further explore the two variables involved.

Keywords: *Health communication competence, electronic word of mouth, adherence in communication, critical and participative communication, active disease-related communication.*

1. Introduction and Background

In this era of globalization, everyone can reach various types of information and feedback at their fingertips whether it is formal or informal. This has put everyone in an advantageous situation to freely express their honest review or experiences over certain health-related products and services to another interested party known as word-of-mouth (WOM). Traditionally, word-of-mouth is conducted through the help of parties involved by orally sharing health information from one to one. However, this rapid innovation of technology has subsequently created another version of WOM which is called electronic word of mouth (e-WOM) where it serves as a means of communication that could reach a wider mass audience through multiple social media platforms such as Facebook, Instagram, TikTok and others (Liu et al., 2024). According to Hether et al. (2014), in health care industry, the electronic word of mouth has been exponentially growing (Goyette et al., 2010). All the information can be shared through forums and focus group discussions. According to New Straits Times (2023), Malaysia ranked third in the top 10 countries with citizens spending the most time on the internet, with 8 hours and 6 minutes duration of spending per day. Undoubtedly, the Internet has had a huge influence on people's lives, which has transformed how people receive information. Through e-WOM, every user could leave their unbiased information, leaving them to decide whether to put it in a positive or negative light which could significantly impact potential users (Liu et al., 2022).

In the healthcare sector, it is crucial to effectively convey health-related information to give a better experience to patients. The science and art of using communication to improve the health and well-being of individuals

and populations is known as health communication (Ped Chef, 2024). To promote better health provision experiences, all parties involved, especially the patients and medical professionals are expected to have good communication competence. According to the U.S., competencies in the health sector are perceived as fundamental knowledge, abilities, and dispositions required in the practice of public health. This establishes a baseline for what is needed to carry out the fundamental duties of the public health system (McAlpine et al., 2024). Strong competencies in the healthcare industry support workforce development in the field of public health and can act as a springboard for medical professionals to better understand and address workforce development needs, boost productivity, get ready for accreditation, and improve community health (The Council on Linkages Between Academia and Public Health Practice, 2021). Health communication competence theory is commonly used in health research where there are three components of adherence in communication, critical and participative communication, and active disease-related communication (Farin et al., 2014). Applying the e-WOM method to communicate with people in the health industry is a great advantage to raising the standard of healthcare services and quality given by medical professionals to patients. When people can comprehend and apply health information, the main objective of health communication competence can be achieved (Caeiros et al., 2024). Thus, with the aid of health information through e-WOM, the level of medical-related comprehension among patients in Malaysia is expected to increase as they can exercise good judgment relating to their numerous health or medical situations.

Patient adherence is the degree to which a patient's behavior complies with the treatment regimen that was prescribed by the healthcare provider's recommendations. This implies that the patient and the healthcare provider agreed to a specific or systematic plan through a cooperative, shared decision-making process (Snyder & Haskard-Zolnierek, 2023). According to Thompson and Haskard-Zolnierek (2020), patient adherence is sometimes also known as patient compliance where the patient plays a more passive role in the healthcare professional's prescription of treatment. On the other hand, some patients are intentionally nonadherent (Thompson & Haskard-Zolnierek, 2020). This specifically happens when patients go against the healthcare provider's treatment regimen which could negatively affect their health performance and might worsen the symptoms (Snyder & Haskard-Zolnierek, 2023). In the context of the health sector, every medical professional wants his or her patients to get good health outcomes. For them to achieve this, a good communication strategy needs to be implemented. Wu et al. (2022) agreed that to improve patients' adherence, patient education programs frequently function as an intervention tool to improve their understanding of their conditions, and their desire to alter their behavior. The nurture of good health communication skills can be projected from this program which will highlight the build of a good rapport and relationship between patients and healthcare providers, subsequently could influence patient adherence. With the rapid advances in technology, the e-WOM method has been introduced which can influence the adherence in health information communication between users. These days, users tend to believe everything that appears on social media especially related to health information that can help them in making decisions relating to health information (AlMuammar et al., 2021). First-rate communication by healthcare providers establishes trust between healthcare providers that could influence more patients to become less nonadherent (Sharkiya, 2023).

Moving to the second component, critical and participative communication also plays a significant role in promoting electronic word-of-mouth in health information sharing among Malaysians. The rise in the number of patients with health disparities comes from the inequality of information where it fails to reach specific audiences (Estrada et al., 2018). Nonetheless, a robust and varied communication infrastructure may assist the 'underprivileged' patients to have good access to health information. This is because they are more prone to engage and believe in word-of-mouth specifically due to the inaccessibility of health information. With the help of communication interventions, health disparities can be focused on a one-to-one level to at least effectively address the issue at hand. Singhal (2004) Defined participatory communication as a dynamic and transforming process of interaction between individuals, groups and organizations that empowers people to fully explore their potential and actively participate in their well-being. According to The Critical Communications Association (2022), critical communication is communication services that are crucial for the success factor of the missions, tasks and operations of professionals who depend on reliable contact when necessary. Pavelić and Špiranec (2022) believe that participatory information has fundamentally transformed the theoretical knowledge of critical health information which has shifted from a one-dimensional, functional on individual skills to a multidimensional, collective approach that considers the social, cultural, economic, and political context. Effective and efficient health communication is crucial to make sure everyone in the future can easily

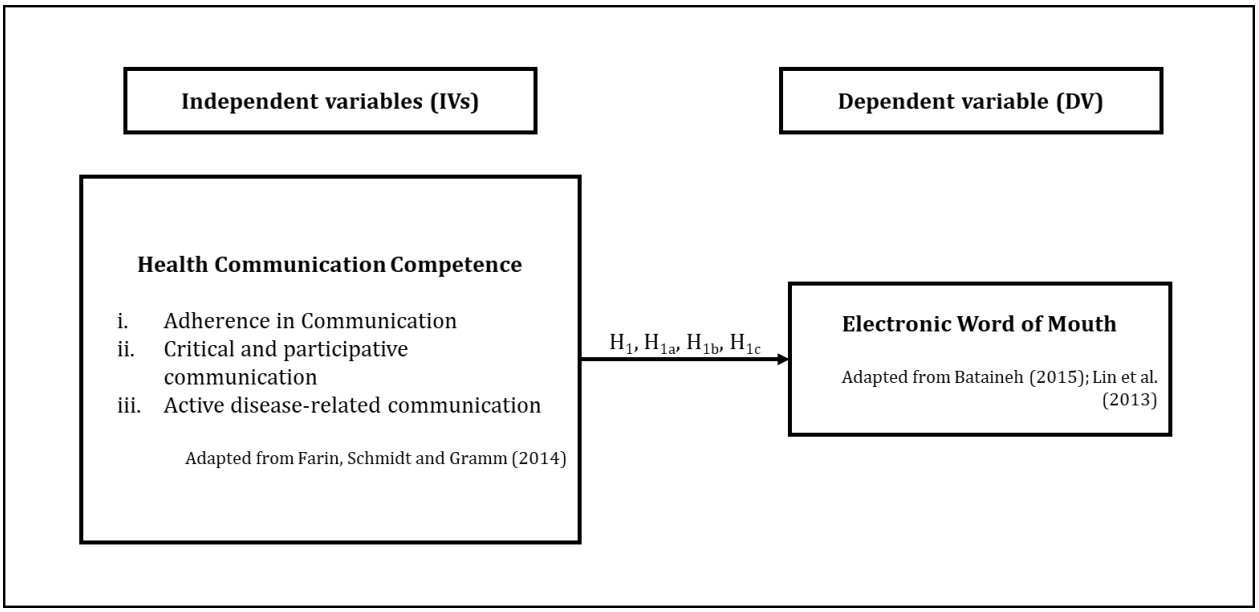
understand and act on health information though complexity in comprehending health information and messages is evident (Sharkiya, 2023). With the intervention of e-WOM in combating the disparities and inadequate infrastructure of health information, people with limited health information will receive sufficient health information that is easy to understand which directly contributes to well-informed decision-making and indirectly improves health communication strategies.

Apart from that, active disease-related communication is also another component that lies under the health communication competence theory. Active disease-related communication can be referred to as the proactive efforts made by individuals to orally disseminate disease-related information to the receiver of the intended messages. This is especially crucial when it comes to terminal or life-threatening diseases as individuals may need someone to seriously talk about the conditions, either for health advice or a support system. Individuals who are affected by cancer need effective communication between caregivers and patients to identify a specific communication need in developing future communication interventions. A study done by Li et al. (2020) Revealed that cancer patients and caregivers need communication targets, content, style, timing, and preferences. Gaining a more comprehensive comprehension of the distinct communication requirements of patients and carers will provide health professionals with precise insights for developing suitable treatments to assist cancer patients and carers. With strong and effective communication between patients and carers, both could navigate the challenges of cancer together since it promotes intimacy and improves the physical and mental health of patients and caregivers (Li et al., 2020). Healthcare services that prioritize and address the needs of patients and carers are crucial for enhancing favorable care results and perceptions of care quality, therefore fulfilling a major component of the patient-centered care objectives. (Kwame & Petrucka, 2021). Hence, two objectives were formulated for this research which was (1) To determine the level of health communication competence among internet users in Malaysia; and (2) To examine the relationship between health communication competence and electronic word of mouth in health information sharing among internet users in Malaysia; and (3) To identify the strongest predictor of electronic word of mouth in health information sharing among the health communication competence components.

2. Conceptual Framework

By integrating the literature review found, relating to this study, a conceptual framework was established on the relationship between health communication competence and electronic word of mouth (e-WOM) in health information dissemination among internet users (refer to Fig. 1).

Figure 1: Conceptual Framework on Relationship between Health Communication Competence and Electronic Word of Mouth



Based on the framework, four research hypotheses were suggested to meet the objectives of this study:

H_1 There is a significant relationship between health communication competence and electronic word of mouth in health information sharing among internet users in Malaysia.
H_{1a} There is a significant relationship between adherence to communication and electronic word of mouth in health information sharing among internet users in Malaysia.
H_{1b} There is a significant relationship between critical and participative communication and electronic word of mouth in health information sharing among internet users in Malaysia.
H_{1c} There is a significant relationship between active disease-related communication and electronic word of mouth in health information sharing among internet users in Malaysia.

3. Methodology

This descriptive study has adopted the cross-sectional types of investigation as it would enable the measurement of the relationship between respective variables in a defined population (Wang & Cheng, 2020). This was in line with the main objectives of this study which aimed to examine the relationships between each component of health communication competence (adherence to communication, critical participative communication and active disease-related communication) towards the electronic word of mouth in health information sharing among the internet users in Malaysia. Moreover, the researchers have applied the quota sampling technique to get the required sample size of 100 internet users for each geographical region in Malaysia. This sampling method was comparable to stratified random sampling as the sample will be selected from subgroups of a population, but it relies on convenience sampling to pick the samples, rather than random selection (Futri et al., 2022). Nonetheless, the study managed to get a good response rate whereby the responses collected for each region (central, southern, northern and east coast) cumulatively achieved 400 samples. In brief, the samples of this study can be considered as sufficiently good, reflecting the fulfillment of the criteria for requiring 50 to 100 samples to enable the study's advancement to a simple regression analysis (Hair et al., 2018). Besides, this study has used a set of questionnaires as the data collection instrument which comprised three sections, Section A: Demographic Details, Section B: Health Communication Competence and Section C: Electronic Word of Mouth in Health Information Sharing. The CoCo questionnaire was adapted in the study's instrument for health communication competence items (Farin et al., 2014) while the e-WOM questionnaire was adapted from Wan Zulkiffli et al. (2017). By using SPSS version 28.0, the reliability of this questionnaire was confirmed as the researchers had conducted a pilot study with the findings of every variable to have Cronbach's Alpha value of 0.7 and above.

4. Results

Descriptive Analysis of Health Communication Competence

This study aimed to identify the level of health communication competence among internet users in Malaysia which can be attained through a descriptive analysis. All items for health communication competence variable from each component of adherence to communication, critical participative communication and active disease-related communication were computed and transformed into mean scores. These scores were then interpreted by using the Best's Principle by Thaoprom (2004), into three categories poor, fair and good health communication competence. Poor HCC was represented by the mean scores of 1.00 to 2.00, while fair HCC was represented by the scores of 2.01 to 3.01. Lastly, the category of good HCC was represented by the scores of 3.02 to 4.00. Results from the analysis have presented a lower percentage of internet users with good HCC as compared to the ones with fair HCC (43.3%:55.5%), as can be referred to in Table 1. Hence, it can be concluded that internet users in Malaysia have a fair level of health communication competence, subsequently presumed the achievement of the first research objective.

Table 1: Level of Health Communication Competence (HCC) (n=400)

Poor (Mean score 1 – 2.00)*	Fair (Mean score 2.01 – 3.01)*	Good (Mean score 3.02 – 4.00)*
5 (1.2%)	222 (55.5%)	173 (43.3%)

*Interpreted by using Best's Principle by Thaoprom (2004)

Correlational Analysis of Health Communication Competence and Electronic Word of Mouth in Health Information Sharing

In determining the relationship between the independent and dependent variables of the study, a correlational analysis was conducted and tabulated in Table 2. The results were interpreted by using guidelines of strength and direction of coefficient values (r) by Cohen (Cohen, 1988). The findings have indicated two components of health communication competence encompassed critical and participative communication and active disease-related communication to be strongly, and positively related to health communication competence (r=.609, p<.001; r=.542, p<.001 respectively), leaving out adherence to communication as the only component with a moderate relationship with the electronic word of mouth in health information sharing (r=.490, p<.001). Additionally, the finding has shown that the overall health communication competence was significantly, strongly, and positively associated with the dependent variable (r=.596, p<.001). Thus, it can be concluded that the hypothesis of H_1, H_{1a}, H_{1b} and H_{1c} were supported by the findings, consequently marking the achievement of the second research objective.

Table 2: Correlations between Health Communication Competence and Electronic Word of Mouth in Health Information Sharing

Variables		Electronic Word of Mouth
Adherence to Communication	Correlation coefficient	.490**
	Sig. (2-tailed)	<.001
Critical and Participative Communication	Correlation coefficient	.609**
	Sig. (2-tailed)	<.001
Active Disease-related Communication	Correlation coefficient	.542**
	Sig. (2-tailed)	<.001
Health Communication Competence	Correlation coefficient	.596**
	Sig. (2-tailed)	<.001

** Correlation is significant at the 0.01 level (2-tailed)

Multiple Regression Analysis of Health Communication Competence and Electronic Word of Mouth in Health Information Sharing

Furthermore, in identifying the strongest predictor of electronic word of mouth in health information sharing among the components of health communication competence, a multiple regression analysis was conducted in the results were tabulated in Table 3. Based on the findings, the study identified to have no collinearity problem as the values of variance inflation factors (VIF) were smaller than 10 and the values of tolerance were smaller than one. With the R^2 value of .377 and significant F value of <.001, the analysis has indicated all components of health communication competence (adherence to communication, critical and participative communication and active disease-related communication) explained 37.7% of the variance (R^2) of electronic word of mouth in health information sharing. Over and above, the analysis showed that the critical and participative communication component was the sole and strongest predictor of the dependent variable (β=.486, p<.05). Other than that, adherence to communication and active disease-related communication was found to have no significant prediction over internet users' electronic word of mouth in health information sharing (β=.024, p>.05; β=.128, p>.05). Henceforth, this study has achieved its third research objective.

Table 3: Multiple Regression Analysis on Health Communication Competence and Electronic Word of Mouth in Health Information Sharing

Independent variables	Standardized Coefficients Beta	t	Sig.	Collinearity Statistics	
				Tolerance	VIF
Adherence to Communication	.024	.371	.711	.381	2.623
Critical and Participative Communication	.486*	6.293	<.001	.264	3.782
Active Disease-related Communication	.128	1.803	.072	.311	3.217
R^2 value			.377		
F			79.819		
Sig. F Value			<.001		

Discussion

Level of Health Communication Competence

According to Ministry of Health Malaysia (2023), people will be empowered to prevent misinformation through improved health communication. Nonetheless, this study has found higher number of Malaysians have fair health communication competence in general, which is not a desired situation as there will be challenges in reducing the potential indirect damage caused by inaccurate health information sharing among internet users. This figure appears to be incongruent with the growth of 79% of Malaysians becoming more health-conscious, resulting from the COVID-19 phenomenon (The Sun, 2023). Nonetheless, it was significantly evident when only 24% of 5,504 respondents chose to seek professional advice from the experts, where these people need to be able to effectively communicate with the medical experts when asking for advice (The Sun, 2023). By the low percentage, it is understandable that some people would rather put their money on something else that can be self-done, rather than having to interact with the experts with who they may have trouble communicating with may be due to insufficient health literacy to understand the whole health situation. This is supported by Ishikawa and Kiuchi (2010), where the health literacy of an individual should be defined and evaluated according to their ability to communicate health information appropriately to the receiver. Hence, it is fair to conclude that Malaysians need to have a sufficient level of health literacy for them to competently communicate about health matters.

The contextual knowledge on health will help them to accurately share information, either as a sender or receiver. This statistic may be incidentally related to how Malaysia, being one of the countries with various religions and cultures, is very much culturally influenced when it comes to communication as they tend to be extra careful to communicate to others especially when it comes to sensitive issues like medical conditions and situations. According to Mustaffa et al. (2018), the cultural value of saving face has influenced the Malaysians' communication style. The idea of being judged has prevented individuals from looking further into their medical or health-related questions. Electronic word of mouth has given the chance for these people to share their points of view or seek advice without being involved in stigmatization. According to Martin (2017), online conversation allows socially stigmatized individuals due to specific diseases for instance HIV, both sender and receiver to keep their identities anonymous. Therefore, it can be concluded that Malaysians are moving forward in developing good health communication competence though they may be culturally influenced by the whole scenario of being in a multi-racial country.

The Relationship between Health Communication Competence and Electronic Word of Mouth in Health Information Sharing

The findings have found that overall health communication competence and its components have a significant positive relationship with electronic word of mouth in health information sharing. This is because it plays a vital role in ensuring the information shared is accurate and impactful to potential online users. The dissemination process of the information would be smoother as competent communicators would be able to differentiate the accuracy of the information where the messages would be properly crafted to prevent misunderstanding and the spread of misinformation. This would promote the importance of having trustworthy health information as users will engage and build their trust around someone with credible and

clear communication especially when it comes to health conditions. Nonetheless, the definite focus is placed on the wrong side where people are prone to emphasize more on the information's accuracy rather than considering the deliverer's credibility on the subject matter. The accuracy of the information is debatable as it may be reflected in how the deliverer competently conveys the intended messages. According to Kreps (2023), the need to effectively respond to the medical components of the illness should be given more attention as compared to sharing pertinent health information regarding concerns, stress and social support. This has shown how competency in health communication should be rather prioritized and highlighted as it will make a difference in how the information is being transferred. Regardless, Xu et al. (2021) stated that there is a limited number of research done investigating the link between communication and health behavior.

Strongest Predictor of Electronic Word of Mouth in Health Information Sharing

Undeniably, it was expected that health communication competence may predict the e-WOM in health information sharing as the communication itself is a vital component in e-WOM. Nevertheless, the only predictor of e-WOM was found to be critical and participative communication where this component has highlighted the need for health communication to be reflective, inclusive and responsive to the diverse needs of individual patients. According to Estrada et al. (2018), individuals may have a better understanding of seeking health information through the participatory component in health communication as it can be used to identify the communication resources to be used in the health information dissemination process. Through this component, the parties involved in electronic word of mouth can enhance better understanding and empathy towards others, build trust in each other, and support better health outcomes. The participatory process in participative communication is useful in assisting the objective of health promotion by enabling individuals to act as opinion leaders in the community as the empowerment given to share their opinions with others (Estrada et al., 2018). According to Malikhao (2020), through participatory communication, individuals may act and have conversations democratically in discussing disease prevention, pollution, hazards and the promotion of a healthy lifestyle and, a clean and safe environment.

5. Conclusion and Recommendations

In conclusion, 55.5% of Malaysian internet users were found to have fair health communication competence while 43.3% of respondents perceived themselves to have good health communication competence. About the variables involved in this study, the overall health communication competence and its components have significantly and positively related to the e-WOM in health information sharing. Specifically, the component of critical and participative communication of health communication competence was found to be the only and strongest predictor of Malaysian internet users' e-WOM in health information sharing. Generally, this study has achieved all three objectives and the findings have corroborated the four suggested hypotheses.

In addition, it is suggested for future health-related research to deeply study health literacy and health communication as both would be equally important in influencing electronic word of mouth in health information sharing. In fact, in the literature review on word of mouth and health care services, 40% of the articles have emphasized that WOM communication has the characteristic of an informal particularity where post-consumption or post-purchase behavior was described in most messages. (Martin, 2017). Similarly, this is also supported by Soare et al. (2022), there are a limited number of articles about the contributing factors of the spread of word of mouth in health care services.

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Determinants of Student's Satisfaction Towards Bus Service Quality in UiTM Cawangan Selangor

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Abstract: Bus service around the campus is essential for the movement of students to undergo academic and co-curricular activities. Student satisfaction with the quality of the bus service provided needs to be considered. Hence, this study was conducted to determine the relationship between empathy, perceived value, reliability and timeliness and also to examine the greatest predictors among all four variables towards student satisfaction with the quality of bus services at UiTM Cawangan Selangor. In total, 200 undergraduate university students took part in the research as survey respondents. The SPSS version 29 was used to analyze the data. The findings from the analysis revealed that empathy, perceived value, reliability and timeliness were found significantly correlated with student satisfaction. In addition, the reliability was highly significant in determining student satisfaction. The practical and theoretical implications of understanding the characteristics of empathy, perceived value, reliability and timeliness will make university administrators and service providers more concerned with student satisfaction to improve the quality of bus services provided. In addition, the results of this study also aim to provide insights that can be taken into action by the parties concerned in improving service delivery and the overall student experience.

Keywords: *Empathy, perceived value, reliability, timeliness, student's satisfaction.*

1. Introduction and Background

Bus service on campus is significant, mostly for students to ensure smooth mobility and enhance the overall experience. At nearly all university campuses in Malaysia, students are highly dependent on public transportation. For public universities, it is a priority for university administrators to ensure the smooth movement of students on campus as suggested by Dell'Olio et al. (2011) where "having a good infrastructure will not be complete unless it is equipped with a transport system comparable to it". Therefore, lack of quality bus services will harm students as they may not be able to attend class, will not be able to use valuable time and effort and will make them feel unsafe to ride the bus. There are also other inconveniences such as unpleasant journeys, security issues, bus service delays and bus staff not being proactive in rectifying the negative perception of bus users on campuses that provide the service (Hashim et al., 2013). In addition, several factors have been stated by Bachok et al., (2014) and Rahim et al., (2021) that interfere with the quality of bus services, namely insufficient facilities, low intersection coverage, uncomfortable fleets, travel routines that limited, and long waiting times. Indirectly, a previous study by Noh (2015) found that the increase in complaints about the quality of bus services made the use of public buses by people decrease.

According to a previous study by Nash and Mitra (2019), "a pool of more than 15, 000 students from four institutions in North America, 31% of students depend on bus service for their main method of transportation". The availability of effective and reliable bus transportation facilities can impact students' decisions on whether to continue their studies at university or stop them because a large expense allocation during the study is transportation expenses. More or less the same situation also occurs in public universities in Malaysia, for example at Universiti Teknologi MARA (UiTM). Most of the students who live on campus and off campus depend on the bus service facility. This is because rules have been set by UiTM that students who get residential college facilities "are not allowed to bring their vehicles" to reduce the risk of other issues such as related to parking spaces around the campus (Hashim et al., 2013).

Concerning the travel options of on-campus students, the relevant research was carried out by Eboli and Mazulla (2007) in the area of Calabria University in Cosenza, Italy. They use a relatively similar group of respondents who are university students who travel by bus to and from the class. The results of their study show that the important variables for bus passenger satisfaction are frequency, reliability, information,

complaints, promotion, and staff. Besides, in 2019, "a study at Universiti Putra Malaysia (UPM) showed that approximately 42% of students were satisfied with the level of bus service provided". Only a small number of 2.8% stated that they were very dissatisfied with the available services probably due to the long waiting time, "the attitude of the bus drivers and the limited number of buses"(Shukri et al., 2019). In line with the outcomes of the past study, this study has focused on four determinants that are capable of impacting student satisfaction with the bus service quality at UiTM, Selangor Branch, Puncak Alam campus. Those four determinants are empathy, perceived value, reliability and timeliness. In general, each determinant has an impact on student satisfaction. It depends on the surrounding factors that affect the level of student's acceptance of the quality of bus service provided.

2. Literature Review

Student's satisfaction

"Satisfaction is defined as the happy feeling felt by an individual when something experienced fulfills his desires and needs. In other words, it is a state of mind experienced by a person based on the performance or results of something that meets his expectations" (Venkateswarlu et al., 2020). As previous studies have said, the efficiency of a service can be evaluated based on customer satisfaction. Thus, if they have received the desired service and have met their expectations, customers will continue to use the service. "The greater the difficulty in assessing service quality, the greater the difficulty in measuring satisfaction" (Sann & Siripipattaworn, 2024). The importance of quality aspects to customer loyalty or customer satisfaction will be directly or indirectly affected (Wilkins et al., 2007).

A study by Yang and Ding (2018) found that "students prioritize reliability and on-time service for campus commuting, which if there are delays and overcrowding will affect the decrease in satisfaction levels. The study emphasizes that student satisfaction and perception of bus service quality can increase if these aspects are improved." In general, study themes on public transport and the level of customer satisfaction concerning mobility have been carried out extensively (Faulk & Hicks, 2010; Nash, 1992). It can be explained by investigating certain indicators "of the quality of the product or service itself" (Stefano, 2015).

Empathy

Empathy generally refers "to being able to precisely perceive the emotional state of others and includes the residue that this competency has on the individual" (Spreng et al., 2009). In addition, empathy is the ability to sense a person's feelings and interpret what that person is thinking or feeling and why (Dorrington, 2020). As previous studies have said, empathy is an important determinant in increasing customer satisfaction. Customer satisfaction can be detected if they feel understood and appreciated through empathy. It has been supported by Sabir et al., (2014) where empathy is more closely related to customer satisfaction than other aspects.

Besides, when service employees show empathy, higher satisfaction can be felt by customers because it is likely to meet their emotional needs (Rogers & Farber, 2023). By incorporating empathy into the evaluation of bus service quality and student satisfaction, bus operators and university administrators can create a student-centered transportation system that meets the emotional and practical needs of students, ultimately contributing to a positive campus environment.

Perceived Value

Perceived value is how a customer sees the benefits and value of a product. Based on the research done by Sann & Siripipattaworn (2024), explains that perceived value refers to the amount of utility received by consumers as a result of using the product or service at the price they have paid. The perceived value of brands relating to quality, price and social dimensions that have a positive impact on consumer expectations (Fazal-e-Hasan et al., 2018). "Perceived value is known by terms of value (Monroe, 1990; Zeithaml, 1988) "or customer value (Buts & Goodstein, 1997). Moreover, perceived value involves an inconsistency between the received benefits and sacrifices.

McDougall and Levesque (2000), define perceived value as "the results or benefits customers receive about total costs which include the price paid plus other costs associated with the purchase". "The benefits include customer's preferred value. The sacrifices include monetary and non-monetary such as time, alternative goods

or alternative brands and self-experiences to sacrifices" (Dodds et al., 1991). In the context of bus service quality, perceived value can become a major difficulty, especially in university transportation services where student satisfaction and value perceptions are critical.

Reliability

On reliability, as stated by Parasuraman et al., (1988), relates to the capability to provide services as assured and precisely. According to McKnight et al. (1986), reliability is defined as the capability to offer transportation services with consistency and punctuality. Therefore, reliability is an important factor for customers. "Improving the reliability of bus service has the potential to increase the attractiveness of public transit to current and prospective riders" (Chen et al., 2009).

In addition, a positive relationship between reliability and student satisfaction was stated by Abu-Rumman and Qawasmeh (2022). The university administrators need to understand more about the reliability of the service to create a better service policy for the entire campus. In a study conducted by Ojo et al. (2015), they examined student satisfaction with campus shuttle bus services using the QUALBUS approach and found that reliability was the only factor that had a significant relationship with student satisfaction with campus shuttle bus services.

Timeliness

Recently, Huma et al., (2019) noted that timeliness refers to providing on schedule, whether delivering an order or conducting an activity for a service user. Service quality is the foundation that plays an important role in satisfying customers. By ensuring that the service or product is delivered promptly and directly, it can meet customer expectations, increase customer satisfaction and catalyze customer loyalty. Moreover, customers have specific expectations regarding the timeliness of bus services. Customer satisfaction tends to be higher if the bus schedule is on time and informs customers immediately if there are delays. On the other hand, dissatisfaction can occur if frequent delays and unreliable service schedules.

A study by Friedman and O'Neill (2019) emphasizes that punctual bus services directly influence and improve customer satisfaction and service perception. They agree that a positive image can be maintained by prioritizing on-time arrivals and departures and ensuring customers can rely on bus services for their travel needs. Wittmer and Witte (2010) have explored in their research that the relationship shows that service reliability, including timeliness, is a significant determinant of customer satisfaction in public transport.

According to Mulat (2017), the level of service or product quality is measured by assessing the user's perception. The quality of the service received by the customer can be evaluated during or after receiving the service. Different gaps in evaluation between perceived quality and what customers expect can improve existing service quality. "More interestingly, some researchers stated that studies on satisfaction with bus services are still relevant even today (Grisé & El-Geneidy, 2017; Munim & Noor, 2020; Li et al., 2021), including studies on satisfaction among students" (dos Reis Silveira et al., 2020; Eresia-Eke et al., 2020; Javid et al., 2021).

Hence, the purpose of this study was to determine the relationship between empathy, perceived value, reliability and timeliness and also to examine the greatest predictors among all four variables towards student satisfaction with the quality of bus services at UiTM Cawangan Selangor, to provide actionable insights to improve service delivery and the overall student experience. The researcher therefore stated the following hypothesis:

H_1: There is a positive relationship between empathy and student satisfaction.
H_2: There is a positive relationship between reliability and student satisfaction.
H_3: There is a positive relationship between perceived value and student satisfaction.
H_4: There is a positive relationship between timeliness and student satisfaction.

The relationship between the studied variables is depicted in Figure 1.

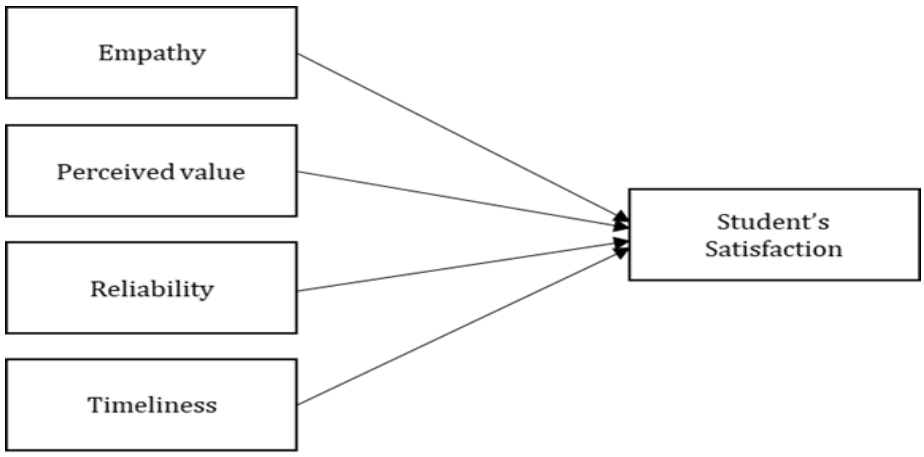


Figure 1: Conceptual Framework

3. Research Methodology

Instrument

A correlational research design was applied to the study. Data were collected via an online questionnaire from students at Universiti Teknologi MARA (UiTM) Cawangan Selangor. Four variables were used and each variable represents an essential factor in determining student's satisfaction with bus service quality. Respondents were asked to answer to questionnaire with a total of 45 items using instruments from multiple sources, on a five-point Likert scale (from 1 to indicate strongly disagree, to 5 to indicate strongly agree).

Statistical Analysis

Frequency, percentage, and continuous variables using mean and standard deviation were analyzed for categorical variables. Pearson's Product-Moment Correlation test was performed to examine the relationship among variables and this was followed by multiple regression analysis to determine the extent to which the dependent variables influence the measured outcome. Statistical Package for the Social Sciences Software (SPSS) version 29.0 was used to analyze the data.

4. Results

This section presents sets of results relating to the profile of respondents, and the relationship between empathy, perceived value, reliability and timeliness towards student satisfaction.

Profile of Respondents: A total of 200 students joined in the survey. Most respondents were female (n = 116, 58%), studying in the 5th semester (n = 46, 23%) and from the Faculty of Business and Management. A great number of respondents were also living in the university's arranged accommodation (n = 176, 88%).

Table 1: Correlational Analysis (N = 200)

	M	*SD*	1	2	3	4	5
1. Empathy	3.62	0.742	1.00				
2. Perceived value	4.06	0.718	0.640**	1.00			
3. Reliability	3.64	0.726	0.729**	0.604**	1.00		
4. Timeliness	3.09	0.941	0.423**	0.413**	0.619**	1.00	
5. Student's satisfaction	3.66	0.720	0.718**	0.607**	0.750**	0.465**	1.00

** p <.01

Correlational Analysis: The result of the analysis suggests all independent variables scores significantly correlated with student satisfaction. Empathy and reliability showed a strong positive relationship with student satisfaction (r = 0.718, p <.01; r = 0.750, p <.01 respectively), while perceived value and timeliness were

observed to have a moderate positive relationship with student satisfaction (r = 0.607, p <.01; r = 0.465, p <.01 respectively). The effect size for all correlations is according to Sekaran (2010).

Table 2: Multiple Regression Analysis (N = 200)

	Unstandardized Coefficient		Standardized Coefficient			Collinearity Statistics	
	β	**S.E**	***Beta***	***t***	**Sig**	**Tolerance**	**VIF**
Constant	.280	.199		1.405	.162		
Empathy	.274	.066	.283	4.155	<.001	.395	2.531
Perceived value	.215	.068	.214	3.172	.002	.399	2.503
Reliability	.335	.083	.338	4.054	<.001	.263	3.804
Timeliness	.095	.049	.124	1.935	.054	.448	2.234
R^2				.644			
$_{adj}R^2$				.637			
F				88.153			
Sig. F				<.001			

Multiple regression analysis was done to determine the influence of empathy, perceived value, reliability and timeliness on student's satisfaction with bus service quality. Table 2 summarizes the results of the multiple regression analysis. Overall, the regression model is statistically significant (F = 88.153, p <.05), and the r-squared value explains 64.4% of fitted data in the regression model. The analysis revealed that empathy, perceived value and reliability are significant predictors of student satisfaction. Based on the standardized beta value, reliability has the greatest influence on student satisfaction (β = .338, p <.05), followed by empathy (β = .283, p <.05) and perceived value (β = .214, p <.05). Timeliness was found to not have significant influence towards student's satisfaction (β = .124, p >.05).

Discussion

Focusing on quality aspects has become very important because this will affect customer satisfaction directly or indirectly (Stefano, 2015). The present study aimed to determine the relationship between empathy, perceived value, reliability and timeliness and also to examine the greatest predictors among all four variables towards student satisfaction with the bus service quality at UiTM Cawangan Selangor to provide actionable insights for enhancing service delivery and overall student experience. The outcome of the study denotes that all four variables are significantly correlated with student satisfaction. Empathy and reliability have a strong relationship with student satisfaction, which can make students feel secure and comfortable while using the bus service. In addition, the bus driver's efficiency in ensuring the physical condition of the bus is safe and providing a reliable service can directly increase student satisfaction with the dependability of the service. While perceived value and timeliness have a moderate positive relationship towards student satisfaction.

Overall, the findings support all hypotheses for this study. This is by the famous research by Parasuraman et al. (1988) recommended that "service quality is an important aspect affecting customer satisfaction, consisting of five dimensions: assurance, empathy, reliability, responsiveness and tangibles". Those dimensions are equally vital. The statement has also been supported by Shamsudin et al., (2020) where organizations that offer products or services cannot only focus on one dimension to receive good customer satisfaction.

This study's findings also revealed that empathy, perceived value and reliability are significant predictors of student satisfaction. Unlike the others, the result showed that timeliness was found to not significantly influence student satisfaction. This is in contrast with the latest study (San & Siripipattaworn, 2024). This may be because the students have many times experienced delays with the bus service and the time taken to travel between each stop is quite late and time-consuming. Despite that, reliability appeared to be a key determinant of student satisfaction compared to the other two predictors. As previously described (Parasuraman et al., 1988), "of the five determinants of service quality, reliability commonly appeared as the most important determinant, based on both direct measures of relative importance" (Zeithaml et al., 1990). This is consistent with Abu-Rumman and Qawasmeh (2022), who found that reliability has a strong relationship and affects customer satisfaction. However, in research conducted by Kwortnik and Thompson (2023), empathy has been

proven to be the main component that can meet customer satisfaction based on service experience management. They also said that empathy is a critical determinant in delivering high-quality service experiences that achieve or beyond customer expectations, thereby increasing overall customer satisfaction. In this study, students found that the bus service provided is very reliable including the physical condition of the bus which is good and rarely breaks down, the bus is always there even during bad weather conditions as well as the bus driver has good driving ability. Overall bus service is stable and reliable for the students. Thus, providing dependable service is a key factor in service quality.

5. Conclusion

The findings of this study demonstrate that empathy, perceived value, reliability and timeliness were significantly correlated with student satisfaction. According to the results, three determinants have a real effect on student satisfaction, namely, reliability, empathy and perceived value; however, timeliness does not. Although findings revealed that the students are satisfied with the current services, the fundamental issues such as quality services need to be improved to bear the existing passengers. As a result, will reduce traffic and parking problems on campus and create well-being amongst the university population. Therefore, it is recommended to university administrators and service providers, that any deficiencies related to the quality of bus services should be addressed to assist students in ensuring their smooth movement on campus throughout the academic year. The university administrator also should impose a policy for a green and sustainable campus. Bus service providers also need to ensure that safety and comfort when students use the service are improved based on the latest automotive technology and current market services. Other than that, further research should consider other determinants as independent variables and explore alternative methods, such as interviews or direct observation, to triangulate the study findings for future research. This will help expand the study further and make it possible to generalize the findings.

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The Smart Organization Movement: A Review and Research Agenda for Digital Competencies

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Abstract: In the rapidly evolving landscape of the digital era, organizations are grappling with the imperative to cultivate and harness digital competencies among their workforce to remain competitive. The 12th Malaysia Plan Mid-Term Review (12MP MTR), under one of the 17 Big Bold Measures calls for strengthening sectors and industries with high growth and high value (HGHV). The call to focus on Global Business Services (GBS), identified as one of the strategic industries on the digital competencies of its future work talent is deemed imperative in producing a future agile workforce. The advent of emerging technologies and the increasing interdependence of various industries on digital platforms necessitate a future workforce that embodies agility in adapting to change. This problem statement delves into the pressing issues surrounding digital competencies and the imperative for a future workforce model characterized by agility. Hence, the main objective of this study is to explore a Digital Competency Model for the Malaysian future agile workforce. Academics and practitioners could also refer to this study to enhance their knowledge of digital competencies and workforce agility using a smart organization perspective.

Keywords: *Smart Organization, Workforce Agility, Digital Competency.*

1. Introduction and Background

Digitalization has become a buzzword in the business world and is recognized as something organizations must embrace to stay relevant (Halid, Mui, & Abdul Rahim, 2019). Rapid technological advancement has increased proliferation, resulting in the digitalization of society, and continues to impact and change how organizations work. (Al-Harazneh & Sila, 2021). As a result, in this era of digital disruption, organizations are confronted with the critical challenge of equipping their workforce with the necessary digital competencies to navigate the complexities of the evolving digital ecosystem.

Employees are a critical resource to the organization and act as the stakeholders in the organization's operation. The adoption of Industry 4.0 through smart organization thus has an impact on the employees. As Malaysia is moving towards a digital society in the future, digital competencies are inevitable for both employees and smart organizations. Digital competency, a key factor in workforce agility, is defined as the ability to effectively use digital tools and technologies in the workplace (Oberländer, Beinicke, & Bipp, 2020). Smart organization concepts, on the other hand, are better able than others to cope with technological breakthroughs, social, and cultural problems as well as to compete effectively and develop in an environmentally sustainable way (Adamik & Sikora-Fernandez, 2021).

The significance of digital competency and workforce agility in the context of smart organizations lies in their ability to navigate the rapidly evolving digital landscape and respond effectively to dynamic market conditions. A report by Economist Impact (*Bridging the skills gap: Fuelling careers and the economy in Malaysia*, 2023) revealed that digital skills (65%) are the top focus for employees in Malaysia, with most still prioritizing basic digital skills (83.1%). Advanced digital skills such as artificial intelligence (AI) and machine learning (ML), cloud computing and cybersecurity are also gaining importance. In line with the driving growth in the digital economy, agencies in Malaysia have put tremendous efforts into addressing digital skill gaps among the Malaysian workforce.

The Ministry of Economy's 12th Malaysia Plan Mid-Term Review (12MP MTR) for example highlighted that one of the 17 Big Bold Measures includes strengthening sectors and industries with high growth and high value (HGHV) in line with the Digital Native Agenda 2023 (DNA23) (Kementerian Ekonomi Malaysia, 2023). The emphasis is given to developing the exposure and providing competencies in line with digital transformation

in the global business services industry through smart organization which has been identified as a strategic industry in the 12th Malaysia Plan. The Ministry of Human Resources on the other hand is currently expanding access to high-quality career opportunities in Malaysia through various collaborations with various employers. In other words, enhancing future-ready talent through improving digital competencies to produce a workforce that is resilient and competitive is part of the government's focus for the long term.

However, the traditional models of workforce development are proving inadequate in the face of these dynamic changes (Saputra, 2022). Currently, there are very limited systematic approaches to exploring and mapping digital competencies in the context of an agile workforce, specifically in the context of smart organizations in Malaysia. As a result, organizations often face a dearth of standardized and comprehensive frameworks that define and measure digital competencies. Hence, the absence of universally accepted standards for measuring and developing digital skills hampers the systematic cultivation of a workforce well-versed in the intricacies of the digital realm. It should be noted that by ignoring the establishment of the digital competencies model, the gap between the skills possessed by individuals and those demanded by the digital landscape and agility is widening. This disjuncture not only hinders individual career growth but also impedes organizational progress, as companies find themselves grappling with skill shortages in key areas.

Digital competency is not confined to technical prowess alone. The evolving nature of work requires a synthesis of technical and soft skills. While technical competencies are indispensable, soft skills such as adaptability, collaboration, and problem-solving are equally crucial. Integrating these skill sets harmoniously through the exploration of multidisciplinary digital competencies poses a significant challenge for organizations, as they strive to create a workforce that is not only technically adept but also possesses the interpersonal skills necessary for effective collaboration and problem resolution (Saputra, 2022), in the agile context of smart organizations.

Given the aforementioned research problem regarding the study of digital competencies for the future Malaysian agile workforce, this research explores the digital competency framework through the smart organizations' perspective. The objective of this article is to propose the following propositions:
Proposition 1: The Digital Competency framework is characterized by seven dimensions which comprise (1) solving digital problems (PS); (2) information literacy (IL); (3) self-reflecting on the digital environment (RL); (4) attitude towards digitization (AD); (5) handling digital devices (HD); (6) applying digital security (DS); and(7) collaborating due to digital communication.
Proposition 2: Workforce agility is characterized by ten dimensions namely (1) decision-making; (2) accepting changes; (3) learning; (4) self-organization; (5) testing; (6) iteration; (7) user centricity; (8) reflection; (9) collaboration; and (10) create transparency.

This theoretical paper seeks to answer the following research questions:

- Why are the components of digital competency important as a model of agility for the future workforce?
- How is the digital Competency for agile workforce being explored by smart organizations with the Global Business Sector (GBS)?

2. Literature Review

Digital competency and workforce agility are crucial for the success of smart organizations. Saputra (2022) emphasizes the role of empowering leadership and digital competence in enhancing workforce agility, with the latter serving as a mediator. This is further supported by Toze, Roy, Sharaput and Wilson (2022), who highlight the need for expanded training opportunities to address the challenges posed by smart technologies. The importance of teamwork and digital competence in accelerating workforce agility is underscored by Saputra (2022). Breu (2002) adds to this by identifying the key capabilities of an agile workforce, including competencies and information systems, with a focus on the role of information and communications technology applications in enhancing workforce agility.

The significance of digital competency and workforce agility in the context of smart organizations is paramount in today's rapidly evolving digital landscape. Digital competency refers to the essential knowledge, skills,

abilities, and characteristics required to utilize digital media and technologies effectively and efficiently in the workplace (Murawski & Bick, 2017). This includes the ability to navigate digital tools, communicate effectively through digital channels, collaborate using digital platforms, and adhere to digital security and ethical standards (Oberländer et al., 2020).

On the other hand, workforce agility encompasses the ability of the employees to quickly adapt and respond to changes in the work environment, which is crucial for smart organizations aiming to thrive in a dynamic and competitive market (Adamik & Sikora-Fernandez, 2021; Petermann & Zacher, 2022). Smart organizations leverage digital competency and promote workforce agility as they aspire to remain innovative, competitive, and adaptable in a digitalized environment (Filos & Banahan, 2001). The capability to harness digital technologies effectively allows smart organizations to streamline processes, improve productivity, and enhance their overall performance. Furthermore, having an agile workforce empowers organizations to swiftly respond to market changes, customer demands, and technological advancements, thereby ensuring their sustainability and growth (Quintero, 2022). By fostering digital competency and workforce agility, smart organizations can also create a culture of continuous learning and adaptation, enabling them to stay ahead in the digital age. Ultimately, the synergy between digital competency and workforce agility equips smart organizations to navigate the complexities of the digital landscape, capitalize on emerging opportunities, and drive innovation and growth (Oberländer et al., 2020).

First, digital competency and workforce agility play significant roles in adapting to and thriving in dynamic environments. Digital competency, as a blend of attitudes, knowledge, skills, and talents related to the use of digital technology, is crucial for individuals, groups, and organizations to effectively solve problems, accomplish tasks, and manage information. This is particularly essential in smart organizations where digital technology is integrated into various aspects of operations and decision-making processes (Petermann & Zacher, 2022). Workforce agility, on the other hand, refers to the capability of employees to regulate a dynamic, flexible, and ambiguous working nature through proactive, adaptable, and resilient behaviors. In the context of smart organizations, workforce agility enables employees to respond quickly and effectively to changing circumstances, technological advancements, and market demands. This is especially important in smart organizations as they operate in fast-paced and rapidly evolving environments where the ability to adapt and innovate is crucial for sustainable success (Sameer, 2024). The combination of digital competency and workforce agility empowers smart organizations to leverage digital technologies effectively and enables employees to demonstrate adaptable behaviors that provide options for handling unexpected changes and driving innovation (Mohamad, 2024). This ultimately leads to improved performance, responsiveness to market demands, and sustained competitiveness in the rapidly changing business landscape.

Second, the significance of digital competency and workforce agility in the context of smart organizations lies in their ability to navigate the rapidly evolving digital landscape and respond effectively to dynamic market conditions. Digital competency equips employees with the skills and knowledge to leverage digital technologies, tools, and platforms to enhance productivity, innovate, and adapt to changing business requirements (Fonseca & Picoto, 2020). On the other hand, workforce agility enables employees to be flexible, proactive, and resilient in the face of uncertainty, rapid change, and new opportunities in the digital era. Specifically, in smart organizations, digital competency empowers employees to harness the potential of technologies such as data analytics, artificial intelligence, automation, and cloud computing to drive operational efficiencies, deliver personalized customer experiences, and uncover new business insights (Murawski & Bick, 2017). Meanwhile, workforce agility ensures that employees can quickly adapt to digital transformations, embrace new ways of working, and contribute to organizational innovation and growth in a rapidly changing digital environment. In summary, the synergy between digital competency and workforce agility is essential for smart organizations to thrive in the digital age, enabling them to stay ahead of the curve, seize digital opportunities, and effectively address the challenges posed by digital disruption (Salmen & Festing, 2022).

The purpose of this review is to investigate the influence of digital competence on workforce agility, particularly in the context of smart organization. The key themes and questions addressed include; 1) Understanding workforce agility: The literature review aims to provide a comprehensive understanding of workforce agility as an organizational behavior influenced by both internal and external factors; 2) Antecedents of workforce agility: The review delves into the factors that drive the agility of individuals, groups,

and organizations, exploring both internal factors such as digital competence and external factors like team work; 3) Digital competence: The literature review elaborates on the concept of digital competence and its significance in the contemporary business environment, focusing on its impact on workforce agility; and 4) Research model and methodology: The review also encompasses the description and analysis of the research model and methodology used in the study, including the data collection approach and the statistical analysis techniques employed. These themes and questions collectively aim to provide insights into the interplay between digital competence, teamwork, and workforce agility, ultimately contributing to the understanding of strategies for accelerating workforce agility in the face of dynamic and disruptive changes in the business environment.

3. Theoretical Framework

To establish a deeper understanding of the current research, this study explores the nuances of digital competency. Previous research established that digital competency has emerged as a crucial skill set necessary for success in both personal and professional domains. While there is broad consensus on the fundamental aspects of digital competency—encapsulating skills such as online communication, information literacy, and technical proficiency—recent research begins to unveil subtle differences and new perspectives on what digital competency truly encompasses. By examining these nuances, we can enrich our understanding of digital competency and its role in our increasingly digital world.

The General Consensus on Digital Competency and Workforce Agility

Broadly speaking, digital competency refers to the ability to use digital technology, communication tools, and networks to identify, evaluate, create, and communicate information (Oberländer et al., 2020). Digital competence is defined as a blend of attitudes, knowledge, skills, and talents related to the utilization of digital technology for problem-solving, task accomplishment, communication, information management, knowledge generation, and effective participation in society. It encompasses dimensions such as information processing, communication, content creation, safety, and problem-solving. This competency is influenced by empowering leadership and teamwork, which in turn enhance workforce agility (Saputra, 2022). Digital competence has a positive and significant impact on workforce agility. It enhances the effectiveness of individuals, groups, and organizations in utilizing digital technology for various tasks and activities.

While, workforce agility refers to the ability of individuals, teams, and organizations to adapt, respond, and thrive in a rapidly changing work environment (Sherehiy & Karwowski, 2014). Teamwork also has a positive and significant impact on workforce agility. It is influenced by factors such as digital competence and teamwork. Collaborative efforts and effective teamwork contribute to the adaptability and responsiveness of individuals and organizations in the face of changing work dynamics. (Saputra, 2022). Competency models in the digital era are outdated. There is a need for updated and adaptable competency tools. Workforce agility, crucial for organizational responsiveness, is characterized by intelligence, competencies, collaboration, culture, and information (Breu et al., 2002). The interplay of these factors underscores the importance of digital competency in driving workforce agility consists of 10 dimensions which include decision-making, creating transparency systems, collaboration, reflection, user-centricity, Iteration, testing, self-organization, learning and accepting changes (Petermann & Zacher, 2022).

Theoretical frameworks and models related to digital competency include the concept of digital competence, which encompasses attitudes, knowledge, skills, and talents related to the effective use of digital technology for problem-solving, communication, and information management (Bibi, Al-Ibbini, & Alzoubi, 2023). Workforce agility is influenced by factors such as digital competency and teamwork. Digital competency enhances individuals' and organizations' effectiveness in utilizing digital technology, while teamwork contributes to adaptability and responsiveness (Bibi et al., 2023). Competency models are often used to identify and define the specific competencies needed in different industries and job roles. These models can be developed through methodologies such as deep analysis of literature, expert panel discussions, and mixed methods approaches (Bibi et al., 2023). The development and validation of competency models often involve methods such as surveys, interviews, and data analysis to ensure their reliability and validity. The integration of competencies with human resource co-practices can drive performance improvements in organizations (Samardzic, Ciric Lalic, & Marjanovic, 2022). The concept of workforce agility emphasizes the importance of adaptability,

responsiveness, and the ability to thrive in a rapidly changing work environment (Polo & Kantola, 2020).

Existing debates and variations in definitions of digital competency and workforce agility can be observed in the literature. However, there are no existing debates or variations in definitions related to digital competency, as the concept is generally understood as encompassing attitudes, knowledge, skills, and talents related to the effective use of digital technology for problem-solving, communication, and information management. Digital competency is often defined as the technology-related skills needed to perform in today's business environment. (Polo & Kantola, 2020).

However, there is no unitary definition, and some researchers argue that digital competencies also include abilities, strategies, values, and awareness. (Utomo & Latukismo, 2022). Workforce agility is a concept that emphasizes adaptability, responsiveness, and the ability to thrive in a rapidly changing work environment. There are no specific debates or variations in its definition. This broader definition emphasizes the ability to handle complex situations and utilize psychosocial resources effectively. (Samardzic et al., 2022). On the other hand, workforce agility is a concept that is still not systematically understood. (Jyothirmai, Satish Kumar, & Sowdamini, 2022). While it is recognized as essential for achieving competitiveness, there is no clear consensus on its definition (Sherehiy & Karwowski, 2014). This lack of clarity hinders the development of competency tools that can address the contemporary requirements of digitization. Therefore, there is a need for further research and improvement in defining and understanding both digital competency and workforce agility. Competency models are used to identify and define the specific competencies needed in different industries and job roles. While there may be variations in the specific competencies identified for different roles and industries, there are no significant debates or variations in the overall definition and purpose of competency models. The integration of competencies with human resource practices is generally seen as a way to drive performance improvements in organizations.

Digital Competency

A range of studies have highlighted the critical role of digital competency in enhancing organizational performance. Junior and Macada (2020) identifies four key digital capabilities - sensing, responsiveness, process scanning, and ecosystem connectivity - that drive operational excellence, revenue growth, and customer/stakeholder relationships. Polo and Kantola (2020) underscores the need for updated competency tools to address the digital skills gap, while Oberländer et al. (2020) Offers a comprehensive framework for digital competencies in the workplace. Yu and Moon (2021) further emphasizes the positive impact of digital strategic orientation on organizational performance, mediated by digital competence. These studies collectively underscore the importance of digital competency in driving organizational success in the digital age.

Digital competency plays a crucial role in smart organizations, enabling them to adapt to the challenges of the digital transformation (Bolo-Romero, Gutiérrez-Velasco, Córdova-Berona, & Alvarado-Suyo, 2023). These organizations leverage advanced digital technologies and integrate technical systems with social systems to achieve better performance and competitiveness (Pescatore, 2022). The development of digital competencies is essential for employees in virtual organizations, where work is no longer constrained by traditional concepts of time and space (Cahyarini & Samsara, 2021). Additionally, digital competency is seen as mandatory for civil servants in the public sector, and its implementation faces challenges such as the lack of competency and the need for technology infrastructure improvement (Fonseca & Picoto, 2020). Studies have identified key digital competencies, including data analysis, use, and collaboration through digital technologies, as crucial for companies in the current workplace environment (Saputra & Patrick, 2022). Overall, the literature emphasizes the importance of digital competency in driving organizational success and addressing the demands of the digital era.

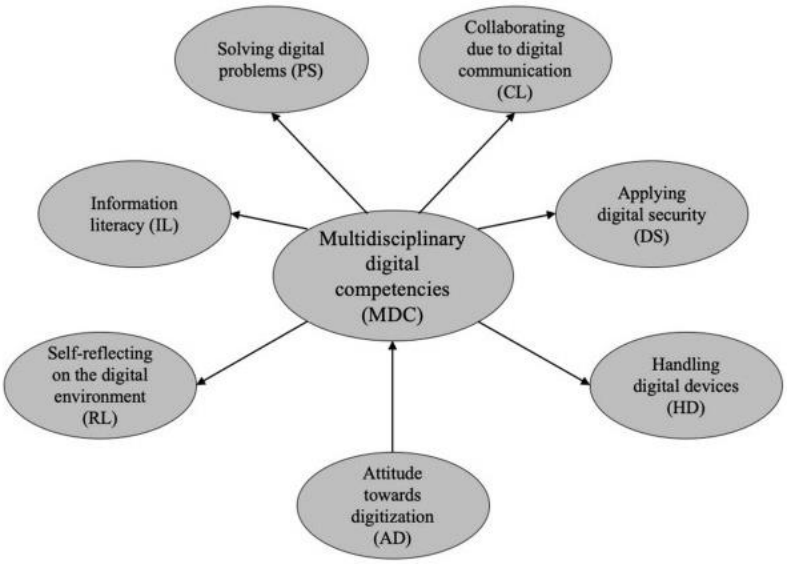
Digital competency is a key factor in workforce performance. The key components of digital competency identified in the abstracts include communication and cooperation in the digital environment, solving technical problems in the digital environment, ensuring digital security, and the ability to use digital and innovative technologies, software, and BI platforms. These competencies are necessary for employees to effectively use digital technologies and internet resources, make decisions in a context of uncertainty, and organize effective work. The development of digital competencies is important for employees to adapt to digital transformation

and compete in the labor market (Madzimure & Baloyi, 2022; Saputra & Patrick, 2022; Vartiainen, 2020).

Digital competency relevant to workforce performance includes several key components. These components include knowledge and skills in digital technologies, such as computational technology, modeling, data analytics, and data sciences (Ilmudeen, 2022). Communication and cooperation in the digital environment are also an important competency, as they enable effective collaboration and teamwork in a digital context (Saputra, 2022). Additionally, the IT capability to solve technical problems in the digital environment is crucial for enhancing firm performance and supporting business processes and knowledge management (Wang, Wang, & Archer, 2018). Ensuring digital security is another important competency, particularly for workers.

Other components of digital competency may include the ability to select and develop information from various digital options, as well as the ability to make decisions in a context of uncertainty and organize effective work. Overall, these competencies are essential for employees to navigate the digital transformation of organizations and contribute to improved organizational performance.

Figure 1: Dimensions of multidisciplinary digital competencies (Roll & Ifenthaler, 2021)



To summarize the different dimensions of digital competencies, Roll and Ifenthaler (2021) highlight seven key areas that add to the understanding of digital skills. Figure 1 shows the dimensions of multidisciplinary digital competencies (MDC). The first dimension is *solving digital problems (PS)* which focuses on the ability to identify, analyze, and resolve issues. Second, *collaborating due to digital communication (CL)* emphasizes teamwork in a smart organization. The third dimension, *applying digital security (DS)* covers the understanding and implementation of practices that protect information and systems from cyber threats. Next, *handling digital devices (HD)* refers to proficiency in using various digital tools and devices, such as computers and smartphones. Then, *attitude toward digitization (AD)* stresses the need for smart organizations to create a positive atmosphere that encourages a positive attitude toward learning and working with digital devices. Subsequently, *information literacy (IL)* implies that the ability to find, evaluate, and use information is essential to navigate digital information landscapes which is the context of smart organizations. Finally, *self-reflecting on the digital environment (RL)* encourages individuals to assess their digital practices and the impact of digital technologies on the organization. These dimensions will represent the direction of this paper and the approach to developing the theoretical framework for digital competencies in smart organizations.

Workforce Agility

The literature on workforce agility underscores its importance in the evolving landscape of smart organizations. Muduli (2017) and Junior (2020) oth highlight the attributes of an agile workforce, including adaptability, flexibility, and competence, and the management actions that can promote these attributes. Qin (2015) further emphasizes the need for workforcbe agility in operations management, particularly in uncertain

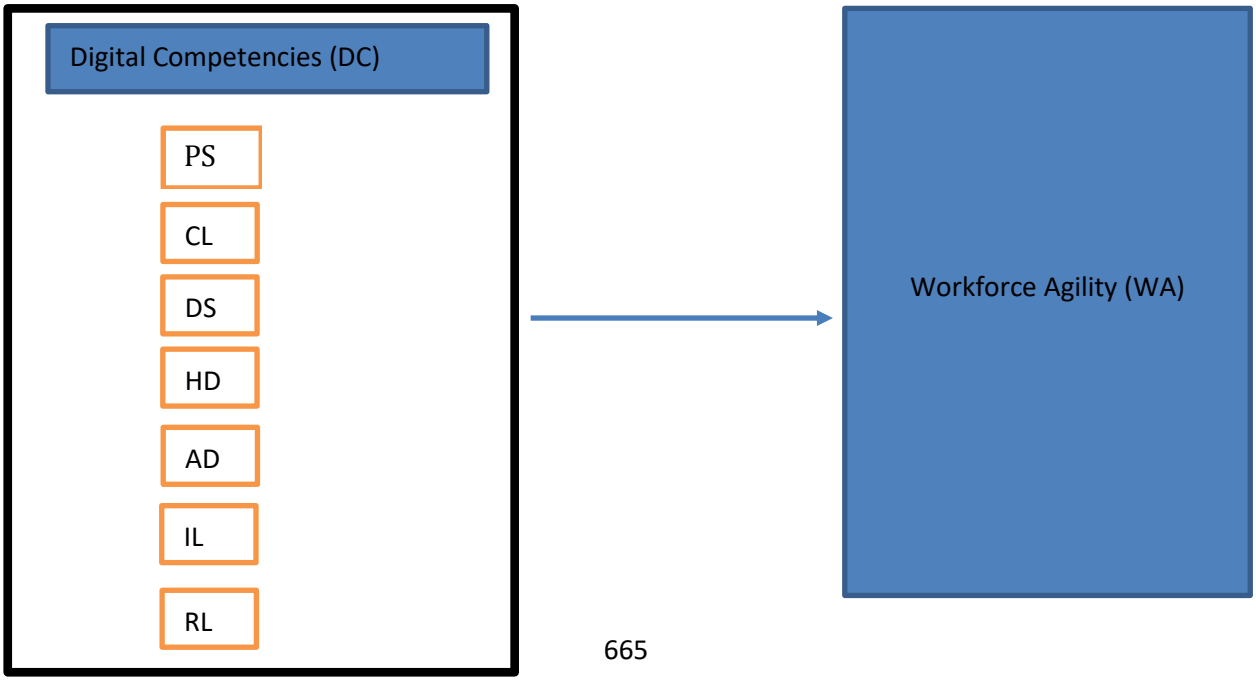
environments, and identifies potential research opportunities in this area. Utomo (2022) provides a comprehensive overview of the trends and patterns in workforce agility literature, offering a roadmap for future research. These studies collectively underscore the relevance of workforce agility in the context of smart organizations, where the ability to respond quickly and effectively to change is crucial.

Workforce agility is a multifaceted concept with various dimensions. Petermann and Zacher (2022) identifies 10 dimensions, including decision-making, transparency, collaboration, reflection, user-centricity, iteration, testing, self-organization, learning, and change acceptance. Junior and Saltorato (2021) further categorizes these dimensions into proactivity, flexibility, adaptability, resilience, and competence, which can be promoted through learning, work organization, human resource management, and organizational culture. Alviani, Hilmiana, Widianto, and Muizu (2024) edlves into the psychological traits that underpin these dimensions, such as job-related curiosity, active listening, ambiguity tolerance, learning from past mistakes, anticipation and planning, job self-efficacy, risk-taking, and trust. Muduli (2013) emphasizes the importance of management actions in promoting these dimensions, including training, compensation, empowerment, teamwork, and information systems. These studies collectively highlight the complexity of workforce agility and the need for a holistic approach to its development and implementation.

The intersection of digital competency and workforce agility presents a rich area for future research. Siddoo (2019) and Oberländer et al. (2020) both highlight the importance of digital competencies in the workplace, with Siddoo identifying key competencies such as lifelong learning and teamwork, and Oberländer proposing a comprehensive framework for these competencies. Breu et al. (2002) and Shern, Abdul Halim, and Thurasamy (2022) further emphasizing the role of digital competencies in enhancing workforce agility, Breu identifies intelligence, competencies, collaboration, culture, and information systems as key capabilities, and Imran discusses the need for diverse competencies in the era of digital transformation. Future research could explore the specific digital competencies that contribute to workforce agility, as well as the most effective ways to develop and enhance these competencies in the workforce.

The increasing prevalence of technology and digital natives in the workplace is reshaping work approaches and competencies (Colbert, Yee, & George, 2016). This shift is driving the need for digital agility, which requires a combination of organizational and IS development agility (Salmela, Baiyere, Tapanainen, & Galliers, 2022). However, the development of digital competencies is facing challenges, including the need for cultural and organizational change, and the demand for expanded training opportunities (Toze et al., 2022). To address these challenges, the integration of digital competence and teamwork is crucial for accelerating workforce agility (Saputra, 2022).

Figure 2: Digital competencies (DC) (Roll & Ifenthaler, 2021) and Workforce Agility (WA) (Petermann & Zacher, 2022) Framework



Conclusively, figure 2 shows the relationship between digital competencies (DC) and workforce agility (WA). This framework lists seven DC dimensions which include 1) Problem solving; 2) Collaboration; 3)Data skills; 4)Handling devices; 5)Digital attitude; 6)Information literacy; and 7) Self-reflection. These seven dimensions are essential to enhancing workforce agility.

4. Managerial Implications and Recommendations

At present, there is very limited literature and theoretical framework on the topic. As the research involves original data collection, analysis, and interpretation, it has the potential to contribute new findings. Thus, this research will contribute to the body of knowledge on a new emerging topic in Malaysia - digital competency framework as the future of workforce agility. Specifically, it proposes a novel framework or theory based on the synthesized literature that contributes to new theoretical perspectives.

This review will contribute to establishing a comprehensive framework that specifically addresses the digital competencies required for an agile workforce. The components identified in the framework could encompass a combination of multi-disciplinary skills that are crucial for adapting to a rapidly changing digital landscape. This research shall provide new insight into smart organizations in Malaysia regarding digital competencies and workforce agility.

Conclusion

The emphasis on continuous learning in the digital era is imperative in the context of society. This may involve studying the effectiveness of various learning and development programs, both formal and informal, in keeping the workforce and society agile and adaptable. Researchers might conduct in-depth case studies on smart organizations in Malaysia to identify best practices, challenges faced, and lessons learned in implementing digital competencies models for workforce agility. These case studies can offer practical insights for other organizations in the region.

Given the importance of digital transformation for economic development in Malaysia, this research shall provide input and guidelines on government policies and initiatives in promoting digital competencies and agility within the workforce from the context of smart organizations. This may include analyses of programs supporting digital upskilling and smart organizations initiatives.

The model derived from this theoretical framework may provide insight into how HR strategies can be adapted to attract, develop, and retain agile talent with the necessary digital competencies. This could involve exploring innovative recruitment practices, performance management systems, and employee engagement strategies aligned with the digital age.

In addition, the output of future research may delve into how organizational culture influences the development of digital competencies and the adoption of agile practices. Understanding the cultural nuances specific to Malaysia can provide valuable insights into effective strategies for fostering agility. The objective of this paper was to establish the profile futures and compare and explore the characteristics of mobile network customers who took part in the five selected mobile network operators in Ghana to understand and identify the differences or similarities between these groups and their experiences. Several differences exist as said earlier.

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Enhancing Employee Retention: The Impact of Training, Career Development and Remuneration Benefits in Selected Manufacturing Companies of Johor Bahru

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Abstract: The lack of employee retention programs is the most persistent difficulty in most organizations today. Employees are a crucial and precious asset for an organization for them to achieve their company goals and objectives. This has raised the demand for staff training programs, career development, and remuneration benefits in most organizations to ensure employee retention. The study aimed to identify the influence of employee training, career development, and remuneration benefits on employee retention in selected manufacturing companies in Johor Bahru, Malaysia. For data collection, a structured questionnaire was administered to 152 employees from seven departments of manufacturing companies in Johor Bahru. All the data was analyzed using SPSS statistics. The finding implies that career development appeared to be the most significant variable among all independent variables. Therefore, organizations should put more focus on the improvement of career development among their employees. Top management should emphasize career development and regularly offer training programs to gain employees' interest in staying in the organizations. Top management should also highlight the importance and benefits of the career development programs and encourage them to join. This in turn enhances retention and increases productivity at selected manufacturing companies in Johor Bahru, Johor.

Keywords: *Employee retention, training, career development, remuneration benefits, manufacturing industries*

1. Introduction and Background

Employees are an organization's most important, valuable, and productive asset since they positively contribute to the achievement of the organization's objectives and mission; however, retaining them is one of the most difficult issues for managers (Singh, 2019). According to Khalid and Nawab (2018), employee retention is the practice of encouraging staff members to remain with the company for as long as possible or until goals are achieved. This procedure also alludes to the duration spent by an employee in an organization. Organizations cannot stop or restrict their employees from seeking more interesting and attractive opportunities; however, the objective of retention strategies is to make employees loyal for the period of their employment with the organization. To increase employee retention, businesses must focus on several areas, such as giving staff members the right training, career development opportunities, and compensation. Hence, these measures make employees feel appreciated, which translates into improved performance and commitment to the organization (Yuniana & Hanafia, 2024).

The goal of employee retention is to maintain people as the company's core specialists (Prasetyo et al., 2021). Fundamental problems in the employment relationship are having an impact on the engagement, motivation, and retention of talented workers, and the talent gap has sparked intense competition (Mohammed Mazlan & Jambulingam, 2023). High staff turnover is a result of poor personnel management, which has a significant detrimental financial impact on firms due to the information lost when employees depart. Ignoring the problem of high turnover rates is very costly because the success or failure of a department or business can be attributed to a single, crucial individual (Mohammed Mazlan & Jambulingam, 2023).

The loss of multiple key employees from a single unit or team may cause instability throughout the entire organization. Despite the importance of employee retention, there remains a gap in research, particularly in comparison to customer retention studies, highlighting the need for more extensive investigations into employee retention and the value employees bring to organizations. Numerous studies are focusing on customer retention and the level of retention that is beneficial to the organization. This becomes a critical business issue and an expensive application, especially if valuable employees leave. Furthermore, the costs of hiring a new employee are expensive and often take time. This study aims to determine how to retain people in manufacturing companies by focusing on factors like employee training, career development, and

compensation benefits. It would also be useful to know the reasons why employees leave an organization.

2. Literature Review

Employee retention

Companies are now starting to recognize the importance of key employees and the relevance of employee retention. They also strive to develop various employee retention strategies to prevent employees from leaving the company. Employee retention is described as a method that companies use to maintain an effective employee while striving to meet organizational objectives. (Kossivi et al., 2016), strategies to valuable employees (Abba, 2018) and the ability to keep the employees you desire for a longer period than your competitors (Khan, 2020). According to Das (2013), the process of encouraging staff members to stay with the company longer or until the project is finished is known as employee retention. Helping to keep employees from leaving is the most important component of employee retention since they can negatively affect an organization's productivity and income (Samuel and Chipunza, 2009). Low employee retention may cause problems such as a lack of qualified labor, which inhibits the organization's ability to innovate and be productive (Kwan & Mansor, 2023).

Companies should develop their strategies based on various elements. However, if the companies only focus on a few factors, they will gradually lose their best as they fall behind in the competition. Generally, according to Abdulai et al., (2019), when employees quit an organization, they will bring a lot of details to rival companies such as trade secrets, organizational culture, and other knowledgeable vital information learned from their prior employer, results in a difficult situation for the former employers. This is the reason why management needs to design retention strategies to help them retain valued employees to work for a longer period (Abdulai et al., 2019).

Employee training

Training refers to a process of shaping and educating employees by increasing their skills, abilities, knowledge, and behavior so that work can be performed quickly, rationally, and effectively (Niati et al., 2021). Employees will gain specific knowledge and be able to develop skills that can later be applied at work if they are given training (Adnyani and Dewi, 2019). According to Jumawan et al. (2024), there are numerous dimensions and indicators in training. The indicators of training include instructors, participants, resources, and training objectives. Triasmoko (2014) argue that training is a process that teaches specifically an employee's skills, discipline, attitudes, and skills related to the work that the employee will perform.

According to Halim and Ha (2010), views of HR practices such as job security and training offered by the organization are crucial factors in explaining employee retention. Additionally, some studies claim that HR policies like perks and training are related to retention in a good way since they encourage workers and "lock" them into their work positions, a concept known as employee retention (Yuniana & Hanafia, 2024; Hong et al., 2012). Some of the factors affecting employee retention, like the perception of support from the manager, the agency, and the community, can be addressed through training (Landsman, 2004). Landsman (2004) also stated that training is also considered a helpful activity for improving staff performance and skills, employee duties can be more clearly defined through training, reducing job stress. As a result, companies that offer more training opportunities should see higher retention rates. However, not all factors that impact staff retention can be addressed by training, such as internal promotion opportunities. Therefore, it makes sense to say that training may help with employee retention, but other systemic barriers must be addressed together, if not retention may not still be improved.

Job-related training plays a crucial role in enhancing employees' problem-solving abilities, confidence, motivation, and commitment, which ultimately increases employee satisfaction and retention (Hong et al., 2012). Mehta et al. (2014) state that it is better to keep a trained worker on staff rather than squander money on new hires and retrain them. According to Wassem et al. (2019), losing an organization's most important people has an impact not just on its economic growth but also on its organizational growth. The ability of a business to effectively manage and leverage its most valuable resource which is human resources determines a lot of things about its performance over the long run. Recognizing employee retention as a pivotal element in organizational achievement, companies must address various contributing factors, including benefits

packages, career advancement opportunities, supervisor support, and working conditions, to secure long-term success.

H1: Employee Training has a significant relationship with Employee Retention in manufacturing companies in Johor Bahru, Johor.

Career Development

The process of increasing a person's employability to land the desired employment is known as career development. Work experience that is sufficient for employees will bring job satisfaction to all employees, which improves their performance (Adnyani and Dewi, 2019). For an employee to advance and accomplish his or her goals in any organization, career development is crucial, yet, it relies on how the business offers opportunities in terms of creating new ones, delegating difficult work, offering rewards and recognition at many phases (Challa et.al, 2024). A study by Carda, (2024) also proved that career development is a crucial element in manufacturing organizations in Indonesia since it will improve the performance of the employees in the organization. Therefore, every employee should be allowed to develop their skills and careers, and they are expected to deliver the best outcomes for the organization (Yuniana & Hanafia, 2024). For the business and the individuals involved to reach their maximum potential, career development is a job activity that helps employees plan their future careers inside the organization (Jumawan et al., 2018). Employers can use career development to support and boost worker productivity as well as to help employees get ready for their future careers (Putri and Frianto, 2019). Career development is one of the most important factors in reducing employee turnover intention. As been found in the study by Azami et. al, (2023), providing excellent career development opportunities encourages employees to stay with the company longer. Creating a healthy social work environment and providing content for the jobs and tasks that employees have to do increases employee satisfaction and commitment (Deery and Jago, 2015).

H2: Career development has a significant relationship with Employee Retention in manufacturing companies in Johor Bahru, Johor.

Remuneration Benefits

Remuneration has a significant impact on attracting and retaining talented employees. Individual performance is generally linked to rewards to ensure increasing productivity levels and to keep talented individuals in the organization (Magaisa and Musundire, 2021). Offering a competitive compensation plan is commonly discussed for retention reasons since remuneration allows employees to meet their financial and material needs while also gaining social recognition (Tadesse, 2018). Money is not the main determinant in employee retention, according to Uwimpuhwe et al. (2018) Many firms deploy very effective pay-based or high-remuneration retention strategies. In these conditions, a variety of elements seem to contribute to good employee retention. Other retention variables are real and cannot be disregarded. Kinyili (2018) evaluated remuneration and benefits as the most crucial factors in employee retention, which is corroborated by the results of previous studies. Performance remuneration is a key component in the goal of the organization to keep its valuable employees. (Yousuf and Siddqui, 2018). Rewarding is said to be the most important factor in attracting and retaining talent (Terera and Ngirande, 2014). The fundamental principle of the implied and contractual relationship between employers and employees is that reasonable remuneration can influence conduct (Mbugua et al., 2014). To attract and keep excellent employees in the market, organizations frequently offer competitive remuneration packages, such as stock options, special pay, retention pay, gain share pay, performance base pay and bonuses, etc.

H3: Remuneration benefits have a significant relationship with Employee Retention in manufacturing companies in Johor Bahru, Johor.

3. Research Methodology

Research design is a master plan that consists of the methods and procedures that will be used in the data collection and data analysis to extract the information needed. According to Bostley (2019), to choose the research methodologies and procedures to use, the researcher needs to have a solid understanding of the research and how to suit it into the whole research process.

This study follows a quantitative approach by utilizing correlational research design studies to examine the relationship between variables. The unit of analysis for this study is individual, which involves employees from

manufacturing industries in Johor Bahru, Malaysia. The population of this study is 250 employees from certain departments in manufacturing companies located in Johor Bahru, Johor. Departments that are involved in this study are finance, purchasing, human resources, marketing, project, information technology and sales department.

The sampling technique that has been used for this study is non-probability via convenience sampling. This sampling technique is the most easily accessible to the researcher. Convenience sampling is typically low-cost and straightforward, with participants readily available. This sampling is frequently used to overcome several of the limitations of research. (Hamed, 2016). Employees from various departments of selected manufacturing companies have been chosen as samples for the sampling technique. According to Krejcie and Morgan (1970), the minimum sample with a population of 250 should consist of 152 respondents. The survey study has been carried out using a questionnaire. The questionnaire is considered an effective data collection method as it can be best administered personally to the sample that was chosen for the study (Bougie & Sekaran, 2019).

Table 1: Reliability Analysis.

Factors	Cronbach's Alpha	No of item	Result
Employee Retention	0.973	12	Excellent
Employee Training	0.959	7	Excellent
Career Development	0.964	7	Excellent
Remuneration Benefits	0.971	7	Excellent

The reliability analysis has been done for the instrument used in this study. The result shown in Table 1 indicates the value of Cronbach's alpha for employee retention is 0.973, employee training is 0.959, career development is 0.964 and remuneration benefits is 0.971. Overall, Cronbach's Alpha for each variable is in the range of 0.8 to 1.0 and can be considered excellent. The result showed the ability of the items in the research instrument to measure the variables is satisfactory and the respondents agreed with the entire item under this variable. The variable is considered strongly influenced. All the data in this study were analyzed by using SPSS version 25.

4. Results

Descriptive Analysis

The basic statistical description of variables, such as mean, standard deviation, minimum, and maximum, from the questionnaire responses provided by the respondents is examined using descriptive analysis. Conducting this analysis is crucial to examine the differing opinions and concepts held by the respondents. The average absolute value of the researcher's mean is 2.5 because they employed a five-scale point Likert scale.

Table 2: Descriptive Analysis

	Mean	Std. Deviation
Employee Retention (DV)	3.7579	.86296
Employee Training	3.7901	.86272
Career Development	3.7745	.88189
Remuneration Benefits	3.6453	.95997

From Table 2, it depicts that all variables are above the average absolute value of 2.5. The mean of the dependent variable which is employee retention is 3.7579 which indicates that all the respondents agree that all the attributes in this study are very important in influencing the employee retention intentions towards manufacturing companies in Johor Bahru, Johor. Based on the means score as shown in Table 2, employee training received the highest average score (3.7901), indicating that employees, on average, perceive the training programs positively. Besides that, remuneration benefits received the lowest average score (3.6453), suggesting that employees, on average, might be less satisfied with their compensation and benefits.

Correlation Coefficient Analysis

As the objectives of this study are to investigate the relationship between variables, Correlation coefficient

analysis has been conducted. The findings of this analysis can be shown in Table 3 below.

Table 3: Correlation Coefficient Analysis

		ER	ET	CD	RB
ER	Pearson Correlation	1	.935**	.945**	.894**
	Sig. (2-tailed)		.000	.000	.000
	N	147	147	147	147
ET	Pearson Correlation	.935**	1	.937**	.860**
	Sig. (2-tailed)	.000		.000	.000
	N	147	147	147	147
CD	Pearson Correlation	.945**	.937**	1	.976**
	Sig. (2-tailed)	.000	.000		.000
	N	147	147	147	147
RB	Pearson Correlation	.894**	.860**	.876**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	147	147	147	147

The result in Table 3 showed that employee training (ET) has a significant relationship with employee retention (ER) ($r = 0.935$, $p < 0.000$). Employee training is also positively associated with employee retention. Thus, Hypothesis 1 (H1), stating that employee training has a significant relationship to employee retention at selected manufacturing companies in Johor Bahru, Johor is accepted. Also, the respondents agreed that they have learned many job skills in their position. The researchers found that employees are more likely to stay engaged and committed to a company that invests in their professional growth. Adequate training opportunities can boost employee morale, and job satisfaction, and ultimately increase employee retention.

The result showed that career development (CD) has a significant and strong relationship with employee retention (ER) ($r = 0.945$, $p < 0.000$). Career development is also positively associated with employee retention. Thus, Hypothesis 2 (H2), stating that career development has a significant relationship to employee retention at manufacturing companies in Johor Bahru, Johor is accepted. Also, the respondents agreed that their job offers growth and opportunities.

The result showed that remuneration benefits (RB) have a significant relationship with employee retention (ER) ($r = 0.894$, $p < 0.000$). The remuneration benefits are also positively associated with employee retention. Therefore, Hypothesis 3 (H3), stating that remuneration benefits have a significant relationship to employee retention at manufacturing companies in Johor Bahru, Johor is accepted. Here, it was noticed that the respondents felt happy with their pay compared to the amount of work they do. Adequate remuneration motivates employees to perform at their best.

Multiple Regression Analysis

Table 4: Model Summary for Correlation Coefficient

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin Watson
	.962[a]	.925	.923	.23918	1.780

a. Predictors: (Constant), Remuneration Benefits, Employee Training, Career Development
b. Dependent Variable: Employee Retention

Table 4 represents the regression coefficient R2 value of 0.925 and calculates the amount of the dependent variable's fluctuation that the independent variables can explain. It shows that 92.5 percent of the variance for employee retention is described well by all three (3) independent variables, namely employee training, career development and remuneration benefits. Consequently, the balance of 7.5 percent was determined by other factors that have not been tested in this research.

Meanwhile, the R-value of 0.962 explains the relationship between independent variables (employee training,

career development and remuneration benefits) and dependent variable (employee retention). There is a substantial correlation between the independent and dependent variables, as indicated by the R-value of more than 0.8. The percentage of variation that can be explained by simply the three (3) independent variables that aid in explaining the dependent variable (by accounting for the degree of freedom, df) is indicated by the adjusted R2 value of 0.923. The outcome demonstrates the strong link between all three (3) independent variables with employee retention. Durbin-Watson shows a score of 1.780, this indicates that this study is free from error because the score is more than 1.50.

Table 5: Coefficient Analysis.

Model	Standardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
(Constant)	.148	.090		1.648	.102
Employee Training	.334	.067	.334	4.956	.000
Career Development	.421	.070	.431	6.047	.000
Remuneration Benefits	.207	.044	.230	4.705	.000

a. Dependent Variable: Employee Retention

Table 5 shows the career development regression coefficient (β) = 0.431 or 43.1% which implies that a one percent increase in career development, an average 43.1% increase in employee retention in the Company. The T-test value is 6.047 and significant at .000 level which is less than .005. It suggests that the relationship between career development and employee retention in the company is positive and significant. The relationship is significant, and the regression model is valid.

The employee training regression coefficient (β) = 0.334 or 33.4% which implies a one percent increase in employee training, and a 33.4% increase in employee retention in the Company. The T-test value is 4.956 and significant at .000 level which is less than .005. It demonstrates the strong and favorable correlation between employee retention in the business and training. Both the regression model and the relationship are valid.

As a conclusion, the most significant factors that influence employee retention in manufacturing companies in Johor Bahru, Johor is recognized with the highest score of 0.431.

Hypothesis Testing

All three (3) of the hypotheses were found to be supported by the analysis results of the study participants. The outcomes in Table 6 serve as a guide for interpreting the direct impact study hypothesis results. First off, the results of the early correlation tests for hypothesis 1 showed that employee training and retention had a positive association ($\beta = 0.334$, $p < 0.000$), supporting the hypothesis. The second hypothesis suggests a connection between career development and employee retention. Additionally, the study revealed that there was support for this association ($\beta = 0.421$, $p < 0.000$). Finally, hypothesis 3 proposes a connection between remuneration benefits and employee retention. The analysis showed that Hypothesis 3 was supported with values of $\beta = 0.207$, $p < 0.000$.

The findings derived from the hypothesis testing indicate that employee training, career development and remuneration benefits are significant determinants in employee retention. The findings of this study can be utilized to enhance employee retention by the implementation of strategies aimed at enhancing employee training, refining career development, and determining the remuneration benefits to the employees.

As depicted in Table 6, all hypotheses were accepted as each p-value of the hypothesis is less than 0.05 ($p<0.05$). Hence, the conclusion is employee training, career development and remuneration benefits have a significant relationship to employee retention in manufacturing companies in Johor Bahru, Johor.

Table 6: Summary of Hypothesis Testing

Hypothesis	Hypothesis Statement	Result (p<0.05)	Sig. (p-value)	β
H1	Employee Training has a significant relationship to Employee Retention in manufacturing companies in Johor Bahru, Johor.	Accepted	0.000	0.334
H2	Career Development has a significant relationship to Employee Retention in manufacturing companies in Johor Bahru, Johor.	Accepted	0.000	0.421
H3	Remuneration Benefits have a significant relationship to Employee Retention in manufacturing companies in Johor Bahru, Johor.	Accepted	0.000	0.207

Discussion

Research Objective 1:
To examine the relationship between Employee Training and Employee Retention in the manufacturing companies in Johor Bahru, Johor.

The result showed that employee training has a significant relationship with employee retention (r = 0.935, p <0.000). Employee training is also positively associated with employee retention. Thus, Hypothesis 1 (H1), stating that employee training has a significant relationship to employee retention at selected manufacturing companies in Johor Bahru, Johor is accepted. Also, the respondents agreed that they have learned many job skills in their position. The researchers found that employees are more likely to stay engaged and committed to a company that invests in their professional growth. Adequate training opportunities can boost employee morale, and job satisfaction, and ultimately increase employee retention. According to Elsafty & Oraby (2022), training is one way to increase employee retention. Personalized, well-structured training programs should be introduced within any company based on the needs and demands of each employee. This finding is also supported by a study conducted by Akther & Tariq (2020), where the study results indicate employee training correlates adequately with employee retention. Apart from that, manufacturing processes often involve specialized equipment and techniques. Training helps employees acquire the necessary skills to operate machinery, use tools effectively, and perform their tasks efficiently. Well-trained employees are more competent, leading to higher productivity and fewer errors.

Research Objective 2:
To examine the relationship between Career Development and Employee Retention in the manufacturing companies in Johor Bahru, Johor.

The result showed that career development has a significant and strong relationship with employee retention (r = 0.945, p <0.000). Career development is also positively associated with employee retention. Thus, Hypothesis 2 (H2), stating that career development has a significant relationship to employee retention at manufacturing companies in Johor Bahru, Johor is accepted. Also, the respondents agreed that their job offers growth and opportunities. The researchers found that career development is the dominant factor influencing employee retention in manufacturing companies in Johor Bahru, Johor. Career development includes opportunities for promotions and advancement within the organization. Employees feel valued and recognized when they see a clear path for growth within their current company. This, in turn, encourages them to remain committed to the organization. A study by Sari & Dewi (2020) stated that employee retention will rise if employees' career growth opportunities are expanded. Companies that provide adequate career development to employees will be loyal to the company for a long time and may increase employee retention. A study conducted by Kandasamy et al. (2019), also recommended that there is a positive and significant impact on career development and employee retention. Furthermore, employees who receive career development opportunities are more engaged, productive, and committed to the success of the company. As a result, the organization benefits from improved performance and a more skilled and capable workforce.

Research Objective 3:
To examine the relationship between Remuneration Benefits and Employee Retention in the manufacturing companies in Johor Bahru, Johor.

The result showed that remuneration benefits have a significant relationship with employee retention ($r = 0.894$, $p < 0.000$). The remuneration benefits are also positively associated with employee retention. Therefore, Hypothesis 3 (H3), stating that remuneration benefits have a significant relationship to employee retention at manufacturing companies in Johor Bahru, Johor is accepted. Here, it was noticed that the respondents felt happy with their pay compared to the amount of work they do. Adequate remuneration motivates employees to perform at their best. Feeling valued and rewarded for their efforts increases job satisfaction, leading to higher levels of engagement and commitment to the company. The findings are consistent with previous studies conducted by Ping et al. (2022), the results show a significant positive relationship between remuneration benefits and employee retention. According to the study by Sorn et al. (2023), the most critical variable influencing employee retention is remuneration. Employees who are dissatisfied with their pay are more likely to quit their jobs. Offering competitive salaries and benefits ensures that employees are fairly compensated for their skills and contributions. When employees feel they are being paid well, they are more likely to stay with the company.

5. Managerial Implications and Recommendations

First, an organization needs to establish a clear career path. Develop a well-defined career progression plan for employees in various roles within the organization. Outline the skills, experience, and milestones required for advancement, providing employees with a roadmap for their professional growth. By clearly defining the career path with specific requirements and expectations for each level, employees can have a transparent understanding of the skills, experience, and qualifications needed for career advancement within the company. Regular feedback, training, and opportunities for skill development should be integrated into the career development plan to support employees on their journey toward higher-level roles.

Second, offer training and development programs. Invest in training and development initiatives that cater to the specific needs of employees. Provide both technical and soft skills training to enhance their capabilities and prepare them for higher-level roles. By offering a comprehensive range of training and development programs, manufacturing companies can empower employees to advance in their careers, develop new skills, and stay engaged and committed to the organization. These programs not only improve the overall skill set of the workforce but also demonstrate the company's commitment to employee growth and professional development, reducing turnover and boosting retention.

Next, encourage mentorship and coaching. Implement mentorship programs that pair experienced employees with junior staff. This fosters knowledge sharing, skill development, and a sense of camaraderie among employees. By implementing a robust mentorship and coaching program, manufacturing companies can provide employees with personalized support, guidance, and opportunities for career growth. This creates a positive work environment, enhances employee engagement, and fosters a sense of loyalty, contributing to higher retention rates and a skilled and motivated workforce.

Another recommendation of this study is to engage in succession planning. Develop a succession plan that identifies potential internal candidates for key roles within the company. This not only ensures continuity but also demonstrates that employees have growth opportunities within the organization. By engaging in proactive succession planning, manufacturing companies can demonstrate their commitment to employees' career development and growth. This approach fosters a sense of loyalty and engagement among employees, as they see clear opportunities for advancement within the organization. Retaining employees through succession planning not only ensures the continuity of critical roles but also contributes to a skilled and motivated workforce that is invested in the company's long-term success.

Finally, monitor employee progress. Keep track of employees' career development progress and celebrate milestones achieved. Regularly revisit and update their career development plans based on performance and changing goals. By closely monitoring employee progress, manufacturing companies can demonstrate their

commitment to employee growth and development. Regular feedback and support contribute to employee engagement and satisfaction, increasing the likelihood of retaining skilled and motivated employees who see a clear path to advancement within the organization. Employers can increase employee retention in many other ways. Increasing employee retention is based on the overall workplace experience that you provide for staff members. All the recommendations about increasing employee retention are common sense, basic and incredibly least to find in organizations today.

Conclusion

Based on the findings presented it is well proven from the previous study and supported by the statistical analysis results that three (3) factors influence employee retention in manufacturing companies in Johor Bahru, Johor. Among all antecedents, the most influencing factor on employee retention at manufacturing companies in Johor Bahru, Johor was found to be career development. Therefore, it is suggested that top management should emphasize more on ways to enhance the career development of their employees. The researchers also made several suggestions to further and maintain career development levels in the company.

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Hypothesis Test of Human Capital Investment Determinants on Institution's Performance Using PLS-SEM Approach

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Abstract: Accelerating the quality of education institutions remains a priority for the Malaysian Government as it forms the foundation for building a high caliber talent in the labor market. Focusing on improving the quality of universities one of the main concerns is to develop the human quality through increasing the quality and resilience of human capital as the enabler towards competitive global market. In general, this paper recognizes the findings on the role of human capital investment determinants and their significant contribution to the institution's performance. It also highlights the importance of HCI in ensuring institutional success and sustainability within a highly competitive business landscape, as outlined in the Twelfth Malaysia Plan (2021-2025) and Malaysia Education Blueprint 2015-2025. Human capital plays a strategic role in enhancing academic quality, which in turn influences issues like labor market inefficiencies and the overall improvement of Malaysia's education system. Hence, to analyze the contribution of determinants a theoretical model was constructed underlined by the Human Capital Theory, Resource Based View (RBV) and Malcom Baldrige criteria. Then to obtain the feedback a survey consisting of sixty (66) items with a seven (7) Likert scale was used as the measurement instrument to gather the data from 309 lecturers in UiTM. Data then were analyzed using the Structural Equation Modelling (SEM) approach on the SmartPLS3 platform. The result indicates that the coefficient of determination (R^2) value of 66.9% value suggests that the variation in institutional performance can be moderately explained by HC determinants, with knowledge, skill and training positively influencing institutional performance.

Keywords: *Human Capital Investment, Malcolm Baldrige, High Education, PLS-SEM & Performance*

1. Introduction and Background

One of the factors influencing the nation's development indication, strengthening lifelong learning (LLL) and sustaining the quality of the labor market to meet industry demand requires a strong effort to reach the institution's standard of performance. The Twelfth Malaysia Plan (2021-2025), demonstrated a comprehensive commitment to developing human capital quality under the 29 actions of the Service Sector Blueprint, 2015-2020 (SBB). As part of that, the Blueprint has outlined that Priority Area D consists of seven strategies (Strategy D1-Strategy D7). This component of priority describes the government's national agenda concerning Bumiputera's socioeconomic development providing a priority through governance, service delivery and human capital development. The strategy includes:
Strategy D1- Accelerating Bumiputera Socioeconomic Development
Strategy D2- Improving Governance and Strengthening Service Delivery
Strategy D3 – Strengthening Education and Empowering Human Capital
Strategy D4- Increasing the Resilience and Sustaining of Bumiputera Business
Strategy D5-Increasing Bumiputera Wealth Creation
Strategy D6-Optimizing Malay Reserve Land and Waqf Instruments
Strategy D7-Ensuring Sustainable Corporate Equity Ownership

Therefore, as one of the education institutions that aim to optimize its quality in delivering high-quality service, UiTM progressively provides the opportunity to improve the quality of lecturers by encouraging involvement in the human capital development program. On the other hand, these days society also expects universities to perform better in their basic roles of outreach, research teaching and learning (Diaz et al. (2022). Therefore,

focusing on this demand, one of the institution's strategies is to increase the efficiency of their lecturers through the human capital development program. On the other hand, the education institution must strategize its efforts to assist the government in achieving the Priority Area D strategies.

This process requires a fair amount of work up front and a lot of organization member involvement but is well worth the effort. Implementatively, a streamlined process to ensure work activities are aligned to the right place in strengthening education and empowering human capital is being provided as an alternative. Education instructors with higher levels of potential are more skilled and productive in terms of contributing to economic growth and development. Whereas, investing in human capital is also crucial because it positively associates the student's success and excellence in an education setting. To put it another way, our higher education system needs competent talent who consistently develop their capabilities related to their knowledge, skills, and intellect to produce better job quality. The process is carried out because all employees need knowledge related to increasing their skills, experience, and abilities to improve their careers as well as the institution's performance.

2. Literature Review

Human Capital

One metric used to assess the long-term sustainability of institutional achievement is human capital. Human capital is one of the important inputs relating to the performance, competitiveness, and sustainability of organizations. It is necessary to focus on the effectiveness of the utilization of these inputs and to take the appropriate measures. Generally, the Human capital theory (HCT) discusses the role of education and training as investments in individuals (Becker, 1964). Next according to Schultz (1961), human capital refers to the knowledge and skills that individuals acquire through formal education and training. This type of capital arises from deliberate investments that yield returns. Moreover, he also considers the investment in human capital as the criteria for educational enhancement for self-development. While Islam & Amin (2021) stated, the terminology of human capital relates to the individual capability to bring their knowledge, skill.

Recently, human capital has been recognized as a key factor to maintain a company's position, by improving its performance in both financial and non-financial aspects. abilities, and other characteristics (KSAOs) to the institution, but such contributions are intertwined with their health and well-being. In debt, because an organization cannot own its human capital in its entirety, its essential competencies must be protected. The well-being lens should be used to see human capital to gain a deeper understanding of how to manage it. All of this emphasizes how important it is to embrace broader viewpoints on human resources that connect well-being to human capital. Equally important, Zane & DeCarolis (2024) contend that an organization's future success can be influenced by early choices on human capital, including what resources and knowledge to acquire.

Malcolm Baldrige Criteria for Performance Excellence

Maintaining the high institution's quality is not a simple effort but it is a dynamic and challenging process. The education atmosphere always changing times. Because of this phenomenon education institution performance is the result of the work in quality and quantity of education staff in their career. Better service to the students resulted from a highly competent of academic staff (Budiarti, 2020). by identifying the potential areas of improvement. The Baldridge has been recognized globally for more than 32 years as the cutting edge of validated performance practice, and it is utilized by a wide range of originations, including government agencies, non-profits, healthcare organizations, manufacturers, service providers, small businesses, schools, colleges and universities.

The Malcolm Baldrige Criteria for Performance Excellence assist in assessing the institution's strengths and opportunities. This framework appears to help the institution to understand how well you are achieving its standard of performance. This framework underlying seven categories of areas include leadership, strategic planning, customers and market focus, measurement, analysis and knowledge management, human resource focus, process management and results (Foster et al. (2007). Similarly, Kanter & Page (2020) emphasize that Baldridge was proven able to provide the organization with better financial results, satisfied loyal customers, improved products and service and an engaged workforce. On the other hand, Baldridge also helps to align the

organization with existing resources, improve better communication, increase effectiveness, and achieve strategic goals.

Training

The human capital of an organization is one of its most important assets and it has a big impact on how well the organization performs (Wright, 2021). Therefore the organization needs to examine how this resource can play as a strong predictor of its agility, long-term sustainability and competitiveness. In a broader sense, Islam & Amin (2021) highlight, that human capital's emergence extends beyond formal training and encapsulates social boundaries, work processes and culture. This includes the organization's formal training, learning environment, and work practices, together with individual self-endeavors, which contribute to shaping the workforce's core competence in performing the task efficiently and effectively. Investing in developing human capital helps to develop employees, and its deployment improves organizational performance. Thus, when the organization provides training, educational development and work experience the individuals hold this as a personal asset and can choose to deploy it to best effect for their own career growth (Shortland & Porter, (2020). Therefore, the contribution that job-related training can make to individuals' knowledge and expertise can be disseminated throughout their employing firms. Consequently, Becker (2009) through Human Capital Theory postulates that expenditure on education and training is an investment in human capital with positive economic outcomes, raising company productivity and individuals' income levels.

Education

As a pioneer of Human Capital Theory Schultz (1973) discussed that in developing an individual investment should be directed to the highest education level, training in the workplace, migration between sectors, health, and economic information. Next Bontis (1999) lists genetic inheritance, education, expertise, and attitudes as factors that constitute human capital. Additionally, Ragoobur & Narsoo (2022) investment in education brings a significant result to a long-run rise in the stock of human capital which raises income and provides a greater return in terms of increased productivity, better employment opportunities, higher income, and economic growth. Next Spence (1973) demonstrated a classic view of the human capital concept saying a candidate can signal high levels of competence with a degree from a quality university. From this signal, the employer can deduce the candidate's abilities. A degree from a reputable university serves as an effective signal because it is perceived as challenging to acquire for someone without the necessary competence It has been shown that a good university degree is a powerful signal because it is seen as being hard for someone who lacks competence to earn one.

Knowledge

Accumulating a robust set-in intangible asset provides the organization with opportunities for enhancing business performance as well as maintaining its long-term sustainability. Zane & DeCarolis (2024) conceptualized human capital which encompassed employee's knowledge, skill, and experience. They believed the acquisition of knowledgeable employees is critical to the successful development and commercialization of products and services. According to Ngoc (2020) nowadays, managing knowledge is one of the crucial parts of facing a competitive environment. Generally, sustainable knowledge creation starts with informal interaction, then it turns to formalize it into a systematic format. In other words, knowledge begins with the accumulation of experience, fact, intelligence, value, information, and intelligent understanding that could help evaluate and gain new experience and information. Organizations that rely on this capability will be able to assist the employees in building their learning abilities and solve various problems regarding the organization's commitment. Many studies have shown that the knowledge and experience associated with human capital are crucial for organizations to adapt to environmental changes.

Knowledge areas are recognized as key indicators and an essential aspect in identifying and leveraging business opportunities (Kidwell et al, 2020). Lastly, Islam & Amin (2021) emphasized defining the concept of human labor with the boundary of individual physical strength, with little consideration for the individual's knowledge and competence. It pertains to the level of understanding of relevant theoretical and procedural knowledge as it relates to work processes. Functional competence addresses how and when to apply this knowledge, reflecting the degree to which an individual develops crucial work skills through practice and learning. This concept demonstrated the crucial role of knowledge in the organization's quality and agility. More precisely, knowledge denotes the comprehension and theoretical knowledge required to do a task;

Functional competence, or the degree of task-specific expertise, is referred to as skills; ability, or an enduring capability, applies to a variety of tasks relevant to the job; and other characteristics are personal qualities related to the performance of the job (Islam & Amin, 2021).

Skill

As discussed by Harris, Brown & Spence (2024), organizations must balance the benefits and drawbacks of each human capital strategy and thus, it is important to recognize the factors that influence an institution's choice of human strategy internally and externally. Focusing on the roles of human capital which provide a significant value in terms of acquisition of knowledge, skills, and abilities typically the organization needs to understand the uniqueness of the process. Conventionally in a working environment, people need the opportunities to learn and practice new skills as a strategy to invest time and efforts in life-long learning activities to develop and build personal relationships with internal and external professional clients as well as with other individuals whom we interact on a personal basis.

Realized the importance of this Felstead, Gallie & Green (2019), discussed in a job context skill is explained as the required level of worker to perform the given task, involving the use of their skills and abilities and the extent to which workers receive training that develops job-related and task. Significantly it allows the employees to have a special capability in performing the responsibilities and making use of their professional skills to perform their assigned task in the institution. Moreover, employees' skill development aims not only to expose them to lifelong learning but also to improve their employability and their quality of life and contribute to sustainable organizational development.

Experience

In a research context theoretically, a human capital perspective suggests that people are rewarded for their investment in undertaking professional assignments as this increases their knowledge, skills and experience which can be used to organizational advantage in general. Commonly, in developing a human capital strategy organizations make decisions regarding how to acquire human capital to meet the needs of the organization Harris et. Al (2024). This is important because the decision determines how the organization sees how each strategy is better to meet the needs of the organization. Then Becker (1964) makes a distinction between human capital investments, such as education and work experience and actualized human capital outcomes, such as knowledge and skill required to perform the specific task. The concept of human capital as a means of framing the development of knowledge and experience has immense relevance to the organization itself (Shortland & Porter, 2020).

Ability

A wide definition of human capital typically includes both an individual's intrinsic qualities and abilities as well as the knowledge and skills they pick up from education and training. Through the acquisition of new knowledge, skills, and abilities (KSA), employees are likely to become more productive and achieve better results. As introduced by Schultz (1961), investment in skills and knowledge provides individuals with "human capital", comprising knowledge, skills, and abilities, and this generates productive capacity, leading to the creation of wealth. According to Lenihan, Mcguirk, & Murphy (2019), the employee's ability attributes like cognitive ability, general knowledge, job-specific knowledge, and problem-solving skills are essential to perform the task more effectively.

As highlighted by Alawamleh, Ismail, Aqeel & Alawamleh (2019), the interpretation of human capital was first introduced by Adam Smith in *The Wealth of Nations* in 1776. He defines it as one aspect of capital, along with land, labor, and monetary capital. The way to improve human capital quality is through training, education, and experience so that an enterprise becomes more profitable, not only at the individual level but also adds to the collective wealth of society. Moreover, the organization should also play a role in optimizing the individual level by systematically identifying the employee's need as one of the investment activities and outcomes.

The following discussion explains that there is a relationship between the human capital investment factors and the institutions' performance.

H^1: Training has positively influenced the institutions' performance.

H^2: Education has positively influenced the institutions' performance.

H3: Knowledge has positively influenced the institutions' performance.
H4: Skill has positively influenced the institutions' performance.
H5: Experience has positively influenced the institutions' performance.
H6: Ability has positively influenced the institutions' performance.

3. Research Methodology

To achieve the research objective, the process continues with data collection activity. Feedback from the targeted respondents was gathered. For this purpose, a series of sixty questionnaires was employed. Next, the model selected is Structural Equation Modeling-Partial Least Square (SEM-PLS) with PLSPM - R package Programming, where abnormal data, small sample size, and the possibility of using indicators with few references are the most prominent reasons for the application (Hair, 2014).

Then the software Smarts PLS 3 was used by Ringle et al. (2015) for the data analysis to assess the measurement and structural model. The measurement model consists of the outer and inner tests to obtain indicators/factors reflecting the latent variables and determine the relationship. The main purpose of conducting these tests was to assess the outer model through convergent (AVE Value), discriminant (Loading value), and validity (Cronbach's alpha value) tests.

Convergent validity for the measurement model was investigated by recognizing the Average Variance Extracted (AVE) value. AVE is a method used to estimate the convergent validity of the measurement model. For the estimation, the AVE must exceed than 0.5 to gain an acceptable convergent validity. Next the Composite reliability (CR) value must be 0.7 or above is deemed to be acceptable. Table 2 shows the results of the measurement model. By implementing the Smarts PLS the responses gathered were analyzed for assessing the reliability of measurement. The recorded Cronbach Alpha for all variables employing multi-items estimated range exceeds 0.9 which suggests that the questionnaires were reliable for further analysis as cited in Kline (2011). Next is the assessment of the structural model which provides the relationship between latent variables in the research model. The following criteria facilitate this assessment: Coefficient of determination (R^2), cross-validated redundancy (Q^2), and path coefficients (Hair et al., 2014). Finally, Table 4 shows the path coefficient of assessment of all items.

Population and Sampling

The total population for this research comprised 309 lecturers, with a sample of 95 lecturers from the UiTM Kelantan Branch. Faul, Erdfelder, Lang and Buchner (2007) indicate that G*Power software can be used to determine the sample size based on the statistical power. The minimum required sample size is 74 respondents given an actual statistical power of 0.95 for model testing. However, for analysis reasons, all 95 questionnaires were evaluated.

Demographic profiles

The purpose of assessing the demographic profile is to identify the characteristics of targeted respondents. Thus, the overall sample shows there are 71 female respondents with a percentage of 74.7% as compared to only 24 male respondents with 25.3%. From the overall population based on age, the highest frequency of respondents is 31-40 years old with a total of 56 (58.9%) followed by 41-50 years old with 26 (27.4%), then 51-60 years old with 8 (8.4%) and below 30 years old with 5 (5.3%). The highest faculty members were from Faculty of Business Management with 37 respondents (38.9%) followed by Faculty of Computer Science and Mathematics with 18 respondents (18.9%), Faculty of Information Management 13 respondents (13.7%), Academy of Language 12 respondents (12.6%), Faculty of Art and Design 6 respondents (6.3%), Faculty of Accounting 5 respondents (5.3%) and Faculty of Administrative Science and Policy 2 respondents (2.1%) and Academy of Contemporary Islamic 2 respondents (2.1%).

4. Results and Discussion

Common method variance (CMV)

Podsakoff and Organ (1986) indicate that common method variance (CMV) refers to variance caused by the measurement method rather than the constructs that measures are intended to represent. To assess CMV,

Harman's Single Factor test involves entering all primary constructs into principal component factor analysis, where the percentage of variance explained should be less than 50%. The results revealed that the variance accounted for all factors was 49.25%, indicating that there is no common method issue present in the dataset as supported by Podsakoff and Organ (1986).

Measurement Model

Before evaluating the structural model, the measurement model was constructed to assist the analysis process. This process began with assessing the convergent validity of the latent constructs. The first step requires that the factor loadings should be 0.7 or higher. Additionally, the Average Variance Extracted (EVA) should exceed 0.5 for acceptable convergent validity, and the Composite Reliability (CR) must be 0.7 or above (Hair et al.,2014). Then the assessment revealed that items C2, with a loading of 0.626 and C6 with a loading of 0.621, were excluded from the data set because the loading values did not meet the 0.7 threshold (Hair, Hult, Ringlet & Sarstedt,2014). Lastly, the measurement model is presented in the GoF table.

Table 1: Goodness-of-fit measurement model (n=95)

Latent Variable	Factor Loading	CR	AVE
Institution Performance (IP)	0.933	0.942	0.539
Training (TR)	0.945	0.954	0.722
Education (ED)	0.943	0.953	0.717
Knowledge (KN)	0.947	0.956	0.731
Skill (SK)	0.941	0.954	0.774
Experience (EX)	0.953	0.963	0.811
Ability (AB)	0.954	0.963	0.812

The analysis continues with assessing the result of discriminant validity. The discriminant validity is tested by means of assessment for Fornell Larcker, cross loadings and the Heterotrait-Monotrait ratio (HTMT). As displayed in Table 2 the square root of AVEs is greater in all cases than the off-diagonal elements in the corresponding row and column, so that the required discriminant validity by Fornell-locker has been achieved. This is because the square root of the AVE when compared against the correlations of the other constructs, the AVE extracted is greater than its correlations with all the other constructs then discriminant validity has been established.

Validity Assessment of Factor Loading, CR and AVE, Fornell and Larcker

Table 2: Fornell-Larcker criterion (n=95)

	AB	ED	EX	IP	KN	SK	TR
AB	**0.901**						
ED	0.644	**0.847**					
EX	0.765	0.703	**0.900**				
IP	0.473	0.502	0.528	**0.734**			
KN	0.576	0.745	0.697	0.709	**0.855**		
SK	0.433	0.566	0.552	0.730	0.816	**0.880**	
TR	0.574	0.669	0.612	0.725	0.798	0.689	0.850

Note: Values in the diagonal (bolded) represent the square root of the AVE while the off-diagonals are correlations

As shown in Table 2, the square root of the Average Variance Extracted (AVE) is greater in all instances than the off-diagonal elements in their respective rows and columns, indicating that the necessary discriminant validity, as outlined by Fornell and Larcker, has been achieved. This means that when the square root of the AVE is compared to the correlations with other constructs it exceeds those correlations confirming the establishment of discriminant validity. Then the second option (Table 3) to assess the discriminant validity is conducting the Heterotrait-Monotrait (HTMT) test Henseler et al. (2015). The rules of thumb stated if the HTMT

Value is greater than 1.0, then there is a problem with discriminant validity. Subsequently, Garson (2016) explained the value must be lower than the required threshold value of HTMT for the assessment. Therefore, for this HTMT assessment, all constructs do not exceed the threshold. Therefore, this dataset does not demonstrate a problem with discriminant validity.

Table 3: Heterotrait-Monotrait ratio (HTMT) (n=95)

	AB	ED	EX	IP	KN	SK	TR
AB							
ED	0.673						
EX	0.805	0.735					
IP	0.492	0.524	0.548				
KN	0.605	0.788	0.729	0.810			
SK	0.454	0.596	0.578	0.775	0.863		
TR	0.602	0.706	0.644	0.762	0.843	0.725	

Assessment of Structural Model

The relationship between the latent variables in the research model is provided by the structural model. The following criteria facilitate this assessment: Coefficient of determination (R^2), cross-validated redundancy (Q^2), and path coefficients (Hair et al., 2014). Table 4 shows the path coefficient of the item. The result shows a positive relationship between knowledge on the institution's performance with β=0. 451 and significant with t-value= 2.774 and p<0.05, next is a positive relationship of skill towards institution performance with β=0. 283 and significant with t-value= 1.981 and p<0.005. Finally, the analysis shows there is a significant positive relationship between training to institution performance with β=0. 299 and significant with t-value= 2.371 and p<0.05

Table 4: Significance result of path coefficients (n=95)

Hypo	Path	Beta value	Sample Mean	Std. error	t-value	P-value
H1	AB→IP	0.093	0.099	0.100	0.933	0.351
H2	ED→IP	-0.218	-0.184	0.162	1.348	0.178
H3	EX→IP	-0.027	-0.045	0.120	0.226	0.821
H4	**KN→IP**	**0.451**	**0.418**	**0.162**	**2.774**	**0.006**
H5	**SK→IP**	**0.254**	**0.283**	**0.128**	**1.981**	**0.048**
H6	**TR→IP**	**0.299**	**0.292**	**0.126**	**2.371**	**0.018**

Note: ** Significant at p<0.005 (p<0.05)

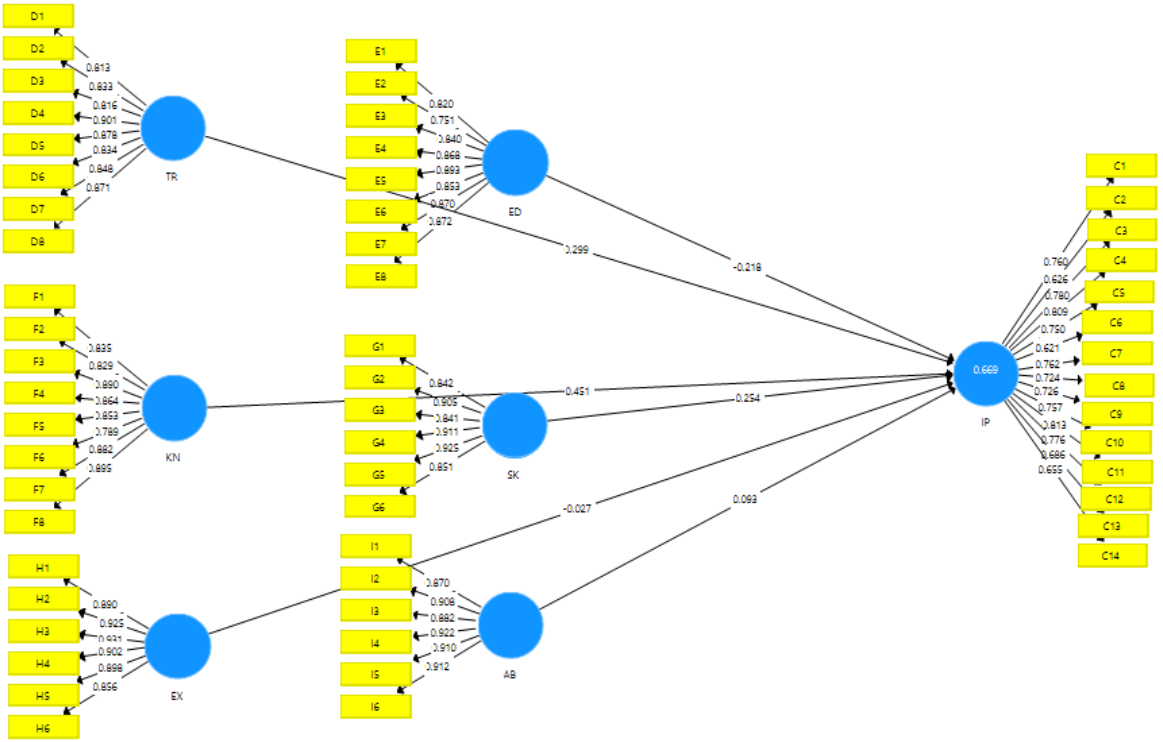
Assessment of the predictive relevance -Q^2

As demonstrated by the blindfolding procedure outlined by Hair et al. (2014), Q^2 assesses the predictive validity of a model using PLS (see Table 5). Q^2 values greater than zero suggest that the exogenous constructs hold predictive relevance for the endogenous construct. According to Hair et al. (2014), a Q^2 value above zero indicates that exogenous constructs are relevant predictors of the endogenous construct.

Table 5: Predication Relevance of the Model

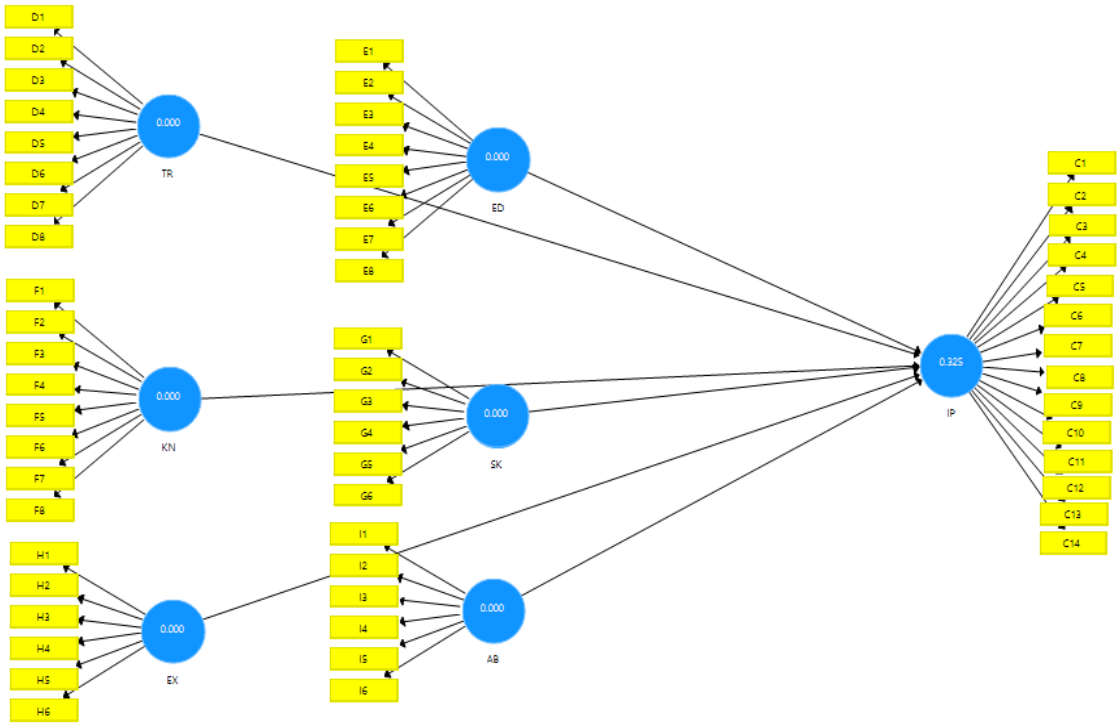
Latent	SSO	SSE	Q^2 (=1-SSE/SSO)
Ability	570.000	570.000	
Education	760.000	760.000	
Experience	570.000	570.000	
Institution Performance	1,330.00	897.403	0.325
Knowledge	760.000	760.00	
Skill	570.000	570.000	
Training	760.000	760.000	

Figure 1: PLS-Path diagram



As shown in Figure 1, the R^2 value for the endogenous latent variable is 0.669, indicating that 66.9% of the variance in institutional performance can be explained by the human capital investment factors among the respondents.

Figure 2: Blindfolding model (DV)- *Q^2*



The following Figure. 2, shown Q^2 for institution performance (=0. 325), which means the research model has good predictive relevance.

Table 6: The Hypotheses Analysis (n=95)

Hypotheses	Path	Results
H1: Ability has positively influenced the institutions' performance.	AB→IP	Not supported
H2: Education has positively influenced the institutions' performance.	ED→IP	Not supported
H3: Experience has positively influenced the institutions' performance.	EX→IP	Not supported
H4: Knowledge has positively influenced the institutions' performance.	KN→IP	Supported
H5: Skill has positively influenced the institutions' performance.	SK→IP	Supported
H6: Training has positively influenced the institutions' performance.	TR→IP	Supported

The study's findings are applied to address the topic of how an institution's performance in UiTM is impacted by its investment in human capital activities. To sum up, among these six variables, three variables are not significant consists of ability, education, and experience, and another three variables: knowledge, skill and training are significant towards the performance as displayed in Table 6. To review training is the most significant factor that affects performance with β=0. 299 and significant with t-value= 2.371 and $p<0.05$.

5. Conclusion

Hermanus et al., (2024) stated in evaluating the university performance there are a few other components of assessment that should be considered including assessing the different stakeholder needs, including government agencies, businesses, and international institutions and how external factors, like government grants, industrial partnerships, and international collaborations, affect it. Moreover, Leal Filho et al. (2021) suggest that involvement in the activity like research projects, conferences, workshops, and project-based learning also positively contribute to the long-term sustainability of a university. In summary, the findings are consistent with well-established research regarding human resource systems, human capital, and institution performance, that organizations adopting high-involvement human capital development systems to enhance the achievement of the overall goal of positive organizational performance**.** There is no doubt human capital plays a crucial role in the current ever-challenging and aggressive business environment and human resources have the greatest importance in gaining sustainable competitive advantage and efficiency (Pasban & Nojedeh, 2016). Organizations aiming for success and competitiveness must actively seek out and implement better strategies to enhance their business performance by effectively leveraging their human capital.

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Navigating the Social Shift: A Preliminary Study of Consumer Behavior on Malaysia's Social Commerce Platforms

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Abstract: The proliferation of online businesses coupled with the advancement of information and communication technologies (ICT) has led to the emergence of social commerce. The integration of social media platforms into e-commerce offers businesses a convenient avenue for engaging with consumers and a novel method for capturing additional sales volume. This seamless integration of social media platforms into current e-commerce practices has significantly increased its success. Research on the factors that affect purchase intentions in social commerce is still sparse, especially in the context of Malaysian consumers. In general, the causal model of purchase intentions on social commerce in this study aims to investigate the impact of the constructs of visibility and metavoicing on purchase intentions among Malaysian millennial consumers. Henceforth, this initial study specifically aims to evaluate the reliability and validity of the IT affordance constructs of visibility and metavoicing through rigorous assessments. At the items-construct level, the internal consistency assessment was conducted using McDonald's Omega, which is known for its robustness in measuring the reliability of multi-item constructs. At the construct level, discriminant validity and the strength of linear relationships among variables were assessed using Pearson correlation analysis. The pilot dataset gathered was analyzed with SPSS 29, and the results have validated that the predictive model achieved high levels of reliability and validity at both the item and construct levels. Furthermore, the analysis revealed that the independent variables, metavoicing and visibility, have a significant association with purchase intentions, underscoring their importance in understanding consumer behavior.

Keywords: *Social Commerce, Intention to Purchase, Metavoicing, Visibility and Reliability*

1. Introduction and Background

With the rapid integration of social interaction in online shopping, social commerce is one innovative combination that allows customers to engage directly during purchase activities within social media environments. The emergence of social media platforms has shifted the landscape of e-commerce. The current adoption rate of Web 2.0 technologies, combined with the increasing reliance on communication and information technologies (ICT), has facilitated the integration of interactive social elements with the transactional capabilities of e-commerce, leading to its rapid rise in popularity (Baghdadi, 2013). Conversely, Ntumba (2023) explains that e-commerce is heavily dependent on leveraging social elements and other information technologies. The expansion of social commerce in Malaysia is particularly significant, as a considerable proportion of social media users are influenced by recommendations and content shared within these networks (Wok & Mohamed, 2017; Nikolinakou, 2020).

The study generally aims to investigate the purchase intention model of social commerce that underlines the influential factors that drive the intention to purchase in social commerce relative to the Malaysian market. Indeed, this preliminary study's outcome may enhance understanding of consumer behavior and insights for firms to optimize their social commerce strategies. Despite numerous studies exploring social media's effects, few have systematically compared its positive and negative impacts or proposed countermeasures. Henceforth, at the very initial stage, this study seeks to assess the reliability and validity at the items and construct level. Regarding the internal consistency of questionnaire items, measurement of constructs, namely visibility, meta voicing, and purchase intention, will be carried out using McDonald's Omega. In addition, Pearson correlation is utilized to assess the discriminant validity at the construct level as well as the relationships between variables. By doing so, it not only highlights the reliability and validity of the causal model of social media marketing in predicting consumer engagement but also explores the psychological and behavioral associations that drive consumer behavior, especially in intention to purchase in social commerce.

2. Literature Review

Purchase Intention

In the evolving landscape of consumer behavior, purchase intention has become a focal point of research, revealing the intricate factors that drive consumers toward acquiring products or services. According to Picaully (2018), the strength of a person's intention is demonstrated through a series of motivated actions aimed at obtaining a desired object. This process is further enriched by the work of Permatasari & Roosinda (2020), who highlight that the motivation sparked during the purchasing process becomes a powerful and persistent force in a consumer's decision-making journey. Customers' purchase intention is the measure of the chance or probability that customers have of engaging in a purchasing behavior (Ping, 2022). Conversely, the latter indicates the degree of dedication or excitement that individuals possess towards making a transaction. Furthermore, it also elucidates the individual's inclination to procure or possess a product or service in the near or forthcoming time. Purchase intention is a crucial stage in the process of making a purchase choice, it serves as an initial indicator of the actions that individuals will carry out, sometimes referred to as consumers in this context (Chiang & Dholakia, 2003). In line with the aforementioned, Jannah & Takarini (2023) describe purchase intention as a phase where consumers plan or desire to buy a particular product, signifying a critical step in the purchasing process.

The complexity of consumer purchasing interest is underscored by Puspawati & Febrianta (2023), who argue that it should be a primary concern for marketers aiming at the factors that influence consumer decisions. Saffanah et al. (2023) echoed similarly by identifying transactional, referential, preferential, and exploratory indicators as key dimensions of purchase intention, offering a structured approach to understanding consumer behavior. Analyzing consumers' purchase intentions allows an organization to tailor their marketing strategies to better meet the needs and preferences of its target demographic, leading to increased sales and enhanced customer satisfaction (Kim, 2002; Palmatier, 2019; Rane, 2023). Purchase intentions are particularly relevant because they are widely recognized as a primary predictor of actual consumer behavior (Montano & Kasprzyk, 2015). Consequently, understanding these intentions is crucial for the success of online retailers. Identifying and examining the factors that influence purchase intentions is essential, as it enables organizations to make informed decisions about product development, pricing, and promotional strategies, thereby shaping consumer behavior and driving sales (Toha, 2023). Therefore, this study will focus on exploring purchase intention as the primary variable of interest.

Visibility and Purchase Intention

A crucial aspect influencing purchase intention in the digital age is the concept of visibility affordance. In the context of consumers' purchasing actions on social media platforms, the term "visibility" refers to the availability of accessible entry to products along with the visibility of product information (Dong et al., 2016). Visibility is a very important factor in deciding what people will buy, especially online in places like live shopping and social media marketing. According to Dong and Wang (2018) and Shin et al. (2024), visibility in this case means how much information about the product is visible to customers and how well products are shown during live sessions. Visibility affordance, as Zhang (2022) notes, refers to the visual accessibility and attractiveness of live broadcast content, which helps consumers form a functional perception of goods. This is particularly relevant in livestream e-commerce, where the visualization of shopping scenes and sales processes can lead to impulsive purchasing decisions. Moreover, according to Chen (2024), visibility is closely related to perceived diagnosticity, which is the ability of consumers to correctly judge product quality and fit according to the information given. It has been shown that higher perceived diagnosticity makes people more likely to buy, especially older people who may value careful evaluation before making purchases. Then visibility, whether it's through live demos or interesting material on social media, is a key factor in getting people to want to buy on all digital platforms.

Based on the previous literature, therefore, the following hypothesis was formulated:

H1: *Visibility has a positive relationship with purchase intention in social commerce platforms.*

Metavoicing and Purchase Intention

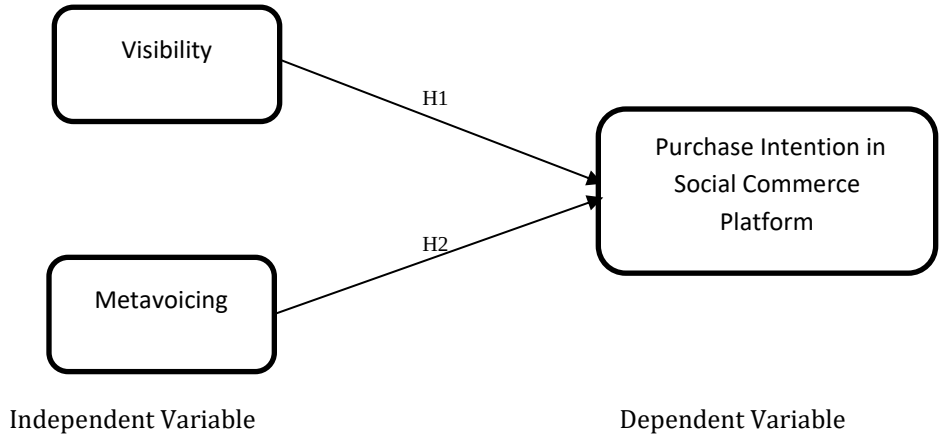
Metavoicing on social media, which involves adding opinions through likes, comments, and ratings on others' content (Liu-Thompkins et al., 2020) plays a significant role in shaping online discussions and generating extensive qualitative data (Waxa & Gwaka, 2021). The accessibility of metavoicing capabilities can simplify the process for customers to locate important product information (Fengliang & Jianhong 2021), enhancing their decision-making. Furthermore, Nurhapizah (2024) highlights that metavoicing allows customers to directly

engage with streamers in chat rooms, where immediate responses to questions can be provided, ultimately reducing consumer uncertainty about the products. Dong et al. (2016) describe metavoicing affordance as the extent to which social commerce technology allows consumers to express their opinions about a product. Furthermore, consumers can continue interacting with the seller after the seller has responded to their prior query, demonstrating that metavoicing allows communication to continue (Sun et al., 2019). As a result, metavoicing enables merchants to make a welcoming first impression. This can assist consumers focus their attention on their present live shopping activities and create an immersive experience (Sun et al., 2019). A study by Saffanah (2023) indicates how metavoicing affordance in live purchasing on Instagram can improve engagement. Buyers comment on the online social commerce platform through a two-way interaction with sellers. This informal conversation enables the exchange of product information and solving transactional concerns. Aggregating various thoughts and ideas through an interactive discourse focused on the metavoicing capability raises the level of engagement between buyers and sellers (Sun, 2019). This interaction, often seen in live-stream shopping environments through chat rooms or bullet screens, fosters a closer connection between customers and sellers, enhancing trust and ultimately driving purchase intention Zhou et al. (2022). Collectively, these factors provide a comprehensive understanding of the elements shaping consumer behavior, offering valuable insights for marketers seeking to optimize their strategies in a rapidly evolving digital marketplace. Based on the previous literature, therefore, the following hypothesis was formulated:
H2: *Metavoicing has a positive relationship with purchase intention in social commerce platforms.*

Research Framework

Figure 1 shows the proposed framework for this study. The two independent variables are visibility and meta-voicing. Meanwhile, the dependent variable is purchase intention. The research framework also displays the hypothesized relationships proposed in the study.

Figure 1: Framework



3. Research Methodology

The primary objective of this study is to assess the reliability and validity of the social commerce purchase intention model as well as the association between the independent variables of visibility and metavoicing on the dependent variable, namely purchase intention. This study uses a mono-method quantitative study, which means that it will be utilizing only one data type, which is gathered through a research instrument of questionnaire survey. This study is cross-sectional, where all data are gathered at once, and the research design adopted is based on predetermined measurements using structured and validated data. The survey instrument will be distributed through an electronic platform based on a purposive sampling technique via Google Forms to all millennial users in Johor, Malaysia. Millennials, generally characterized as those born between 1981 and 1996, constitute a substantial demographic on social media sites (Pew Research Center, 2018). They are recognized for their digital proficiency, having matured alongside the emergence of the internet, mobile technology, and social networking (McHaney, 2023). The characteristic respondents for this study are the millennial social media users located in Johor who don't have experience shopping online through social media platforms. Respondents that were chosen must have at least one social media account. Additionally, an initial

question will screen respondents to confirm that they have never made purchases using social media accounts, ensuring their suitability for this study and the quality of the results obtained. A few sample size recommendations for pilot studies were found based on the behavioral study research methodology. In a discussion of exploratory and pilot studies, Isaac and Michael (1995) proposed that "samples with number of sample (N) between 10 and 30 have many practical advantages", including simplicity, simple calculation, and the capacity to test hypotheses. Hill (1998) also stated similarly that pilot surveys in research should involve a range of 10 to 30 participants. Therefore, for this study, a sample of 30 respondents was used for analysis.

Face Validity

The questionnaires adopted in this study were based on previous research conducted by Dong and Wang (2018), Chandrruangphen (2022) and Weismueller (2020). Before conducting the study, it was essential to ensure the validity of the instrument being used. At the initial stage of item confirmation, a subjective evaluation was crucial to determine whether the items appeared to assess what they were intended to measure (Churchill, 1979; Schriesheim, Powers, Scandura, Gardiner, & Lankau, 1993). This evaluation involved assessing face validity, which Fink (1995) defined as "the degree to which an instrument appears to have been developed in a way that makes it likely that it would be understood and completed by its intended respondents." To ensure the instrument accurately detected what it was supposed to test, the researcher sought the expertise of four specialists in the areas of marketing, scale development, and bilingual questionnaire design, with options in both English and Bahasa Melayu. Additionally, the outcome of the validity assessment (Face validity) on the instrument used in this study has demonstrated an appropriate level of face validity and reinforced the assumption of items-construct level validity for the study.

4. Results

Descriptive Analysis Results

The study collected 30 survey questionnaires, which Hill (1998) and Michael (1995) consider satisfactory. According to the information, the majority of millennial respondents (80%) were female, with male respondents representing 20%. In terms of age distribution, the majority of respondents were 33-37 years old and 28-32 years old, with 36.67 percent. Furthermore, 16.67% of respondents are between the ages of 38 and 42, with 10% falling inside that age range. Tables 1, 2, and 3 below represent the summary of descriptive analysis outcomes for each construct namely visibility, metavoicing and intention to purchase.

Table 1: Descriptive statistic for visibility

Visibility	Mean	Std Dev
The online social media platform provides me with a detailed picture of the product.	3.967	0.850
The online social media platform makes the product attributes visible to me.	3.600	1.00
Online social media platforms make information about how to use products visible to me.	3.967	0.765
Online social media platforms help me to visualize products like in the real world.	3.833	0.747
I have seen others using online social media platforms.	4.433	0.626

The descriptive analysis of items measuring the visibility construct indicates that respondents generally view online social media platforms positively regarding their ability to provide product information. Overall, for visibility, the mean scores for the items range from 3.600 to 4.433, indicating a high level of agreement and considerably low standard deviation, ranging from 0.626 to 1.00, reflecting low to moderate response variability.

Table 2: Descriptive statistic for meta-voicing

Metavoicing	Mean	Std Dev
Online social media platform helps me to visualize products like in the real world.	4.067	0.868
Social media platform allows me to react to sellers' feedback on products.	4.167	0.747
Social media platform allows me to share sellers' opinions about products.	4.267	0.691
Social media platform allows me to join in sellers' communal discussions on products.	3.767	0.858

For metavoicing, the mean scores range from 3.767 to 4.267, demonstrating strong agreement among participants. The standard deviations, from 0.691 to 0.868, indicate low to moderate variability in responses. This suggests that while there is a consensus on the effectiveness of meta-voicing features, there is some variation in individual experiences.

Table 3: Descriptive statistics for Purchase Intentions

Purchase Intentions	Mean	Std Dev
I can imagine buying (products/services) through social media platforms.	3.900	0.8544
The next time I buy (products/services), I will consider this social media platform.	4.000	1.017
I am very interested in buying (products/services) from social media platform	4.000	1.017
I will consider the social media platform as my first shopping choice.	3.733	1.112
I intend to purchase products or services through social media platforms.	4.067	0.868
I expect that I will purchase the product or services through the social media platform	3.700	1.022

According to Table 3, the mean scores for Purchase Intention items range from 3.700 to 4.067, showing generally high purchase intentions among participants. The standard deviations, ranging from 0.854 to 1.112, indicate some variability in these intentions. Overall, while there is a strong inclination towards purchasing, individual responses vary to a moderate extent.

Internal consistency

To ensure the robustness of the study model, both reliability and validity must be established before conducting the main analysis. Validity analysis assesses how well a test meets its intended purpose and application, extending beyond basic quantitative data analysis (Riege, 2003). Verifying item-construct reliability is essential before proceeding with field or empirical studies, and internal consistency should be evaluated using actual field data (Weigle, 2007). O'Neill (2003) emphasizes that ensuring reliability at the item-construct level is an ongoing process involving method analysis, outcome evaluation, and continuous refinement.

Reliability is crucial for test quality, reflecting the consistency and replicability of results across different situations (Hajjar, 2018; Aven, 2012; Leech, Barrett, & Morgan, 2014). High reliability is achieved when a measure consistently yields the same results under stable conditions (Neil, 2009). Although Cronbach's alpha is commonly used for internal consistency measurement, this study employs McDonald's Omega, which is considered a more accurate metric. Research indicates that Omega provides a better measure of internal consistency compared to alpha and other alternatives (Zinbarg et al., 2005; Raykov, 1997; Zinbarg, Yovel, Revelle, & McDonald, 2006; Graham, 2006; Zinbarg, Revelle, & Yovel, 2007; Revelle & Zinbarg, 2009). Omega minimizes the risk of overestimating or underestimating reliability. Cronbach's alpha is reliable only if the assumptions of the tau-equivalent model are met (McDonald, 1981; Green et al., 1977; Shevlin, Miles, Davies, & Walker, 2000; Revelle & Zinbarg, 2009), making it less suitable for scales measuring distinct areas or processes (Cronbach & Shavelson, 2004).

Table 4: Internal Consistency Assessment

Variables	Mc Donald Omega
Visibility	0.738
Metavoicing	0.832
Purchase Intention	0.948

Referring to Table 4 above, the reliability values for the variables range from 0.738 for visibility to 0.832 for metavoicing, with purchase intention reaching 0.948. These values demonstrate that the item-construct levels have achieved an acceptable reliability coefficient, all exceeding the 0.7 threshold. According to the literature,

McDonald's Omega values should surpass 0.70 to ensure acceptable internal consistency (Alpar, 2014; Soysal, 2023).

Pearson Correlation Results

Correlational analysis was used to determine the relationships between the variables, which further advances to determine the discriminant validity. As for discriminant validity assessment, the analysis outcome of Pearson correlation analysis advanced the validity assessment of discriminant validity at the construct level. This validity assessment focuses on the correlations between independent variables. Referring to Table 5, the result from the Pearson correlation confirmed that the constructs employed in this research model were distinct as the correlation between independent variables does not exceed r=0.7, thus achieving discriminant validity.

In addition, the Pearson correlation results can determine the relationship between visibility and metavoicing (independent variable) and purchase intention (dependent variable). As indicated in Table 5 below, the Pearson correlation coefficients showed the association between independent variables and dependent variables was a significant positive relationship. The correlation between visibility and intention to purchase is r=0.692 and sig.<0.001; this shows a moderately significant relationship (Cohen, 1978). On the other hand, the correlation between meta voicing and intention to purchase was explicated likewise with coefficient r=0.563 and sig. <0.001. The analysis reveals a strong positive correlation between visibility and purchase intention (Cohen, 1978).

Table 5: Summary of Pearson Correlation Analysis

	Purchase Intention	Visibility	Metavoicing
Purchase Intention	1	.692**	.563**
Visibility	.692**	1	.675**
Metavoicing	.563**	.675**	1

*Sig 1-tailed** <0.01*

5. Conclusion

The analyses confirmed that the scale items and constructs used in the model demonstrated acceptable reliability and validity. McDonald's Omega values exceeding 0.7 across all constructs validated the internal consistency and robustness of the measurement tools. Additionally, face validity was reinforced through expert evaluation, further supporting the validity of the measurement items. The discriminant validity assessment ensured that the constructs were distinct from one another, confirming the model's validity and suitability for further empirical study.

The preliminary study also explored the direct relationships between the independent variables—visibility and metavoicing—towards purchase intention. Pearson correlation analysis revealed that visibility has the strongest correlation with purchase intention, indicating that higher visibility is strongly associated with increased purchase behavior. Metavoicing showed a moderate positive correlation with purchase intention, suggesting that engagement in metavoicing activities positively impacts purchase intent. Furthermore, the strong positive correlation between visibility and metavoicing highlights their interconnectedness within consumer behavior.

These findings support the hypothesis that both visibility and metavoicing are significant predictors of purchase intention, with visibility having a more dominant effect. The results underscore the importance of enhancing visibility and fostering metavoicing to drive consumer engagement and purchase behavior. The reliable measurement of these constructs, validated through McDonald's Omega, affirms the questionnaire's effectiveness in capturing the nuances of consumer behavior. The positive correlations identified suggest that businesses and marketers can strategically leverage visibility and metavoicing to influence purchase intentions, potentially leading to increased sales and customer loyalty. This study offers valuable insights for both academic research and practical marketing applications.

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Appendix 1

Visibility	
No	**Items**
1	The online social media platform provides me with a detailed picture of the product.
2	The online social media platform makes the product attributes visible to me.
3	Online social media platform makes information about how to use products visible to me.
4	Online social media platform helps me to visualize products like in the real world.
5	I have seen others using online social media platforms.
Metavoicing	
No	**Items**
1	Online social media platform helps me to visualize products like in the real world.
2	The social media platform allows me to react to sellers' feedback on products.
3	The social media platform allows me to share sellers' opinions about products.
4	The social media platform allows me to join in sellers' communal discussions on products.
Purchase Intention	
No	**Items**
1	I can imagine buying (products/services) through social media platforms.
2	The next time I buy (products/services), I will consider this social media platform.
3	I am very interested in buying (products/services) from social media platforms.
4	I will consider the social media platform as my first shopping choice.
5	I intend to purchase products or services through social media platforms.
6	I expect that I will purchase the product or services through social media platforms.

Source : Dong & Wang (2018) ; Chandrruangphen (2022) & Weismueller (2020)

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What Makes Customers Choose Certain Courier Services Over the Others?

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Abstract: The COVID-19 pandemic has proliferated courier service companies due to increasing customer demand. Customers prefer some courier service companies over others because of certain factors, including timeliness, order discrepancy, personal contact quality, order condition, and operational information sharing. The study investigates the factors contributing to customer satisfaction when choosing courier services. A survey questionnaire was distributed to customers to gauge their overall level of satisfaction and assessment of potential contributing factors. Respondents were selected from those who have experience using the courier service. From the results of multiple regression analysis, four factors, timeliness, personal contact quality, order condition, and operational information sharing, significantly influence customer satisfaction when choosing courier service. Order discrepancy does not significantly influence customer satisfaction because customers trust the courier service providers to provide the service as expected. The implications of the study are discussed in the paper.

Keywords: *Customer satisfaction, courier service, logistics, service quality*

1. Introduction and Background

The courier service arranges and executes last-mile delivery of packages and goods. At the helm of this operation are courier managers, who oversee the arrangement of order deliveries, assignment to couriers, and management of operations while couriers are on the road. They also play a crucial role in making strategic recommendations for future planning. Depending on a company's size and complexity, courier management may include vehicle control, fuel management, and courier expense approvals. Many courier service companies in Malaysia include JNT, POS LAJU, DHL, FedEx, Ninja Van, etc. Customer satisfaction is critical in measuring a company's success through the company's services. Customer satisfaction is characterized as the customer`s evaluation of a product or service regarding whether that product or service has addressed the customer's needs and expectations (Bungatang & Reynel, 2021). Customer satisfaction is measured to guarantee that customers continue to purchase, increase their purchases, and suggest service providers based on service quality.

Nowadays, courier services companies do not take the quality of services seriously. What has happened lately has made people lose trust in some services. For example, the viral video about the JNT employees who threw the customer's parcel, slow delivery by POS LAJU, and so on made their customers lose trust and choose the other services instead. To get their customers' attention back, the company should improve its services to regain public trust. Since courier services have become one of the critical services in Malaysia, a good reputation should be cared for by the companies to catch the spotlight in the industry.

This study was conducted to investigate factors influencing customer satisfaction in the courier service industry and to determine whether customers are satisfied with the service they receive from courier companies. The study focused on several factors or dimensions that determine customer satisfaction: timeliness, order discrepancy, personal contact quality, order condition, and operational information sharing.

2. Literature Review

Customer Satisfaction

Customer satisfaction is a central concept in marketing literature and is an essential goal of all business activities. Today, companies face their toughest competition because they move from a product and sales

philosophy to a marketing philosophy, which gives a company a better chance of outperforming the competition (Paley, 2021). Customer satisfaction with courier services needs to be improved by the customer service team to ensure that the customer feels satisfied (Libo-on, 2021). Satisfaction can be measured through the service quality dimensions, the higher rate of the service quality dimensions, and the level of satisfaction that could be attained by the service provider (Bungatang & Reynel, 2021). In terms of services, customer satisfaction will be measured by the service quality that is delivered to the customer (Uzir et al., 2021). Customer satisfaction is vital to fulfilling customer perceptions of the service provided. Customers will keep purchasing the products or services if they benefit from them. Courier service providers need to predict critical features that lead to customer satisfaction. The dependent variable for this study is customer satisfaction, which refers to the central problem the researchers focus on.

The best theory to explain an evaluation framework for logistics service quality is the SERVQUAL model, developed by Parasuraman, Zeithaml, and Berry (1988). This model focuses on five dimensions of service quality: reliability, assurance, tangibles, empathy, and responsiveness. In logistics service quality, these can map to timeliness, order accuracy, employee interaction, and information sharing. The SERVQUAL model is widely used to assess gaps between customer expectations and perceived service, making it ideal for frameworks measuring performance in logistics and supply chain contexts.

The Supply Chain Operations Reference (SCOR) model by Huan et al. (2004) can also complement this SERQUAL model by focusing specifically on supply chain performance metrics such as reliability and responsiveness. Both frameworks emphasize customer satisfaction through consistent and efficient service delivery. Based on the SERVQUAL model, five factors are identified to measure customer satisfaction in using courier services. The factors comprise timeliness, order discrepancy, personal contact quality, order condition, and operational information sharing.

Timeliness

Timeliness is the responsiveness of a system or resource to a user request. Traditionally, information availability has primarily been measured by the time an information resource is processed (uptime and downtime). Uvet (2020) conceptualized physical distribution service quality with three dimensions: timeliness, availability, and condition. Time utility is the most traditional and crucial feature of logistics service quality, and the creation of place utility is based on the perception of logistics service quality (Kaswengi & Lambey-Checchin, 2020; Uvet, 2020; Uvet et al., 2024). Therefore, the following hypothesis is proposed about the influence of timeliness on customer satisfaction. This timeliness refers to factors that lead to the problem, and the customers emphasize it as the quality of services.

Order Discrepancy

Order discrepancy handling is how logistics firms deal with differences in orders after arrival (Akturk et al., 2022). Logistics companies' performance in correcting discrepancies, such as wrong items and poor quality, significantly impacts customers' perception of the logistics service quality (Akil et al., 2022; Uvet, 2020). Order discrepancy is also a critical feature that leads to customer satisfaction, which courier service providers must focus on. It is crucial to avoid customer conflict that can decrease their trust in the service quality of courier services.

Personal Contact Quality

The quality and skill of communication of courier service personnel are the first meeting point of customers when they contact the business (Uzir et al., 2021). Personal contact quality is essential and leads to customer satisfaction (Ali et al., 2021). Customers will observe how the organizations handle and communicate with them because contact quality is essential. It shows that providing good personal contact quality to customers will give other opportunities to retain customers to use the services (Supriyanto et al., 2021).

Order Condition

This study hypothesizes a direct relationship between order condition and customer satisfaction because of the importance of order condition on the perception of satisfaction in the literature (Uvet, 2020). As one of the most critical dimensions of physical distribution service quality, order condition refers to damaged orders during delivery (Akil et al., 2022; Uvet, 2020; Uzir et al., 2021). Order conditions are critical to customers

because the condition of the items that they receive must be good. Satisfaction with the services will increase if customers are pleased with the condition of the delivered order.

Operational Information Sharing

Information sharing can be defined as the voluntary act of making information possessed by one another (Jäger-Roschko & Petersen, 2022). This operational information sharing depends on the organization's performance to deliver through their service delivery quality. According to Parasuraman et al. (1985), Uvet (2020), and Jamkhaneh et al. 2022), the logistics information systems used lately by logistic enterprises enable logistics services to increase their perception of service quality. The logistics information systems consist of internal and external information sharing (Hou et al., 2021). While the internal exchange of information in logistics services makes it possible to increase service quality by increasing the timeliness and accuracy of orders in service, external information sharing, which includes real-time information sharing with the customers, makes it possible to close the gap between clients' expected service quality (Wetzel & Hofmann, 2020). The service delivery process is essential in terms of expectations as much as the outcome of a service.

3. Research Methodology

The methodology is the specific procedures or techniques used to identify, select, process, and analyze information about the topic. For this study, a data collection method has been used to gain actual data from the customers who had used courier services like JNT, POS LAJU, and DHL. The data collection method is collecting information from all the relevant sources to find answers to the research problem, test the hypothesis, and evaluate the outcomes. This study used a primary data collection method via social media to distribute the questionnaire. The questionnaire was generated using Google Forms and then distributed to people using the WhatsApp application. Respondents were free to choose the score that relates to them on that Google form.

The study was conducted using a quantitative method or, specifically, a correlational design because we needed to collect and gain data related to our study. For that, a questionnaire on Google Forms was made. The period of gaining massive responses from respondents was open from November 2021 to December 2021, making it enough to be used in the study. From the data we obtained from respondents, 105 responses were received from the people who answered the questionnaire. It is enough as the target population was only focused on the ones that used courier services such as JNT, POS LAJU, DHL, etc.

This study focuses on various courier services in the industry, such as JNT, POS LAJU, DHL, and so on, and customer satisfaction with these services. Thus, this study only needs respondents with experience using courier services, which can be any random public. A population is defined as a group of individuals related to the study's objective; meanwhile, according to Lakens (2022), a population is an entire group you want to generalize the study's outcome. Thus, the population of this study is open to the public who use courier services. For the random numbers of the population for the respondents, the sample size that has been needed for the study is only 105.

Such considerations would help qualitative researchers select sample sizes and designs most compatible with their research purposes. Despite this study being focused on the public who have used the courier service, the sampling technique for this study is purposive sampling, which means that those who experienced using the service will be selected to answer the questionnaire.

4. Results

Based on the demographic profile, the number of respondents participating in the study was 105. These four parts of the demographic section start with age, gender, occupation, and academic status. For the age of the respondents, there are 16 (15.2%) respondents aged 18-21 years old, 77 (77.3%) respondents are in the range of age 22-25 years old, and 5 (4.8%) respondents are 26-29 years old. Besides, only one respondent (1.0%) was aged 30-33, and 6 (5.7%) were 34 years old and above. The total number of male respondents is higher than female respondents; 56 (53.3%) and 49 (46.7%) are female. Most respondents are unemployed, with 71 (67.6%) respondents being full-time workers, 23 (21.9%) respondents being part-time workers, and 11 (10.5%) respondents being part-time workers. Based on the academic status part, there are 5 (4.8%) freshmen,

2 (1.9%) sophomores, and 8 (7.6%) juniors. Most of the respondents are seniors, with a total number of 59 (56.2%), followed by 22 graduates (21.0%). Table 1 displays the demographic profile of respondents.

Table 1: Demographic and Geographic Information

Variables	Descriptive	Frequency	Percentage
Gender	Male	56	53.3
	Female	49	46.7
Age	18 - 21 years old	16	15.2
	22- 25 years old	77	73.3
	26 - 29 years old	5	4.8
	30 -33 years old	1	1.0
	34 years old and above	6	5.7
Occupation	Full-time work	23	21.9
	Part-time work	11	10.5
	Unemployed	71	67.6
Academic Status	Freshman	5	4.8
	Sophomore	2	1.9
	Junior	8	7.6
	Senior	59	56.2
	Graduate	22	21.0
	Did not study	3	2.9
	Others	6	5.7

Table 2: Demographic and Geographic Information

		Component				
		1	**2**	**3**	**4**	**5**
The time between placing the requisition and receiving delivery is short. (TL1)		.819				
Deliveries arrive on the date promised. (TL3)		.810				
The amount of time a requisition is on backorder is short. (TL2)		.591				
Correction of delivered quality discrepancies is satisfactory. (OD1)			.830			
The reporting discrepancy process is adequate. (OD2)			.788			
The response to order discrepancies is satisfactory. (OD3)			.686			
Contact employees can resolve product/service problems. (PCQ2)				.873		
Contact employees to try to understand my situation (PCQ1)				.766		
The service knowledge/experience of contact employees is sufficient. (PCQ3)				.719		
Order damage rarely occurs because of the transport mode. (OC2)					.826	
Order damage rarely occurs because of the transport carrier handling. (OC3)					.801	
The information is accurate, timely, and formatted to facilitate use. (OIS3)						.822
Services have an adequate ability to share both standardized and external information with customers. (OIS2)						.700
% of variance explained (79.13)		17.74	17.69	16.83	17.74	17.69
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.						.854
Bartlett's Test of Sphericity	Approx. Chi-Square					757.452
	df					78
	Sig.					.000
MSA						.757-901

Notes: Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

According to the result of factor analysis, as shown in Table 2, five factors are identified as independent variables: timeliness, order discrepancy, personal contact quality, order condition, and operational information sharing. The first factor explained 17.74%, the second explained 17.69%, and the third explained 16.82%. Next, the fourth item explained 14.07%, and the last factor was 12.83% with two items. The total variance explained in the model is 79.13%, which is considered good. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) is 0.854, which is adequate for conducting factor analysis. Other than that, Bartlett's Test of Sphericity is 757.452, which also shows an adequacy of the correlation matrix for factor analysis. MSA values in the range of 0.757 to 0.901 also show sampling adequacy for every factor. The first factor, timeliness, contained item loadings between 0.591 and 0.819, and the second factor, an order discrepancy, contained item loadings in the range of 0.686 to 0.830. Moreover, the third factor, personal contact quality, contained the item loadings between 0.719 and 0.873, and the fourth factor, the order condition, contained the item loadings between 0.801 and 0.826. The last factor, operational information sharing, contained the item loadings in the range of 0.700 to 0.822. Finally, a few items were discarded because they did not form the component according to the original conceptualization.

Table 3: Result of Factor Analysis for the Dependent Variable

		Component
		1
How Satisfied are you with the logistics service provider? (SAT3)		.891
Which words best describe your feelings toward a logistics service provider? (SAT2)		.838
What is your general impression of the logistics service provider? (SAT1)		.773
% of variance explained		69.75
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.657
Bartlett's Test of Sphericity	Approx. Chi-Square	95.196
	df	3
	Sig.	.000
MSA		.611-.746

Notes: Extraction Method: Principal Component Analysis.

According to the table above (Table 3), the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) is sufficient with a value of 0.657. Bartlett's Test of Sphericity result is 95.196, a sufficient correlation matrix for factor analysis. Furthermore, the MSA Value that ranged from 0.611 to 0.746 indicates that the samples are adequate for each item. As the table shows, the percentage of variance explained is 69.75%, which is adequate for the model. Based on the table, we can see the item loadings for the customer satisfaction factor from 0.773 to 0.891.

Table 4: Results of Reliability and Correlation Analyses

No	Variables	Mean	SD	1	2	3	4	5	6
1	Timeliness	3.97	.74	(.840)					
2	Order Discrepancy	3.99	.76	.567**	(.827)				
3	Personal Contact Quality	4.15	.67	.577**	.548**	(.843)			
4	Order Condition	4.15	.80	.492**	.510**	.380**	(.753)		
5	Operational Information Sharing	4.10	.73	.628**	.580**	.453**	.563**	(.751)	
6	Customer Satisfaction	4.06	.63	.552**	.630**	.548**	.621**	.617**	(.774)

As shown in Table 4, for Cronbach's Alpha coefficient, 0.9> a >0.8 is excellent internal consistency, while 0.8> a > 0.7 is acceptable. The table above shows three values of > 0.8, which is good, and three values of >0.7, which is acceptable internal consistency. Thus, it shows that the items measuring the intended variables are reliable to be used.

The correlation table above (Table 4) shows that all the mean and standard deviation values can be considered high. The lowest mean value of the variable is timeliness, with 3.97. From the previous table, Cronbach's Alpha of all variables exceeds 0.7, indicating that all the items and variables are significantly reliable. From the above table, the lowest correlation value between the independent and dependent variables is between order condition and customer satisfaction ($r=0.548$; $p<0.01$). For the highest correlation, it is between personal

contact quality and customer satisfaction (r=0.630; p<0.01).

Table 5: Result of Multiple Regression Analysis

Variables	Std Beta Coefficients
Timeliness	.031
Order Discrepancy	.234**
Personal Contact Quality	.195**
Order Condition	.296**
Operational Information Sharing	.207**
R	.764
R^2	.583
Adjusted R^2	.562
F value	27.722
Sig. F value	.000
Durbin Watson	2.062

Table 5 shows the results of a multiple regression analysis. Referring to the table, the R^2 value is 0.583, showing a 58.3% variance of the dependent variable, customer satisfaction, influenced by the independent variables: timeliness, order discrepancy, personal contact quality, order condition, and operational information sharing. Besides, based on the table, it can be determined that the model is significant (F=27.733, p< 0.01). Next, the Durbin Watson's value shows 2.062; thus, it is free from autocorrelation issues. The multiple regression analysis results show that four variables significantly influence customer satisfaction. The highest or the most significant independent variable is the ordering condition (β = 0.296, p < 0.01), followed by order discrepancy (β = 0.234, p < 0.01) and operational sharing information (β = 0.207, p < 0.01). Next, personal contact quality (β = 0.195, p < 0.01) and timeliness (β = 0.031, p > 0.05) have the lowest beta coefficient. This shows that order condition is the most significant variable influencing customer satisfaction. This differs from a previous Uvet (2020) study, which stated that timeliness and order conditions lead to two dimensions of physical distribution service quality.

Limitations

The first limitation of the study is that the questionnaires were given to the public and random persons. The study's population was huge because it is very general and not specific to those who only use courier services. The study will affect the findings because people with less experience using this courier service also answered the questionnaire. They want better information from their frequent experience using this service.

The second limitation of the study is that it focuses on courier services in Malaysia. It is common knowledge that many courier service companies in Malaysia provide delivery services. Each courier service company has its advantages and disadvantages. The study findings can also disadvantage general courier service companies because if a service courier company provides poor service and does not satisfy customers, the same effect will also harm other service courier companies.

The study's third limitation is time limitations in exploring previous research and collecting data. The time to study the research problem and collect data is limited. Appropriate use of time is essential to fulfill this research study before the deadline. The respondents were not interested and took a long time to answer the questionnaire form because the many questions caused the respondents to feel bored and only answered the questions with random answers. This study can affect the results of the study to obtain accurate data. The fourth limitation of the study is limited movement. It is common knowledge that the COVID-19 pandemic hit the country. Therefore, the study could not distribute the questionnaire to respondents and interview them more closely due to concerns over the health status of researchers and respondents who feared they could be affected by COVID-19.

Another possible limitation of this study is the data collection process. It is not easy to get cooperation from the selected respondents, and it takes time to meet the expected number of them for this research. Other than that, there is a lack of previous research studies. In collecting data, finding prior evidence of research related to courier service in Malaysia is quite challenging.

5. Recommendations and Implications

As for the recommendation for future researchers, it is proposed that the study must have its target respondents. To achieve more accurate findings, surveys need to be conducted by identifying who the respondents will be selected and having distinctive targets, such as focusing on online sellers like Shoppe or individuals who frequently use courier services at least 3-4 times a week. This is because the respondents, who consist of online merchants who always use the courier service, are more aware of the quality provided. Some respondents who only use the service courier service 1-2 times a month cannot answer questions and give an accurate picture of the quality provided by the service courier because they rarely use this service.

Time management is very important when conducting a study. Researchers must use time wisely, and each plan must have its target. For future researchers, the time required to obtain data and information from respondents must have its time frame so that each activity can run smoothly. The researcher must set the number of respondents required in a day to obtain the results without delay.

The researcher is also advised to focus on one service courier only to conduct this study. This is because if this study focuses on all the courier services available in Malaysia, the recorded results give inaccurate information and wrong pictures. For example, suppose a courier service such as JNT Express does not meet customer satisfaction requirements regarding goods guaranteed. In that case, it also harms other courier services such as POS LAJU, DHL, and so on because this study focuses on all courier service companies.

Lastly, it is expected that the researcher can use the interview method with the respondents to obtain additional information and more accurate data. If using the questionnaire, the respondent does not have other options to answer but must choose one of the given options, which reduces the richness of the data. In this matter, we can conclude that the data and information are not accurately recorded. Researchers must use the interview method to obtain more detailed data and information.

Implications of the Study

In a nutshell, this study has explained courier service in Malaysia from every perspective and has provided good knowledge to the researcher. This study has made researchers better understand the subject matter. One of the contributions that can be made is that customers can find out how courier services can affect customer satisfaction and what perspectives customers see when they use courier services. Customers will have different perspectives, so the researcher must analyze them carefully to ensure that each perspective can be considered and interpreted correctly. Researchers can also improve on this study, identify current issues or problems that customers may face in the future, and be sure whether the courier services selected in this study have improved customer satisfaction.

Furthermore, the contribution that can be made from this study is the contribution to the service courier companies in Malaysia. Any service courier company in Malaysia can take this study as one of the references so that these organizations can improve the services they deliver to their customers and increase customer satisfaction daily. In addition, any management of courier service companies in Malaysia can use this study to identify more about employees and organizations. Managers can create training to improve employee skills or hire mystery shoppers to understand customers' feelings about the service. From this, managers can build new strategies to resolve the complaints they receive from customers and find ways to ensure customers are satisfied with the services provided.

Finally, this study has contributed to the community as the community will take this matter seriously and provide honest feedback on the courier services industry. The public will benefit from the courier services industry if they understand how they can influence courier services because they have different service levels. The community sets the benchmark for the courier services industry to perform well and gain customer satisfaction. In this study, the community will also know other customers' issues and problems and continue doing business with such courier services.

Conclusion

The present study was conducted to investigate the factors that contribute to customer satisfaction using

courier services. It was found that three factors or variables highly influence customer satisfaction towards courier service: order discrepancy, order condition, and operational information sharing. It shows that a customer is concerned about the accuracy of the order delivered to them; the parcel's condition is good, not damaged, and all the information, such as tracking number status, is accurate. According to the result, order discrepancy is the most substantial variable influencing customer satisfaction. So, the courier service industry needs to focus on its operations, especially in the packing and delivering process, to prevent inaccurate orders because order discrepancy is the most influential variable influencing customer satisfaction with courier services. Although from this study, timeliness and personal contact quality are among the lower variables, it does not mean these variables are not critical for the courier service industry; some customers may have different perspectives. Thus, the organization must focus on all aspects to increase customer satisfaction.

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Towards Malaysia MADANI: Do Leadership Styles Influence Innovative Work Behavior? A Conceptual Framework for the Malaysian Public Sector

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Abstract: Transformational leadership, known for inspiring and motivating employees, has been positively linked to creativity and innovation, while ambidextrous leadership, which balances exploration and exploitation behaviors and supports both idea generation and implementation. This article provides a conceptual framework for the influence of transformational and ambidextrous leadership on innovative work behavior (IWB) among PTD officers as middle managers in Malaysian public service. The first proposition is transformational leadership positively influences innovative work behavior. The second proposition is ambidextrous leadership positively influences innovative work behavior. This model will be further tested using a quantitative research method, survey questionnaires and analyzed using SPSS and PLS-SEM. Accordingly, understanding of IWB in public sector settings is enhanced. The findings demonstrate the application of Social Cognitive Theory (SCT) and thus offer new theoretical insights and practical suggestions. Thus, this study highlights the importance of work behavior that drives innovation and positive values among employees in determining productivity and efficiency in the public sector, offering valuable insights for policymakers and practitioners.

Keywords: *Innovative work behavior*, *transformational leadership*, *ambidextrous leadership*, *middle managers*, *public service*

1. Introduction

In the context of rapid political, technological, and economic changes, innovation in the public sector is vital. The Organisation for Economic Co-operation and Development (OECD, 2017) emphasizes the role of public service employees as key drivers of innovation, highlighting the need to manage them as both facilitators and subjects of innovation. While innovation research in the public sector often spans individual, team, and organizational levels (Srirahayu et al., 2023; Ramadass et al., 2017), this study focuses on innovative work behavior at the individual level to gain deeper insights into how public service employees can drive innovation. Leadership is a critical predictor of innovative work behavior, with transformational leadership consistently linked to employee creativity (JPA, 2023; Grošelj et al., 2020; Awang et al., 2019). However, innovation's complexity requires diverse leadership behaviors, leading to recent interest in ambidextrous leadership as a relevant concept (Klonek et al., 2023; Rosing et al., 2011). The interplay between transformational and ambidextrous leadership on innovative work behavior among middle managers in public service explains why they are important assets to the organization.

Public sector organizations, operating within bureaucratic constraints, face immense pressure to innovate and address diverse societal challenges, including welfare, security, politics, economics, and environmental sustainability (MIGHT, 2020; Siregar et al., 2019) Which highlights the importance of continuous innovation. Innovation, defined as outcomes, processes, and mindsets, is crucial for maintaining a competitive edge, especially in unpredictable environments (Kahn, 2018). Public officials play a pivotal role in driving this innovation, and fostering an innovative culture among employees is essential for improving public sector effectiveness (Khaola & Musiiwa, 2021; Ramadass et al.,2017). Cultivating innovative, results-oriented culture among public service employees is the first step toward enhancing performance (Maqdliyan & Setiawan, 2023) and this is also highlighted by the OECD (OECD, 2017) about public sector effectiveness.

The case of the Malaysian public sector

Malaysia, in its pursuit of developed nation status, places significant emphasis on innovation capabilities as a global benchmark. Initiatives like the Eleventh and Twelfth Malaysia Plans (Kementerian Ekonomi, 2023), underscore the importance of reshaping public service to enhance efficiency, productivity, and innovation, ultimately aiming to propel Malaysia towards becoming a high-income, inclusive, and sustainable nation by 2030 (JPA, 2023; Ariffin et al., 2022). A robust leadership pipeline in the public sector is essential to navigate the complex challenges of contemporary governance, including transparency in policy-making, ethical conduct against corruption, and effective response to diverse socio-economic needs. The rapid pace of technological advancement and geopolitical uncertainties necessitate leaders who are not only value-driven but also transformational in their approach (MIGHT, 2020; WEF, 2017; Aziz et al.2015). Among critical factors for smooth collaboration between public sector agencies consists of transformational leadership, interdependence, creativity and innovation (JPA, 2023; Awang et al., 2019; Ramadass et al., 2017). In the recent introduction to MADANI's leadership (JPA, 2023), the 6 values of sustainability, prosperity, innovation and creativity, respect, trust and caring are aligned with the ability to engage in innovative work behavior (Sumual et al., 2023; Coun et al., 2021) and drive the successful transformation to reach organizational objectives (Ramakrishnan et al., 2024). By cultivating an environment that encourages transformational leadership and shared values, public sector organizations can enhance their ability to address pressing societal issues and achieve their organizational objectives, ultimately driving successful transformation in the public domain

However, despite these efforts, Malaysia's innovation performance, (which ranks 36th out of 132 countries) in the Global Innovation Index (GII) (WIPO, 2023) and recently in the process of developing the Malaysia Innovation Index (MOSTI, 2021) to improve the country's performance at the global level. Highlighting challenges in the nation's innovation capabilities. The Malaysian public sector also faces ongoing issues in service delivery, as evidenced by the increasing number of complaints recorded by the Public Complaints Bureau (PCB) from 2018 to 2022 (BPA, 2023; BPA, 2022). From 2018 to 2022, the Public Complaints Bureau (PCB) recorded 52,398 complaints, with the most common issues in 2022 being actions that did not meet complainants' requirements (9,086 cases), unsatisfactory service quality (1,443 cases), and failure of enforcement (1,600 cases). Other complaints included procedural non-compliance, delayed actions, lack of public amenities, unjust actions, and misconduct. The rising volume of complaints underscores the urgent need for the public sector to enhance its efficiency by fostering innovative behaviors among its employees (Liza Hashim, 2020).

These challenges underscore the need for a comprehensive investigation into Malaysia's public service innovation performance, focusing on enhancing innovative work behavior (IWB) among civil servants. Leadership plays a critical role (Ahmad et al; 2023) in this context, with transformational (Zahari et al., 2022) and ambidextrous leadership styles being particularly influential in shaping innovative behavior within public organizations (Coun et al., 2021). In this context, the public sector middle managers, especially those who served under the Administrative and Diplomatic Service or Perkhidmatan Tadbir dan Diplomatik (PTD) hold pivotal roles in driving innovation and achieving organizational objectives (Ramakrishnan et al., 2024; Ahmad et al., 2023; Mustafa et al., 2023).

Given Malaysia's ambition to become a high-income nation by 2030, the need to enhance innovation capabilities within the public sector is more pressing than ever. The challenges in service delivery, as evidenced by public delivery complaints (BPA, 2023) indicate that public sector employees must adopt innovative behaviors to meet the nation's development goals (Srirahayu et al., 2023). Leadership styles, particularly transformational and ambidextrous leadership, play a crucial role in cultivating an innovative climate that supports work behavior among PTD officers as public sector middle managers and future leaders.

Rationale of study

This study supports a systematic way of examining new areas such as work behavior as key factors of productivity and efficiency. The recognition of innovative work behavior (IWB) as a critical factor for enhancing organizational efficiency and competitiveness is gaining momentum, especially within the context of public service organizations. As mentioned, the success of these organizations heavily depends on their employees' ability to engage in IWB, despite the challenges posed by bureaucratic structures, budget constraints, and political issues (Afsar & Umrani, 2020; Hashim, 2021). In the Malaysian public sector, these challenges are

further compounded by the Global Innovation Index (GII), which underscores the urgent need for innovative approaches to improve service delivery and address public grievances (Singh & Hanafi, 2020). This study's background highlights the fragmented understanding of IWB, particularly in public organizations, making it difficult for these entities to foster a culture of innovation effectively (Bos-Nehles et al., 2017) to work behavior, other factors such as leadership styles could provide a deeper understanding of how these factors are related.

Therefore, this study seeks to bridge this gap by examining the relationship between transformational and ambidextrous leadership styles and their impact on the IWB of middle managers within the Malaysian public sector. Given the complex bureaucratic environment of the public sector, middle managers play a critical role in fostering innovation, yet their influence remains under-researched (Ancarani et al., 2021; Kempster & Gregory, 2017). Middle managers in the public sector here refer to PTD officers as middle managers due to their roles in policy design and implementation, management and government administration, and rigorous leadership assessments as part of leadership development (PPTD, 2022; INTAN, 2022). The findings of this study will contribute to a deeper understanding of how leadership styles can enhance the innovativeness among middle managers, ultimately improving service delivery and helping Malaysia achieve its national goals.

2. Literature Review

Innovative work behavior

Innovative Work Behavior (IWB) was first introduced by Farr and Ford (1990) to describe efforts by individuals to introduce new and valuable ideas, processes, and products in the workplace (Jose & Mampilly, 2016). De Jong & Den Hartog (2010) Further explain that IWB involves identifying problems and introducing beneficial ideas to create value, encompassing behaviors related to idea exploration, generation, support, and implementation (Janssen, 2000). Despite its frequent use in empirical research, there has been limited clarification of the concept itself. IWB generally refers to actions focused on generating, introducing, and/or applying novel and potentially advantageous ideas within an organization (AlEssa & Durugbo, 2021). IWB includes both extra-role and in-role behaviors, involving both radical and incremental innovation. While it shares similarities with workplace creativity and intrapreneurship, IWB is distinct in its singular focus on various forms of innovation (Sumual et al., 2023). Further research on the concepts of IWB will provide a better understanding of organizational innovation culture.

IWB is a complex process that requires generating ideas that are practical, proactive, and realistic (AlEssa & Durugbo, 2021). Its significance extends beyond organizational boundaries to impact national, global, and industrial levels, serving as a critical driver for companies to establish and sustain a competitive edge. In public sector organizations, innovation primarily targets process enhancement and service delivery improvement (de Vries, 2022; Masrek et al., 2017). Although innovation's importance is recognized in the public sector, there is a notable oversight in fostering innovative behavior among public sector employees (Vivona et al., 2022). This oversight is concerning, given the challenges public organizations face in maintaining effective citizen services and adapting to changes in public policy and priorities (Miao et al., 2018). Consequently, understanding and fostering IWB in the public sector is essential to improve service delivery and organizational efficiency.

The distinctions between IWB, creativity, and intrapreneurship are crucial for understanding their contributions to organizational innovation. Workplace creativity focuses on generating novel and useful ideas, primarily during the ideation phase, without necessarily considering their implementation. (Kremer et al., 2019) While creativity is a key component of IWB, IWB extends beyond idea creation to include their promotion and realization within the organization (Kassa, 2021). In contrast, intrapreneurship involves developing new ventures within an existing organization, characterized by entrepreneurial activities such as innovation, risk-taking, and proactive behavior (Khan et al., 2020). Unlike IWB, which can be part of everyday activities for all employees, intrapreneurship often involves specific roles or initiatives aimed at driving significant organizational change. Therefore, deeper investigations into the dimensions of intrapreneurship would explain values that are important to the organization.

However, public sector research on IWB has historically received less attention, despite its potential to enhance organizational efficiency and competitiveness (Bos-Nehles et al., 2017; Rafique et al., 2022). Studies have shown that factors such as leadership styles, organizational climate, and individual characteristics significantly

influence innovative behaviors, with transformational leadership being particularly effective in fostering innovation (Afsar & Umrani, 2020). In the Malaysian public sector, research has demonstrated that ethical leadership, organizational commitment, and self-efficacy significantly impact IWB (Hashim, 2021). Overall, promoting IWB in public service organizations is crucial for enhancing service delivery, improving efficiency, and better addressing public needs and challenges (Pham et al., 2024). Existing research on IWB has highlighted its importance in private organizations but has a huge potential for research in the public sector.

Transformational leadership and its relationship to Innovative Work Behavior

Transformational Leadership (TL) is a leadership style distinct from transactional leadership, focusing on inspiring employees toward a vision that surpasses their self-interests (Gao et al., 2020). Leaders who employ TL build strong relationships with their followers, which in turn fosters sustained organizational performance (Sobaih et al., 2022). This leadership style emphasizes aligning employees' aspirations with organizational goals, creating a shared vision, and nurturing a sense of belonging within the team (Al-Omari et al., 2019). Transformational leaders motivate their followers by providing inspiration, serving as role models, encouraging intellectual growth, and supporting the achievement of shared organizational visions (Suifan et al., 2018). As a result, TL has a profound impact on followers, promoting creativity, commitment, and the pursuit of significant initiatives within the organization (Bass & Riggio, 2006). TL development as both theory and style has provided a good context on leadership styles that are important for organizations.

TL boosts employee morale and aligns their efforts with organizational goals (Yusup & Maulani, 2023). By reducing resistance and encouraging positive behaviors, TL fosters confidence in employees' abilities to contribute to organizational success (Eroje et al., 2021). Furthermore, TL addresses fundamental psychological needs by promoting autonomy, competence, and interpersonal relationships in the workplace (Jensen & Bro, 2018). These factors create a conducive environment for innovation, enabling employees to focus on generating new ideas. Transformational leaders significantly influence organizational norms and values, thereby enhancing individual performance and encouraging innovative solutions (Li et al., 2019; Shafi et al., 2020). In essence, TL motivates employees by instilling a sense of purpose that transcends individual interests, creating a supportive environment that promotes organizational goals.

Transformational leaders also play a crucial role in cultivating a unique organizational culture that fosters IWB among employees (Nasirin & Asrinaa, 2020). They demonstrate problem-solving skills, motivational abilities, and effective performance evaluation, which are essential for nurturing IWB (Pradhan & Jena, 2019). As a result, empirical evidence consistently shows a positive correlation between TL and IWB (Li et al., 2019). Existing research has consistently demonstrated the positive impact of TL on employees' innovative behavior and overall organizational performance (Afsar et al., 2014; Thompson et al., 2021). Transformational leaders inspire creativity and innovation among employees, making TL one of the most effective leadership styles for fostering these behaviors (Thompson et al., 2021). Studies across various industries and cultural contexts have confirmed the significant relationship between TL and IWB, highlighting the crucial role of transformational leaders in creating environments that promote innovation (Abdul-Azeez et al., 2024; Li et al., 2019). These models can be further tested in public sector contexts.

Middle managers in the public sector

The research about middle managers started in the 1950s (Burns, 1957) and has evolved into middle-level experiences at work (Kim, 2005), the role of middle managers in the organization (Ancarani et al., 2020, Cooper et al., 2019; Kempster et al., 2017). In Malaysia, the role of PTD at the middle management level is important for organizational change and the development of future leaders (Ahmad et al; 2023; Samah, 2021) and their ability to innovate in their roles as think tanks to the government (Yusof, et al., 2016). While middle managers at large were perceived as vulnerable, ambiguous (2002) and received a lack of guidance from their superiors (Balogun and Johnson, 2005) recent studies have shown that this group becomes a significant asset to organizations (Cooper et al., 2019) and in the context of the public sector, middle managers as legitimacy expert and crucial during policy implementation as change agents (Ancarani et al., 2020). In common, this research highlights the importance of middle managers in hierarchical organizations because of their credibility, expertise, and the complex nature of being the middle.

However, the literature in this area remains scarce. The role and impact of middle managers need to be further explored (McGurk, 2009), to support the complexity of middle managers in the public sector. In Administrative and Diplomatic Service known as *Perkhidmatan Tadbir dan Diplomatik* (PTD), the majority of them are middle managers. In driving progress, the role of PTD includes public policy design and implementation, executive making decision-making, and advisory roles to the political masters (Ahmad et al; 2023; Samah, 2021). More research focusing on this particular group can assist in providing a better explanation of public service delivery and shift the negative mindset of PTD officers as the driver of productivity, creativity and innovation in realizing the country's aspiration towards an income high-income nation.

These studies suggest some gaps in understanding how these leadership styles influence innovation, particularly among middle managers who are key drivers of organizational change (De Jong & Hartog, 2007; Saeed et al., 2023). This paper can contribute to the existing body of knowledge by further exploring the relationship between TL and IWB, with a focus on middle managers in Malaysian public service organizations. Based on the arguments, the following proposition is formulated:
Proposition 1: Transformational leadership positively influences innovative work behavior

Ambidextrous leadership and its relationship to innovative work behavior
The concept of ambidextrous leadership (AL) for innovation, was introduced by (Rosing et al., 2011) was rooted in the broader theory of organizational ambidexterity. This theory emphasizes the importance of leaders' ability to switch between opening and closing behaviors to promote innovation effectively. Opening behaviors, such as encouraging experimentation and risk-taking, are essential for idea generation, while closing behaviors, such as enforcing rules and monitoring progress, are crucial for idea realization. Together, these opposing but complementary activities enable leaders to modulate employee actions, facilitating both exploration and exploitation within the organization (Gebert et al., 2010; Miron-spektor et al., 2011; Rosing et al., 2011). In this context, AL is defined as behaviors that promote positive organizational values.

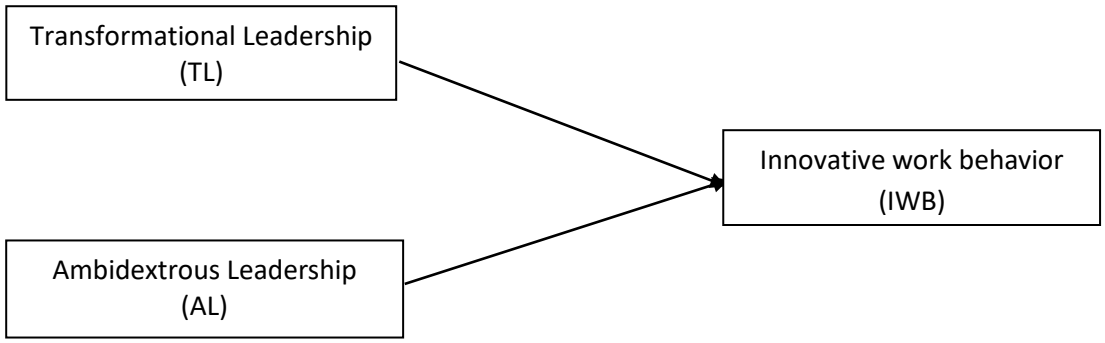
Ambidextrous leadership challenges the notion that innovation-promoting and monitoring behaviors are distinct by asserting that high levels of both are necessary for fostering innovation. Leaders who exhibit strong closing behaviors are crucial in transforming creative ideas into tangible innovations, a process that cannot occur without equally strong opening behaviors. (Alghamdi, 2018; Slåtten et al., 2023). Studies by Zacher and Wilden, (2014) highlights the diminished impact on innovation when leaders emphasize one behavior over the other, underscoring the need for a balanced approach in leadership to maximize innovative outcomes. Despite the growing recognition of ambidextrous leadership in innovation literature, its application in public administration remains underexplored (Backhaus & Vogel, 2022; Franken et al., 2020). Although some recent studies have examined ambidextrous leadership in public organizations, these often focus on outcomes other than innovation. (Dinesh Babu et al., 2024). There is a need for further research to explore the relationship between AL and innovative work behavior (IWB) within the public sector, particularly in light of theoretical advancements in leadership and innovation (Akıncı et al., 2022). More studies on the process of innovation can illustrate leadership as a practice.

Existing research on ambidextrous leadership consistently demonstrates its positive impact on innovative performance across various organizational settings. Studies by Zacher and Rosing, (2015) and Wang et al., (2021) have shown that high levels of both opening and closing behaviors are associated with superior innovative outcomes, often surpassing those achieved through transformational leadership alone. Furthermore, research in public sector contexts, such as Kousina and Voudouris (2023), confirms the significant influence of ambidextrous leadership on employee innovation, particularly when psychological ownership acts as a mediating factor. These findings underscore the importance of ambidextrous leadership as a key strategy for fostering innovation in diverse organizational environments (Saleh et al., 2023). Based on the arguments, the following proposition is formulated:
Proposition 2: Ambidextrous leadership positively influences innovative work behavior

Proposed Conceptual Framework
As mentioned earlier, most studies focus on the outcomes of innovation more than the innovation process itself. This study will focus on the key elements of IWB by integrating Social Cognitive Theory (SCT) with Transformational and Ambidextrous Leadership Theories in the conceptual framework. SCT explains how

individuals learn and innovate based on their perceptions of their environment, making it relevant for understanding employee behavior in organizations (Muchiri et. al., 2020). Transformational Leadership Theory, which emphasizes inspiring positive change and fostering a supportive, adaptive climate (Abdul Sahid et al., 2023), and Ambidextrous Leadership Theory, which focuses on balancing exploration and exploitation (Jabeen et al., 2023),. Together, these theories combined provide a comprehensive approach to understanding how leadership influences innovative work behavior. This framework aims to enhance organizational effectiveness and innovation, particularly within bureaucratic settings, by offering insights into leadership practices that drive continuous learning and operational efficiency. The proposed conceptual framework for this study is illustrated below:

Figure 1: Conceptual Research Framework (Developed by this research)



This study adopts a positivist paradigm and a deductive approach, grounded in Social Cognitive Theory (SCT), to explore the relationships between transformational leadership (TL), ambidextrous leadership (AL), and innovative work behavior (IWB). The research integrates TL and AL theories to hypothesize that both leadership styles positively and significantly influence IWB among middle managers in the public sector. By examining these relationships, the study aims to explain different levels of the innovation process from both individual and team perspectives. Additionally, the application of SCT using PTD officers as the study sample provides insights into how middle managers learn and innovate in their respective roles across ministries.

The framework is expected to show that transformational leadership fosters creativity and motivates middle managers to engage in innovative behaviors, while ambidextrous leadership helps them balance idea generation and execution. This combination should promote a dynamic and adaptable work environment, enhancing organizational effectiveness through continuous learning and problem-solving. The study's contribution lies in providing evidence of how these leadership practices can improve innovation in public service organizations, especially in bureaucratic contexts like Malaysia's public sector. Ultimately, this research could offer insights into enhancing public service delivery and achieving national development goals.

3. Methodology

The research design is structured around Saunders' Research Onion model, which provides a systematic approach to developing research methodology. This model covers various layers, including the research philosophy, approach, strategy, and data collection techniques, ensuring a comprehensive and methodical framework. This study will adopt a quantitative approach, utilizing questionnaires for data collection. Due to the absence of a comprehensive sampling frame, a non-random purposive sampling method will be employed. The sample will consist of PTD officers in Grades 48 and 52, serving in five selected ministries in Putrajaya. These ministries are chosen based on the Public Complaints Bureau Report, which highlights that they consistently received the highest number of complaints from 2019 to 2022. Guided by Krejcie and Morgan's (1970) sample size guideline, a sample size of 310 PTD officers in middle management from selected ministries is appropriate.

The respondents will be recruited online and through various networks. A survey will be developed using a survey tool such as Google Forms. The respondents will be invited to participate through several social media platforms such as WhatsApp and Facebook. Upon data, exploratory factor analysis (EFA) will be conducted

using SPSS to examine the dimensionality of items and proceed with the PLS-SEM for theory-testing theory testing. The survey strategy, chosen for its efficiency in gathering data from a large sample, aligns with the study's quantitative focus, facilitating empirical testing and objective analysis using SPSS and PLS-SEM.

4. Discussion

Relationship between transformational leadership and innovative work behavior

The literature highlights the significant impact of immediate leaders on employees' innovative work behavior (IWB), particularly within the public management field where innovation and leadership are closely studied. Transformational leadership, known for inspiring employees to exceed their self-interests and embrace a shared vision, is frequently associated with organizational transformation and increased IWB. (Abdul-Azeez et al., 2024). Studies have shown that transformational leaders can enhance employees' innovative potential by encouraging them to perceive problems differently and maximize their creative abilities. (Karimi et al., 2023). However, the relationship between transformational leadership and IWB has produced mixed results, with some research demonstrating a strong positive effect on creativity and innovation, while others have found minimal impact (Alshahrani et al., 2024; Saif et al., 2024)).

Despite the varied findings, transformational leadership plays a crucial role in fostering IWB by creating a culture that values innovation (Li, 2019; Saif et. al., 2024). Effective transformational leaders inspire employees to think critically, innovate, and tackle new challenges, thereby enhancing both individual and organizational effectiveness (H. Khan et al., 2020). They align organizational values with their own, motivate employees to pursue change and self-improvement, and promote analytical thinking, all of which contribute to heightened innovative behavior. (M. A. Khan et al., 2020). Moreover, transformational leaders involve employees in the entire innovation process, from idea generation to the realization of new products or services, emphasizing the importance of job autonomy and support from management in driving innovation (Karimi et. al., 2023; Khan et al., 2020). Therefore, this study anticipates finding support for Proposition 1.

Relationship between Ambidextrous leadership and innovative work behavior

This study utilizes the ambidextrous theory of leadership to examine how Ambidextrous Leadership (AL) influences Innovative Work Behavior (IWB). According to Rosing et al. (2011), AL involves leaders' ability to foster exploration through opening behaviors and facilitate exploitation through closing behaviors, both of which are essential for promoting innovation among employees. Leaders must continuously adapt their leadership styles to suit the dynamic needs of their teams, balancing the exploration of new ideas with the efficient implementation of those ideas to improve organizational effectiveness (Dinesh Babu et. al., 2024). IWB involves generating and implementing new ideas, products, or processes, which are crucial for organizational performance and innovation (De Jong & Den Hartog, 2007; Farr et al., 2003). The stages of AL, which include exploration and exploitation, require leaders to navigate these complex processes effectively (Alghamdi, 2018).

Ambidextrous leadership is recognized as a critical factor in driving organizational innovation, with scholars highlighting the need for leaders to balance opening and closing behaviors to foster innovative thinking and structured implementation (Rosing & Zacher, 2023). This leadership style is particularly effective in managing the nonlinear nature of innovation, where employees challenge the status quo and introduce new ideas (Mascareño et al., 2021). By adopting ambidextrous approaches, leaders can support their teams in both generating and implementing innovative ideas, thereby enhancing team learning and innovation (Duc et al., 2020). The ability to switch between leadership styles as needed is crucial for leaders to effectively foster innovation, enabling employees to engage in innovative work behavior and improve overall performance (Usman et al., 2020). Therefore, this study anticipates finding support for Proposition 2.

5. Conclusion

In conclusion, this study provides a conceptual examination of how transformational and ambidextrous leadership styles impact innovative work behavior among middle managers in Malaysian public service organizations. By focusing on these leadership styles and their interplay with innovative work behavior, the research aims to address a significant gap in the existing literature regarding leadership practices in the context of the Malaysian public sector. Theoretically, this study enhances our understanding of how diverse leadership

behaviors influence innovation, particularly within bureaucratic environments. Practically, the findings will offer valuable insights for top management and practitioners, enabling them to design and implement more effective leadership strategies that foster innovation and improve team performance, especially in heterogeneous teams. Furthermore, from a policy perspective, this research underscores the need for targeted leadership training programs, aligning with broader goals to enhance public sector efficiency and innovation. Overall, this study contributes to the advancement of leadership theory and provides actionable recommendations to support Malaysia's ambition of becoming a high-income, innovation-driven nation by 2030.

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Women's Empowerment through Islamic Microfinancing Initiatives for Microenterprises

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Abstract: Women's empowerment has increasingly been recognized as a critical component of sustainable economic development. Islamic microfinancing initiatives have emerged as a promising mechanism to support women's financial activities, particularly in Muslim-majority communities. Islamic microfinance is differentiated from conventional microfinance by emphasizing risk-sharing and commitment to social justice. This study explores the pivotal role of Islamic microfinancing initiatives in empowering women. The study adopts a conceptual framework that integrates various dimensions of empowerment such as economic, social, and psychological. By analyzing key factors such as loan amount, loan tenure, financial literacy support, support networks, age and sector of microenterprise, entrepreneurial experience, education level, and household income, this study aims to assess the impact of these initiatives on women's empowerment. Moreover, it is anticipated to offer valuable perspectives on the efficacy of Islamic microfinancing as a means to empower women. Furthermore, the findings are expected to guide policymakers and practitioners in designing and implementing more effective microfinancing programs that address the specific needs of women, thereby contributing to broader socio-economic progress.

Keywords: *Islamic Microfinance, Women Empowerment, Microenterprises, Logistic Regression, Malaysia*

1. Introduction and Background

The concept of microfinance gained prominence in the 1970s, primarily through the work of Nobel Laureate, Professor Muhammad Yunus and the Grameen Bank in Bangladesh. Microfinance was hailed as a revolutionary tool for poverty alleviation, enabling the poor especially women to access small loans for entrepreneurial activities. However, conventional microfinance has faced criticism because of offering higher interest rates, over-indebtedness among borrowers, and lack of financial literacy and business development (Bateman, 2010). In contrast, Islamic microfinance has gained prominence as a tool for economic development and poverty alleviation, particularly in Muslim-majority countries because of Its distinctive feature which is compliance with Shariah principles. This makes Islamic microfinancing an attractive alternative to conventional microfinance, especially for women who may face barriers to accessing traditional financial services. Islamic microfinance operates on principles such as interest-free loans (Qard Hasan), profit-sharing (Mudarabah), and joint ventures (Musharakah), which are designed to promote fairness and social justice while facilitating financial inclusion (Obaidullah & Khan, 2008; Demirgüç-Kunt et al., 2013).

In Malaysia, the evolution of Islamic microfinancing has been driven by government initiatives. Bank Negara Malaysia and other microfinancing providers have established specialized microfinancing schemes to cater to the needs of micro-entrepreneurs, especially women (Bank Negara Malaysia, 2023). These schemes are designed to offer flexible financing solutions that align with Islamic principles, making them an attractive alternative to conventional loans which conventional loans often impose high interest rates and rigid repayment terms (Musa & Abdullah, 2022). Despite these advancements, there are limited empirical on the impact of Islamic microfinancing on women entrepreneurs. Some studies suggest that Islamic microfinancing has the potential to enhance women's economic empowerment by providing access to capital, but there were arguments that without adequate financial literacy support and business development services, the impact may be minimal (Hassan & Osman, 2021).

Islamic microfinancing has played a significant role in fostering financial inclusion, particularly among underserved populations. Women's micro-enterprises are an important component of the Malaysian economy, especially in rural and semi-urban areas. These micro-enterprises are often characterized by low capital requirements, a small number of employees, and a focus on sectors such as retail, agriculture and services. Nevertheless, despite their potential these businesses face significant challenges including limited access to finance, lack of business skills, and cultural constraints that can impede their growth (Karim et al., 2021). Thus, by providing access to capital, Islamic microfinance institutions have empowered women to establish and grow their microenterprises contributing not only to their household income but also to broader economic development (Obaidullah & Khan, 2020). The potential of Islamic microfinance to empower women has been the subject of extensive research. Some studies have consistently shown that access to microfinance can significantly improve women's economic status by enabling them to start or expand their small businesses, thus, increasing their income and control over their household resources (Noreen, 2011; Zulfiqar & Tabasum, 2023). For instance, a study conducted in Pakistan revealed that women who received microfinancing were more likely to participate in household decision-making contribute to family welfare and lead to greater socio-economic empowerment (Khan et al., 2011). Similarly, research from Bangladesh has highlighted how Islamic microfinance programs have facilitated income generation and asset accumulation among rural women contributing to poverty reduction and enhanced self-reliance (Abdul-Rahman & Ahmad, 2010).

Despite these positive outcomes, the impact of Islamic microfinance on women's empowerment is not uniformly positive across all dimensions. While economic and social empowerment are frequently reported, challenges remain in fully realizing the potential of these programs. For example, research indicates that without complementary services such as education and rights awareness, microfinance alone may not lead to substantial improvements in women's autonomy or participation in public life (Zulfiqar & Tabasum, 2023). Additionally, the effectiveness of Islamic microfinance in promoting empowerment is often influenced by contextual factors, such as cultural norms and the legal environment, which can either facilitate or hinder women's access to financial services (Demirgüç-Kunt et al., 2018).

Given the complex interplay between financial services and empowerment, this study aims to explore the specific factors that influence the success of Islamic microfinance in empowering women in Malaysia. By analyzing variables such as loan size, tenure, financial literacy support, and the sector of the microenterprise, this research seeks to provide insights into how Islamic microfinance can be optimized to unlock the economic potential of women, thereby contributing to broader development goals. Women who gain access to financial resources often experience increased decision-making power within their households and communities, leading to greater gender equality (Cheston & Kuhn, 2002). Moreover, women's economic empowerment is closely linked to improvements in family health, education, and overall well-being, creating a ripple effect that benefits future generations. Therefore, understanding the impact of Islamic microfinance on women's empowerment requires a comprehensive analysis of not only the financial outcomes but also the social and cultural dimensions.

2. Literature Review

Women's empowerment remains a pivotal goal in global development initiatives, particularly within the realms of financial inclusion and poverty reduction. The concept of empowerment, as articulated by Kabeer (1999), involves the expansion of individuals' ability to make life choices in contexts where this ability was previously constrained. This multidimensional concept includes not only economic empowerment but also social, psychological, and political dimensions, reflecting a holistic approach to understanding how empowerment manifests in women's lives.

In recent years, microfinance has been widely promoted as a strategy for empowering women, especially in developing countries where traditional banking systems often fail to reach marginalized groups (Demirgüç-Kunt et al., 2018). However, conventional microfinance models have faced criticism for potentially exacerbating debt burdens among women due to high interest rates and inflexible repayment structures (D'espallier, Goedecke, Hudon, & Mersland, 2017). Islamic microfinance, which adheres to the principles of Shariah, offers an alternative that is more aligned with the ethical, social, and religious values of Muslim-majority societies (Rahman & Dean, 2013). This system's focus on risk-sharing, interest-free lending, and community welfare

positions it as a more culturally sensitive and potentially effective tool for promoting women's empowerment (Hassan & Aliyu, 2018).

Empowerment, as the dependent variable in this study, is an inherently complex and multifaceted construct. While economic empowerment—measured through income, savings, and business ownership—remains central, scholars argue that empowerment must also encompass social and psychological dimensions (Mosedale, 2014). Soc empowerment includes factors such as increased participation in household decision-making and community leadership roles, while psychological empowerment relates to self-confidence and a sense of agency (Yount, Cheong, & Miedema, 2018).

Islamic microfinance has the potential to contribute to these broader aspects of empowerment by not only providing financial resources but also by promoting values of equity, justice, and social responsibility (Abdul-Rahman & Nor, 2017). The holistic nature of Islamic finance, which integrates ethical considerations into economic transactions, may foster a more supportive environment for women's empowerment compared to conventional microfinance models (Obaidullah & Khan, 2008). However, empirical studies that examine these broader dimensions of empowerment within Islamic microfinance contexts are limited, highlighting a significant gap in the literature (Karim, Tarazi, & Reille, 2022).

This study explores several independent variables that are hypothesized to influence women's empowerment through Islamic microfinancing initiatives: loan amount, loan tenure, financial literacy support, age of the microenterprise, sector of business, entrepreneurial experience, education level, and household income. The size and duration of a loan are critical in determining the potential impact of microfinance on women's empowerment. Larger loans with longer tenures can provide the necessary capital and time for women to grow their businesses and achieve sustainable economic empowerment (Banerjee et al., 2015). However, the loan amount and tenure must align with the borrower's repayment capacity to avoid financial stress and potential disempowerment (Angelucci, Karlan, & Zinman, 2015).

Financial literacy plays a crucial role in empowering women to make informed financial decisions, effectively manage their resources, and navigate the complexities of microfinance products (Grohmann, 2018). In the context of Islamic microfinance, where financial products are based on Shariah principles, financial literacy support is even more critical. Women must understand these principles to fully benefit from Islamic financial services and avoid potential pitfalls (Goyal & Kumar, 2021).

The age of microenterprise and the sector in which it operates are also important factors in determining the impact of microfinance on empowerment. Older microenterprises may have more established revenue streams and thus a higher likelihood of success and empowerment (Amin, Hill, & Li, 2019). Meanwhile, the sector of business can influence the opportunities and challenges faced by women entrepreneurs, with some sectors offering greater growth potential and empowerment opportunities than others (Klapper & Parker, 2019).

Prior entrepreneurial experience and education level are often linked to higher levels of empowerment, as these factors can equip women with the skills and knowledge necessary to effectively run their businesses (Langevang, Namatovu, & Dawa, 2012). Women with higher education levels are more likely to understand financial products, manage their enterprises efficiently, and leverage opportunities for growth, leading to greater empowerment (Nawaz, 2021).

Household income is another critical factor, as it influences a woman's ability to take risks and invest in her business. Women from higher-income households may have more financial security, enabling them to invest in their enterprises without jeopardizing their family's welfare (Ashraf, Karlan, & Yin, 2010). Conversely, women from lower-income households may face greater financial pressures, which could limit their ability to invest in their businesses and fully benefit from microfinance programs (Swain & Wallentin, 2017).

The relationship between these independent variables and women's empowerment is multifaceted and context-dependent. For instance, larger loan amounts and longer tenures may lead to greater economic empowerment, but only if they are paired with appropriate financial literacy support and tailored to the specific needs and circumstances of the borrower (Banerjee et al., 2015). Financial literacy is crucial,

particularly in the context of Islamic microfinance, where understanding Shariah-compliant products is essential for making informed financial decisions (Goyal & Kumar, 2021).

Similarly, the sector of business and the age of the microenterprise can influence the effectiveness of microfinance in empowering women. Businesses in growth-oriented sectors or those with more established operations are more likely to benefit from microfinance and contribute to women's empowerment (Klapper & Parker, 2019). Entrepreneurial experience and education level also play significant roles, as these factors enhance a woman's ability to navigate the challenges of entrepreneurship and leverage the opportunities provided by microfinance (Langevang et al., 2012). In summary, the effectiveness of Islamic microfinance in empowering women is influenced by a complex interplay of factors. Understanding these relationships is crucial for designing microfinance programs that are truly effective in promoting women's empowerment in diverse contexts.

3. Research Methodology

To examine the influence of Islamic microfinancing programs on women's empowerment among Malaysian micro-entrepreneurs, this study employs a quantitative approach. A cross-sectional survey design will be employed to gather data from a specific group of Malaysian women entrepreneurs who have obtained Islamic microfinance. The study focuses on examining the impact of various elements associated with Islamic microfinancing, including loan size, loan tenure, and financial literacy support, on the empowerment of women. Specifically, the study investigates how different factors related to Islamic microfinancing influence the empowerment of women. The empowerment is measured through three empowerment indicators such as economic, social, and psychological using a composite empowerment index. Each dimension is scored, and a composite index is created to classify women as either empowered or not empowered (binary choice).

The target population for this study specifically is Malaysian women micro-entrepreneurs who have benefited from Islamic microfinance providers such as Amanah Ikhtiar Malaysia, Tekun or any other providers. Data is collected using a structured survey questionnaire administered online and in person. The survey consists of closed-ended questions and Likert scale items designed to assess variables related to Islamic microfinancing and women's empowerment. A stratified random sampling method is used to ensure representation across different business sectors (e.g., retail, agriculture, services). The Empowerment Index is computed based on responses to the empowerment indicators across economic, social, and psychological dimensions (refer to Table 2). Each dimension is scored, and a composite index is created to classify women as either empowered or not empowered. The data collected was analyzed using logistic regression to identify the impact of the independent variables on the likelihood of a participant being classified as empowered. The logistic regression model will be presented in the following form:

$$\log\left(\frac{P(Empowerment=1}{1-P\ (Empowerment=1)}\right) = \beta 0 + \beta 1 \text{ x Loan Amount} + \beta 2 \text{ x Loan Tenure} + \ldots\ldots\ldots + \beta n \text{ x Household Income}$$

Table 1 shows the definitions and measurement of variables used in the logistic regression model. The variables are measured as follows:

Table 1: Definitions and measurement of variables used in the logistic regression model

Variable name	Definitions/measurement
DEPENDENT VARIABLE	
Empowerment (DV)	Empowerment is categorized as binary where 1= empowered; 0 = not empowered using a threshold of 2.0 on the composite index. The Empowerment Index is calculated as a weighted composite score of economic, social, and psychological indicators.
INDEPENDENT VARIABLES	
Loan Amount	Amount (in Malaysian Ringgit) of Islamic microfinancing received by the owner of the microenterprise.
Loan Tenure	The duration of the loan repayment period is in months.
Financial Literacy Support	Financial literacy support is a vector of dummy variables where: 1 if the

Variable name	Definitions/measurement
	owner of the microenterprise received financial literacy training; 0=otherwise.
Support networks	Support networks are a vector of dummy variables where: 1 if the owner of microenterprise has access to business support networks; 0= otherwise.
Age of microenterprise	Number of years the business has been operating.
Sector of Business	The sector of the enterprise is a vector of dummy variables for different sectors (e.g., retail, agriculture, services)
Entrepreneurial Experience	A vector of dummy variables of experience where 1 if the owner of the microenterprise has work or business experience before running the business and 0 otherwise.
Education Level	Highest level of formal education attained (0 = No Education; 1 = Primary; 2 = Secondary; 3 = Tertiary).
Household income	Household income in Malaysia Ringgit (monthly).

Multicollinearity diagnostics will also be performed to ensure that independent variables do not exhibit high correlation, which could distort the model estimates.

Table 2: Empowerment Index Indicators and their respective categories (economic, social, and psychological)

Category	Indicator	Type of Measure	Description
Economic	Business Growth	Business growth is a vector of dummy variables where: 1 for Yes; 0=No.	Has the participant's business grown in terms of profits?
	Income Increase	Income increase is a vector of dummy variables where: 1 for Yes; 0=No.	Has the participant's personal or household income increased?
	Asset Ownership	Asset ownership is a vector of dummy variables where: 1 for Yes; 0=No.	Does the participant own business-related assets independently?
	Financial Independence	Financial independence is a vector of dummy variables where: 1 for Yes; 0=No.	Does the participant make financial decisions independently?
	Job Creation	Job creation is a vector of dummy variables where: 1 for Yes; 0=No.	Has the participant created jobs as a result of her business?
Social	Decision-Making Power	Decision-making power is a vector of dummy variables where: 1 for Yes; 0=No.	Does the participant have decision-making power in her household or business?
	Mobility	Mobility is a vector of dummy variables where: 1 for Yes; 0=No.	Does the participant have freedom of movement and participation in business activities?
	Control Over Resources	Control over resources is a vector of dummy variables where: 1 for Yes; 0=No.	Does the participant have control over business resources?
	Support Network	A support network is a vector of dummy variables where: 1 for Yes; 0=No.	Does the participant have access to a business or social support network?
Psychological	Self-Efficacy	Likert Scale (1-5)	How confident is the participant in her ability to succeed in business?
	Self-Confidence	Likert Scale (1-5)	How confident is the participant in managing business and life challenges?

4. Conclusion

Islamic microfinancing presents a unique and culturally sensitive approach to promoting women's empowerment, particularly in Muslim-majority societies. Grounded in the ethical principles of Shariah, it offers an alternative to conventional microfinance by focusing on risk-sharing, interest-free lending, and the broader goal of social welfare. This framework not only aligns with religious values but also holds the potential to foster a more inclusive and just financial system that supports the holistic empowerment of women.

However, the path to empowerment through Islamic microfinance is complex and influenced by a myriad of factors. While economic empowerment is a significant outcome, true empowerment extends beyond financial independence to include social, psychological, and political dimensions. Factors such as loan amount, loan tenure, financial literacy support, the age of the microenterprise, the sector of business, entrepreneurial experience, education level, and household income all play critical roles in determining the effectiveness of microfinance initiatives in empowering women.

The relationship between these variables is intricate and context-dependent, underscoring the need for a nuanced approach to designing and implementing microfinance programs. To truly empower women, Islamic microfinance must be accompanied by comprehensive support systems, including financial literacy training and tailored services that consider the unique challenges and opportunities faced by women in different sectors and stages of business development.

As the field of Islamic microfinance continues to evolve, future research must address the gaps identified in this study, particularly the need for multidimensional assessments of empowerment. By deepening our understanding of how Islamic microfinance influences not just economic outcomes but also social and psychological empowerment, we can develop more effective strategies that contribute to the sustainable development and well-being of women worldwide.

In conclusion, while Islamic microfinance holds great promise as a tool for women's empowerment, its success depends on a holistic and well-integrated approach that considers the diverse needs and contexts of women entrepreneurs. By focusing on both the ethical principles of Islam and the practical realities of women's lives, Islamic microfinance can play a pivotal role in advancing gender equality and fostering inclusive growth in the communities it serves.

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Job-Hopping Intention Among Lecturers in Private Education Institutions

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Abstract: The practice of frequently changing jobs known as job-hopping is increasingly prevalent across industries, including academia in search of better opportunities or personal growth. Due to this situation, it is more challenging for educational institutions, particularly in the private education sector to retain highly skilled lecturers in the organization. This study aims to identify the relationship between job-hopping intention among lecturers in private educational institutions and the factors that are job satisfaction, job motivation, psychological contract, and person-environment fit. Data was collected from 260 respondents across all KPTM branches through questionnaires and analyzed using SPSS version 29. The findings show that strong psychological contract negatively influences job-hopping. On the other hand, job satisfaction, job motivation, and person-environment fit show no significant influence. This study not only provides a deeper understanding of job-hopping motivation but also gives valuable insight for policymakers to develop strategies and modules that enhance job satisfaction and retention among lecturers, especially in private education institutions.

Keywords: *Job-hopping Intention, Job Satisfaction, Job Motivation, Psychological Contract*

1. Introduction and Background

Employees stand out as vital assets within any organization, carrying the potential to shape the fate of the organization positively or negatively. Protecting their allegiance to the organization is vital, concurrently averting their inclination to actively explore alternative job prospects or opportunities elsewhere (Murali, Poddar & Seema, 2017). The standard models of prolonged employment have been disturbed by the emergence of job-hopping, characterized by frequent changes in employment. This trend, facilitated by the widespread availability of online job platforms, introduces fresh challenges for human resource management (Wider et al., 2023). The act of frequently changing jobs not only leads to the disappearance of valuable talent but also forces significant expenses on businesses for recruiting and training new personnel (Wider et al., 2023). Ghazali and Roslan (2020) coined the phrase 'job-hopping culture,' referring to a collective attitude within an organization that promotes individuals changing jobs or shifting to different organizations, thereby socially normalizing such conduct. In general, employers tend to perceive job-hopping in a negative light, as they highly value individual traits such as loyalty and long-term commitment. This has posed potential difficulties in the effective management of talent within many business organizations (Pandey, 2019).

Nowadays, frequent job-hopping has emerged as a prevalent and unavoidable issue, causing concern for both lecturers and employers in the private education sector (Selvanathan, 2019). Hence, retaining top talent among lecturers poses a considerable challenge (Bolden-Barrett, 2019). According to Feng and Angeline (2010), 2 interviews with parents, music students, teachers, and principals indicated that music schools commonly face a significant level of teacher turnover and frequent job-hopping. Currently, the widespread occurrence of job-hopping in the nation is causing significant worry, particularly within academic institutions. Numerous researchers and HR consultants have recognized the crucial role of workforce stability in ensuring the seamless functioning of any organization (Dhanapal et al., 2013). According to data from the United States Bureau of Labor Statistics, young lecturers aged between 20 and 34 typically have an average tenure of only 2 to 3 years (Selvanathan et al., 2019).

According to Selvanathan et al. (2019), the average tenure of an American lecturer in the same position is 4.6 years. According to data from the United States Bureau of Labor Statistics, young lecturers aged between 20 and 34 typically have an average tenure of only 2 to 3 years. Throughout the years, industries have grappled with turnover rates as a primary challenge. Drawing from past research conducted in the private sector,

numerous inquiries have arisen about the reasons behind employee turnover within organizations. The practice of job-hopping is not a recent phenomenon, but its prevalence is on the rise, primarily attributable to a constrained labor market experienced over the past several years. This occurred despite an inflation spike that adversely affected the real earnings of many individuals. Conversely, among those who stayed with the same employer, less than half of 47% encountered an augmentation in real earnings (Kochhar et al., 2022).

Job satisfaction is defined as a favorable emotion experienced by an individual in response to the circumstances of his workplace (Robbins & Judge, 2018). Previous studies by Ashton (2018) and Kashyap & Rangnekar (2016) demonstrate that work satisfaction influences employee turnover purpose. The job-hopping trend, which is anticipated to continue to grow and potentially weaken many private economic sectors, can be attributed to a variety of causes (Hom et al., 2017). Thus, job satisfaction can reflect several layers of emotions and employee situations, including their opinion of the organization's or company's attitude, which can influence employee conduct at work (Munir & Rahman, 2016). Moreover, job motivation that is related to job attitude is also found as the determinant of job-hopping intention as it impacts employees' desire to switch jobs to other organizations (Rivers, 2018). Job motivation is the emotional commitment an employee has to his or her work to complete it (Badubi, 2017). It is also considered that job motivation is how employees make decisions to achieve particular goals that will have a favorable impact on their productivity inside the firm (Kinasih, 2020). In addition, the psychological contract was also another factor that influenced job-hopping. Based on the 2013 SHRM report, The Society for Human Resource Management endorsed the opposition of employers by citing the trend of retiring Baby Boomers and the difficulty in attracting and retaining competent workers in recent years. According to Yuen (2016), found that employees aren't loyal to their companies because they believe "the psychological contract is dead." This means they do not believe they must remain loyal and raise within one company. Furthermore, Rivers (2018) highlighted that if an employee's psychological contract is broken, they will be less committed to the organization. Likewise, person-environment fit was very crucial for someone to stay longer in their workplace. Person-environment fit signified that a person was compatible with his or her environment because his or her characteristics were comparable to those of the other people in the environment (Ahmad, 2017). Those who adapt to the organization's culture, environment, and people are less likely to switch professions as they experience person-organization fit that makes them feel motivated and at ease in the workplace (Siew et. al., 2023).

Therefore, this study aims to investigate the relationship between job satisfaction, job motivation, psychological contract, and person-environment fit toward job-hopping intention among lecturers in private education institutions.

2. Literature Review

Job-Hopping Intention: Job-hopping is a behavior in which employees tend to jump from one occupation to another in a short period to enhance their possibilities for professional development and personal advancement (Khatri et al., 2001). Although it provides benefits for employees to accumulate and expand their skill sets and capabilities by gaining experience in various positions, employees who regularly transfer employment are viewed as disloyal, reckless and uncommitted to the organization (Siew et al., 2021). Job-hopping become a major concern of organizations since it would cause a shortage of talent and disruption in human management functions such as selection, training and development, human resource planning and the achievement of organizational objectives might be jeopardized (Lee et al., 2019).

According to Pranaya (2014), employees who frequently change jobs within two years voluntarily are considered job-hoppers. A study conducted by Sullivan & Baruch (2009) found that young people are more likely to engage in job-hopping as they are interested in gaining a diverse range of working experiences in a variety of industries to broaden their skill set and expertise for career advancement. This condition is explained by the hobo syndrome which refers to an employee’s tendency to frequently change employers (Ghazali et al., 2018). It is comparable to job hopping, where individuals exhibiting hobo syndrome prioritize switching companies rather than seeking new roles within their current organization (Rivers, 2018). The primary motivations for job-hopping include the pursuit of a perfect fit between individual and organizational culture, professional progression, and work-life balance (Tetteh et al., 2021; Pranaya, 2014).

There are two reasons for job-hopping behaviors. Some employees engage in frequent job changes due to some irrational reason. However, employees mostly engage in job-hopping for better career development. The influence of social support and shared beliefs among co-workers encourages individual employees to search for better jobs and career opportunities elsewhere (Akmal et al., 2017). Job-hopping is viewed as a better way for career advancement which will lead to better pay and benefits as well as fulfilling one's personal and professional goals (Yuen, 2016).

Given the varied interpretations of job-hopping, this study focuses specifically on job-hopping intention as it is defined as the willingness of employees to voluntarily leave their current organization for another organization. Intention is a precursor to behavior thus, it is the most important indicator of whether an individual will decide to engage in a particular behavior (Kinasih, 2020). The subsequent sections will examine four key factors influencing job-hopping intention among lecturers in private education institutions.

Job Satisfaction: Robbins & Judge (2018) define job satisfaction as a positive feeling about one's employment that results from an appraisal of own features of the job and the company. It is a measurement of how well the organization provides things that the employee considers important to achieve high productivity and develop an effective emotional response to various aspects of the job (Bangun et al. 2019). Job satisfaction is related to the feeling of contentment with one's work which is influenced by an individual's self-evaluation of their current position and environment (Rothmann & Coetzer, 2002). Studies also found that it is a crucial indicator that affects employees' moods, attitudes and happiness toward their employment in general and acts as a foundation of organizational commitment (Locke, 1976; Sempane et al.,2002).

A high level of job satisfaction hurts withdrawal cognitions which include thoughts of quitting, intent to search for alternatives, and decisions to quit. In contrast, Employees who have persistently low levels of job satisfaction may be more likely to engage in job-hopping behavior and to find new employment (Huang & Zhang, 2013). While job satisfaction itself is a complex factor, it is possible to measure employee job satisfaction by their perceptions and expectations. As a result of this, numerous researchers have stated that job satisfaction has an influence on the employee's productivity and performance at work, as well as absenteeism, retention, and staff turnover (Sageer et al., 2012). Several factors influence employees' level of satisfaction which include the work itself, salary, supervision, relationship with co-workers and promotion opportunities (Robbins & Judge 2018).

Research consistently highlights the crucial role of job satisfaction on employee retention and job-hopping intention. Rivers (2018) found a strong correlation between job satisfaction and factors like salary, work environment, interpersonal relationships and job roles. There is evidence that job satisfaction regularly and significantly correlates with employee retention or job-hopping intention. It was discovered that low job satisfaction is a factor in quitting intentions. Low job satisfaction has negative effects on employee motivation, absenteeism, productivity, and intrinsic work values. In addition, a study conducted by Huang & Zhang (2013) found a link between low job satisfaction and increased job-hopping intention. Employees experiencing chronic job satisfaction are more likely to engage in job-hopping intention and potentially to locate new employment. Essentially, job satisfaction reflects an employee's overall positive emotional state derived from their work experiences, influencing their commitment, engagement, and ultimately their decision to stay with or leave an organization. Hence, it is hypothesized that:
H1: There is a relationship between job satisfaction and job-hopping intention among lecturers in private education institutions.

Job Motivation: Job motivation is defined as the emotional attachment an employee has to his or her work to complete it (Badubi, 2017). Job motivation acts as the driving force behind an employee's commitment and effort towards their work. With an appropriate incentive, it can significantly enhance employee performance (Jalagat, 2016). According to Kinasih (2020), an employee with high job motivation will make conscious decisions to achieve specific goals that will benefit both themselves and their organization. Moreover, job satisfaction was found to have a significant impact on job satisfaction. While job motivation derives from future expectations employees have towards their job, job satisfaction or job happiness on the other hand arises from past experiences and events (Sahito & Vaisanen, 2017).

Job motivation has a significant impact on employee performance and intention to leave. Thus, it is important to understand the factors that lead to employees' job motivation. Millennials, in particular, prefer meaningful jobs, competitive compensation packages, a positive working environment, opportunities for growth professionally and flexible work arrangements. Rivers (2018) suggests that job motivation directly influences employees' decision to stay or leave the organization. Employees' productivity and performance will significantly decline when their level of job motivation is reduced. Therefore, the hypothesis is formulated as follows:
H2: There is a relationship between job motivation and job-hopping intention among lecturers in private education institutions.

Psychological Contract: Psychological contracts explain the employer-employee expectation in their employment relationship in which employees attempt to fulfill their duties in exchange for the organization meeting their wants (Kinasih, 2020). The Social Exchange Theory supports the psychological contract, which suggests that workers and firms engage in exchanges in which one side reciprocates the contributions of the other (Blau, 1964). Psychological contract theory is a two-dimensional (relational and transactional) paradigm that encompasses the perceived promises made by the employer (Rousseau, 2011). The relational dimension relates to an emotional component that focuses on mutual trust and loyalty. This highlights the importance for organizations to cultivate mutually beneficial, long-term relationships with their employees. By providing opportunities for professional growth, training, and job security, organizations can foster loyalty and commitment among their employees (Ma'amor et al., 2014). On the other hand, the transactional dimension is related more to monetizable and materialistic elements including pay and working conditions. Both components of the psychological contract hypothesis are essential because they link employee expectations to job satisfaction, hence lowering potential turnover (Bal and Kooij, 2011; Rousseau, 2011).

Understanding psychological contracts will benefit organizations to attract and retain employees. Gaining knowledge of employees' varying expectations regarding contributions and rewards can be advantageous to an organization's ability to motivate its employees (Low et al., 2016). Employees expect career-related benefits from the organization such as competitive compensation, as well as career and development opportunities. Fulfilling this expectation enables an organization to ensure employees' commitment, performance, satisfaction and intention to remain as organization members thus, reducing the job-hopping intention (Rivers, 2018). This is in line with the norm of reciprocity, when an organization does not fulfill its promises and responsibilities, employees experience a psychological contract breach thus leading to disappointment, frustration and rage. In this situation, employees will modify their contributions to the organization, which might lead to a diminishing of job performance and increase the potential of job-hopping intention (Gouldner, 1960; Maia & Bastos, 2015; Lub et al., 2016). Moreover, a study conducted among academicians in Turkish universities revealed that psychological contract breaches perceived by academicians will increase the feeling of anger and betrayal then further lead to a reduced sense of organizational attachment (Buyukyilmaz, & Cakmak, 2013). Therefore, the hypothesis is formulated as follows:
H3: There is a relationship between psychological contracts and job-hopping intention among lecturers in private education institutions.

Person-environment Fit: Person-environment fit exists when the characteristics of the employee and the work environment are well matched (Krishnan et al., 2014). Person-environment fit refers to employees who seek a match between their characteristics and those of their workplace (Vianen, 2018). Employees tend to work with organizations that can match their talents, hobbies, and personal values, in addition to business culture and procedures (Niki, 2017).

Two perspectives describe person-environment fit: supplementary fit and complimentary fit. The complementary fit means that the term fit focuses on the similarities between the individuals and the members of the organization, whereas complementary fit means that the individuals are contributing their skills to fill the gaps in the organization; it can also be referred to as person-job fit (Kerse 2018). Person-environment compatibility includes numerous dimensions that are typically addressed about values and objectives. Because values are seen as the foundation of an individual's identity and commitment, they frequently play a significant influence in determining attitudes, judgments, or even behavior, making them the most influential factor in defining person-organizational compatibility. By adding the organization's value, it is stated that there will be

a higher level of person-environment fit in the organization, thereby extending the value of individuals to the organization and demonstrating a similar value orientation between the two (Abdalla et al., 2018).

According to Ghazali and Roslan (2020), the work environment is one of the factors that influences employees' job-hopping intention. A stressful working environment, task overload, hostile superiors, and extended working hours may increase the potential of job-hopping intention. However, when there is a good fit between employee's interests and the role they play within the organization, the employee is more likely to remain in their current position. On the other hand, if their interests and their profession do not coincide, there is a greater possibility that the employee may leave the organization in search of work that better suits their interests. This study shows that person-environment fit can help improve organizational performance. This is because employees who experience person-environment fit tend to feel more satisfied and reduce burnout and anxiety which in the end reduces the potential of job-hopping intention. Thus, the hypothesis is presented as follows.

H4: There is a relationship between person-environment fit and job-hopping intention among lecturers in private education institutions.

3. Research Methodology

A correlation study was conducted to identify the influence of job satisfaction, job motivation, psychological contract and person-environment fit toward job-hopping intention among lecturers in private education institutions. The population of this study consists of lecturers from Kolej Poly-Tech MARA (KPTM) with a total number of 550 lecturers. The questionnaire survey was used as the instrument for data collection utilizing the 5-point Likert Scale for dependent variable (DV) and independent variable (IV) sections. Questionnaire items for Job Satisfaction, Job motivation, Psychological Contract, Person-environment Fit and Job-hopping Intention were adopted from Kinasih (2020). Non-probably sampling was used in which a total of 400 questionnaires were distributed to lectures at KPTM collage from 8 branches through email. With a 65% return rate, a total of 260 questionnaires were analyzed in SPSS version 29. The analyses carried out for this research are descriptive demographic analysis, correlation and regression analysis.

4. Results

The outcome of the data analysis is presented in this section. This includes the discussion of the demographic profile of respondents, as well as the results for reliability, correlation and regression analysis.

Profile of Respondents: Table 1 displays a summary of the demographic profile of respondents. Frequency analysis was used to examine respondent's demographic characteristics which include gender, age, education level, length of service, and monthly income level. Based on the analysis, the majority of the respondents were female which represented 51.9% (n=135), followed by males (48.1%, n=215). Most of the respondents were between 26-35 years old (44.2%), while 87 respondents (33.5%) were between 36-41 years old. Meanwhile, the lowest frequency of age group was 58 respondents (22.3%) between 20-25 years old. In terms of the highest education level, 134 respondents hold a bachelor's degree which represents 51.5% followed by a master's degree (n=94, 36.2%) and a Doctor of Philosophy (n=32, 12.3%). A total of 97 respondents (37.3%) have been working in KPTM for 4-6 years. Another 82 of the respondents (31.5%) have been working for 7 years and above, while 74 respondents (28.5%) have working experience ranging from 1-3 years. The remaining 7 respondents (2.7%) just recently joined this organization which is less than 1 year old. The highest frequency of income level was income level between RM2,001-RM3,000 which was represented by 87 respondents (33.5%). This if followed respectively by income level range between RM3,001- RM5,000 (n=76, 29.2%), RM5,001-RM7,000 (n=67, 25.8%) and above RM7,001 (n=30, 11.5%).

Table 1: Demographic Profile

VARIABLE	FREQUENCY	PERCENTAGE
GENDER		
Males	125	48.1%
Females	135	51.9%
Total	**260**	**100%**

AGE		
20-25	58	22.3%
26-35	115	44.2%
36-41	87	33.5%
Total	**260**	**100%**
EDUCATION LEVEL		
Bachelor's Degree	134	51.5%
Master's Degree	94	36.2%
Doctor of Philosophy	32	12.3%
Total	**260**	**100%**
LENGTH OF SERVICE		
Less than 1 year	7	2.7%
1-3 years	74	28.5%
4-6 years	97	37.3%
7 years and above	82	31.5%
Total	**260**	**100%**
MONTHLY INCOME LEVEL		
RM2,001 - RM3,000	87	33.5%
RM3,001 - RM5,000	76	29.2%
RM5,001 - RM7,000	67	25.8%
RM7,001 above	30	11.5%
Total	**260**	**100%**

Reliability Analysis: Reliability analysis was conducted to measure the consistency of the items used in this study. According to Malhotra (2004), Cronbach's Alpha value that is higher than 0.6 indicates a strong association. Based on Table 2, it is shown that Cronbach's Alpha value for job-hopping intention is 0.889 indicating the items used to measure this variable are strongly reliable. Meanwhile, the alpha values for other variables also showed a strong reliability with the values of 0.797 (job satisfaction), and 0.782 (job motivation). 0.830 (psychological contract) and 0.791 (person-job fit).

Table 2: Result of Correlation and Reliability Analysis

No	Variables	Mean	SD	1	2	3	4	5
1.	Job Satisfaction	4.086	0.545	(0.797)				
2.	Job Motivation	4.247	0.481	0.728**	(0.782)			
3.	Psychological Contract	4.132	0.641	0.813**	0.717**	(0.830)		
4.	Person-environment Fit	4.572	0.511	0.637**	0.655**	0.711**	(0.791)	
5.	Job-hopping Intention	2.267	0.813	-0.482**	-0.448**	-0.512**	-0.452**	(0.889)

Notes: **significant at the 0.01 level (2-tailed); Cronbach's alpha values are shown in the parentheses.

Correlation Analysis: Referring to Table 2, the result of the correlation analysis indicated a significant negative association between job-hopping intention and job satisfaction. The result showed a moderate negative association with r=-0.482 (p<0.01). Similarly, there is also a significant negative association between job-hopping intention and job motivation that indicated with moderate negative association between the variables (r=-0.488, p<0.01). Furthermore, the association between job-hopping intention and psychological contract also indicates a significant relationship with the r value is -0.512 (p<0.01) which shows a moderate negative association. The result also revealed a significant association between job-hopping intention and person-environment fit with the value of r=-0.452 (p<0.01) indicating a moderate and negative association between the variables.

Table 3: Model Summary of Regression Analysis

Summary		ANOVA	
R^2	Adjusted R^2	F	Sig.
0.290[a]	0.279	26.021	.001[b]

Regression Analysis: Regression analysis was conducted to identify the relationship between independent variables (job satisfaction, job motivation, psychological contract and person-environment fit) and dependent variables (job-hopping intention). Based on Table 3, the R^2 value (0.290) indicated that 29% of the variance in the independent variables attributed to the dependent variable while the remaining 71% of the variance attributed to the dependent variable came from other factors that were not included in this study.

Table 4: Regression Coefficient Analysis

Variables	Standardized Coefficients Beta
Job Satisfaction	-.132
Job Motivation	-.087
Psychological Contract	-.245*
Person-environment Fit	-.137

Dependent variable: Job-hopping Intention

The regression result in Table 4 shows that only one variable namely psychological contract showed a significant relationship with job-hopping intention with the value of β=-.245 with $p<0.05$. This finding indicates that psychological contract has a significant negative influence on job-hopping intention. On the other hand, job satisfaction, job motivation and person-environment fit do not influence job-hopping intention.

Discussion: The findings from this study revealed that only H3 was accepted, while H1, H2 and H4 were rejected. Only psychological contract has a significant negative influence on job hopping intention among lecturers at KPTM. It is indicated that the stronger the psychological contract experience by lecturers, the lower the tendency for them to have job-hopping intentions. When lecturers experience a fulfillment of their expectations within their psychological contract, it fosters loyalty and encourages them to remain committed to the organization. This is in line with Hassan et al., (2017) who emphasize that psychological contracts are closely connected to the trustworthiness of the organization. Once an employee establishes a psychological contract, they are likely to experience a higher sense of belonging or ownership about their job, consequently enhancing commitment. Additionally, Hammouri et al. (2022) argue that universities that fulfill their obligation promise to their academic employees will experience lower turnover in return.

5. Managerial Implications and Recommendations

This study expands our understanding of how factors like job satisfaction, job motivation, psychological contract and person-environment fit influence job-hopping intention among lecturers at KPTM. This study provides evidence that increased psychological contracts will reduce job-hopping intention thus helping organizations in retaining their talents. Thus, for an organization to reduce potential job-hopping intention, understanding factors that influence psychological contracts is crucial as it can be used as guidelines to revisit and develop suitable organization policies, culture, compensation packages and job-related environment that will increase employees' productivity, commitment and loyalty to the organization.

Conclusion: As we have seen, it is a common struggle for organizations nowadays to retain their talents due to various factors including industry competition and increased employees' expectations. This study suggested that psychological contract plays an important role in influencing job-hopping intention. As the result indicates a negative relationship between these variables, thus it implies the need for organizations to focus on ways to fulfill employees' expectations to ensure their commitment and loyalty to the organization. This study contributed to a better understanding of the condition under which psychological contracts significantly influence employees' job-hopping intention.

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The Role of Government Health Expenditure in Driving Economic Growth: Evidence from OECD Countries

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Abstract: This study examines the influence of government health expenditure and life expectancy on economic growth. The study makes use of panel data analysis and utilizes data from the OECD nations between 2000 and 2021. The study applies panel data analysis using POLS, FEM and REM models and dynamic GMM models. The study also gauges the moderating role of life expectancy on the relationship between government health expenditure and economic growth. The results indicate that government expenditure on health hurts economic growth. A detrimental relationship between life expectancy and economic growth indicates that higher life expectancy could result in elevated healthcare and financial expenses. Nevertheless, the interactive regression model suggests that there is no significant moderation of the association between government expenditure on health and economic growth by life expectancy, implying that the influence of government health expenditure on economic growth is generally unaffected by demographic changes. These findings emphasize the significance of differentiating between the short-term and long-term economic consequences of healthcare expenditure. This study offers insights into the optimization of public spending in OECD nations to promote sustainable economic growth and enhance public health outcomes.

Keywords: *Economic Growth, Government Health Expenditure, Life Expectancy, OECD Countries.*

1. Introduction

The global COVID-19 pandemic has demonstrated that the state of health and well-being is a crucial determinant for maintaining an economy and promoting growth in the economy. In the Trade Policy Paper of the Organisation for Economic Co-operation and Development (OECD, 2022), infectious diseases are identified as one of the primary causes of death, contributing to 25% to 30% of global mortality. The report suggested that the global real Gross domestic product (GDP) has declined by 2.3%. Poorer worker productivity across all industries and geographical regions is the primary cause of this reduction, which alone results in a 4.6% decline in global real GDP. Many advantages that contribute to economic growth result from a healthy population. An advancement in human and physical capital enhances productivity and GDP per capita (Neofytidou & Fountas, 2020). A healthy population is more resilient and better able to withstand economic shocks during times of crisis.

Amidst these changes, there has been much focus on the impact of government health expenditures on economic growth. Despite substantial changes in government expenditure on health, there exists ambiguity regarding its relationship with economic growth. According to Jiang and Wang (2023), a decrease in immediate government spending on healthcare results in a 10.99% decrease in the GDP per capita. This has proven that government health expenditure has a significant relationship with economic growth. It is reasonable to argue that government has constraints in adjusting its healthcare expenditure because of the rigidity of budgetary and fiscal systems (Jay, Peng, Xuezheng, & Shufang, 2013, Jiang & Wang, 2023). Although governments around the world have made significant investments in health, the impact of these expenditures on economic growth is still a topic of continuous discussion.

In addition, life expectancy plays a significant role in impacting the efficacy of government health expenditure in fostering economic growth. A strand of studies extensively discussed The association between economic growth and maternal mortality ratio is moderate yet beneficial. For example, a study by Islam, Mondal, & Haitham (2023) showed a significant negative relationship between economic growth and infant mortality, vehicular mortality and healthcare spending. Thus, this indicates that life expectancy has a moderating effect on government health expenditure and economic growth. Moreover, a study by Shafi and Samreen (2019)

suggested that life expectancy in G7 countries increases steadily with the increase in per capita income of the GDP. Nations that had significant growth in life expectancy, as a result of the sudden decrease in mortality show lower rates of economic growth per capita. Furthermore, a detrimental correlation is observed between the starting level of life expectancy and the subsequent rate of rise in GDP per capita. On the other hand, an increase in life expectancy had a detrimental effect on the growth rate of GDP per capita. It reveals that the reverse mechanism, where income affects health, explains a significant portion of the positive correlations between life expectancy and GDP per capita across different countries (Hansen & Lars, 2015).

Additionally, an increase in expenditure does not necessarily result in an improvement in healthcare. The actual level of health expenditure in nations that are members of the OECD amounts to 5.48 percent of GDP, while simultaneously, the economic growth rate is 1.87 percent (Wang, 2015). After taking into account the effects of inflation, the total amount of money spent on health care around the world in 2019 was 8.5 trillion dollars, which is more than twice as much as the amount spent in 2000, which was 4.2 trillion dollars. Approximately 60 % of the costs associated with healthcare were covered by the government, while forty percent were covered by private sources inside the country. Only 0.21 % of the entire cost of healthcare was accounted for by assistance from outside sources. During the same period, the Gross Domestic Product (GDP) of the entire world increased by 74%, going from 50 trillion dollars to 86 trillion dollars. Because of this, the percentage of the world's gross domestic product that is allocated to health spending has increased from 8.5% to 9.8% (WHO, 2021).

Therefore, this study aims to examine the relationship between government health expenditure and economic growth. The study also intends to gauge the moderating role of life expectancy on the relationship between government health expenditure and economic growth. This study focuses on 38 OECD countries for a period from 2000 to 2021. These nations have reliable data on government health spending and economic indicators, allowing for comprehensive analysis. The OECD's focus on policy cooperation and best practices provides a valuable framework for assessing how health spending impacts economic growth. By studying OECD countries, this study benefits from high-quality data, cross-national comparisons, and insights into the relationship between healthcare spending and economic growth. Previous studies show that reducing health spending can significantly lower GDP per person, indicating a short-run link between GHE and economic performance (Jiang & Wang, 2023). Countries with rising life expectancy indicate changes in GDP growth, influenced by factors such as mortality rates and healthcare spending (Islam, Mondal & Haitham, 2023).

2. Literature Review and Hypotheses Development

Theoretical consideration

Keynesian economics emphasizes the concept of the "multiplier effect," which suggests that a small increase in government expenditure such as, on healthcare, can result in a significantly greater growth in overall economic activity. This theory offers a framework for comprehending how public health expenditure could enhance economic growth. An increase in health expenditures has the potential to stimulate economic growth by increasing labor productivity and reducing the costs of healthcare for both individuals and businesses within the economy. In the long run, consistent investments in health care have the potential to bring about improvements in human capital over time, which is critical for sustained economic success. A strand of studies has been done to assess the relationship between the expansion of the economy and the expenditures made by the government on healthcare. A recent study by Ekong, Paul, & Alex (2024) shows that Nigeria's healthcare expenditures had a significant and positive influence on inclusive growth. The findings of this study lend credence to Keynesian ideas, which advocate for the implementation of active fiscal policies to improve economic performance. It is also evidence that in the long-term, government expenditure, including health care spending has positively influenced the economy's expansion (Ozoemene et al., 2024 and Buthelezi, 2023) and health spending indirectly increases economic growth through higher labor productivity (Alwago, 2023).

Furthermore, public health spending is consistent with both Wagner's and Keynesian theories, demonstrating a clear connection between higher health expenditure and economic growth such as studies done by (Bello & Syder, 2024 and Aderobaki and Falope, 2024). Investments in people's health, education, and other aspects of human capital will have a favorable impact on the economy (Grossman, 1999). Societies that make investments in people's health and well-being see a rise in productivity and economic prosperity. Although increasing health

capital always promotes economic growth, the overall impact of health on the pace of economic growth relies on how it impacts the accumulation of physical capital (Gong, Li, & Wang, 2012) and better health boosts productivity and efficiency at work. Healthy people use fewer sick days, are better equipped to execute their jobs both intellectually and physically and make more of an economic contribution (Litchenberg, 1992). In conclusion, the Keynesian economic theory highlights the significance of government intervention in promoting economic growth and maintaining stability in the economy by implementing fiscal policies, especially on public healthcare expenditure.

Hypotheses Development

Government health expenditure and Economic growth

Studies have shown that the health of a nation has many impacts on its economic progress. As a nation's health improves, it can generate greater output using a fixed combination of human capital, technical expertise, and skills (Kareem et al., 2017). Government spending on healthcare had a lesser impact on economic growth when compared to expenditures on infrastructure, education, and agriculture, all of which had greater impacts (Magai & Rosemary, 2023). This is because when they increase income, individuals will foster positive habits or enhance health throughout a person's lifetime (Oni, Aninkan, & Akinsanya, 2014). It is also evidence that in the long term, population health has influenced economic growth and is a crucial determinant of economic productivity as proposed by the endogenous growth models (Dauda, 2011). In addition, a sustained economic expansion is fostered by both public and private investments within the country, together with expenditures on healthcare (Al Shahrani & Al Sadiq, 2014). Therefore, this study proposes a hypothesis as below:

H_1: *There is a significant relationship between Government health expenditure and Economic growth.*

Life expectancy and economic growth

The Keynesian paradigm recognizes the substantial influence of population health on a nation's economic progress, as evidenced by its incorporation of life expectancy as an investment metric. The analysis reveals a statistically significant and negative correlation between life expectancy and economic inequality across different countries and throughout time, even after controlling for factors such as income and poverty (Hansen, 2015). Overall, the increase in life expectancy, which led to a higher population, originally resulted in a fall in income per capita. However, this negative effect gradually lessened over the next four decades. Insufficient empirical evidence exists to substantiate the claim that the increase in life expectancy has led to a rapid increase in per capita income. Prior research has greatly weakened the notion that health is the main driver of economic growth (Acemoglu & Simon, 2006). A study revealed that the increase in expenses between 1990 and 2011 was mostly caused by the aging population, accounting for two-thirds of the total. The remaining one-third was attributed to excessive cost growth (Neofytidou & Fountas, 2020). This study proposes two hypotheses, (H_2) and (H_3) of the study as below:

H_2: *There is a significant relationship between Life expectancy and economic growth.*

H_3: *Life expectancy significantly moderates the relationship between Government health expenditure and Economic growth.*

This study also includes three control variables, namely trade, inflation and unemployment. Trade is an important element of the economic growth of a nation. Past studies argued that elements related to commerce, investment, education, and population have a significant influence on economic growth in the long term relative to other factors (Stephan & John, 2020). A nation's GDP experiences growth as its level of trade openness expands. This is because increased trade openness enhances the country's integration with the global economy (Kinfack & Bonga-Bonga, 2023). Furthermore, trade openness has a positive impact on economic development, depending on baseline income per capita and other factors (Makun, 2017).

Meanwhile, a gradual increase in the average price level of goods and services in an economy leads to a decrease in the purchasing power of a currency. Studies have shown a direct association between inflation and economic growth. There is evidence of a negative effect of inflation on GDP growth (Tien, 2021). Furthermore, inflation is more responsive to changes in growth rates compared to how growth is affected by fluctuations in inflation rates (Maliik & Anis, 2001). Conversely, unstable or excessive inflation can lead to reduced purchasing power, unpredictability, and changes in consumer behavior, all of which can affect the overall level of consumption in an economy. Inflation has a crucial role in determining economic growth, and it has been emphasized that higher levels of inflation will lead to reduced levels of investment (Barro, 1995).

GDP is a crucial measure of an economy's magnitude and well-being, strongly impacted by employment level. The relationship between employment and economic growth is intricate, and fluctuations in employment can have a direct or indirect impact on economic growth. A study discovered that there has been a decrease in the mobility of jobs and economic growth (Ying et al., 2021). High levels of unemployment can lead to inefficient use of resources and can affect government spending on healthcare and economic growth (Farsio & Quade, 2003). Overall, this study examines how government healthcare expenditure might contribute to a reduction in unemployment and promote increased consumer spending.

3. Research Methodology

Data

This study utilizes the dataset from the year 2000 to 2021 of 38 members of the Organization for Economic Co-operation and Development (OECD) countries. These countries are; Austria, Australia, Belgium, Canada, Chile, Colombia, Costa Rica, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Republic of Korea, Latvia, Lithuania, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, and United States of America. The sources of data are from reputable databases; the World Bank Data for economic growth, government health expenditure, inflation, trade, and unemployment, and the OECD Health Statistic for life expectancy data.

Measurement of variables

Table 1 presents the measurement of variables used in the study.

Table 1: Measurement of variables

Variables	Definition	Measurement of variables
Economic Growth	The economic growth rate is a measure of the increase in a country's economic output over a specified period, typically expressed as a percentage. It represents the rate at which a nation's Gross Domestic Product (GDP) grows, adjusted for inflation, indicating the overall health and expansion of an economy.	Percentage change in Gross Domestic Product (GDP) over a specific period (usually quarterly or annually), adjusted for inflation. Unit: Percentage (%) Source: World Bank.
Government Health Expenditure (Current health expenditure % of GDP)	Government Health Expenditure refers to the total amount of money that a government allocates and spends on healthcare services, infrastructure, and initiatives for its population.	Total public spending on health services, preventive care, infrastructure, and research as a percentage of Gross Domestic Product (GDP). Unit: Percentage of GDP (%) Source: OECD Health Statistic, World Bank.
Life Expectancy at birth, total (years)	Life expectancy at birth is a statistical measure that estimates the average number of years a newborn is expected to live, assuming that the mortality rates at the time of their birth remain constant throughout their lifetime.	The average number of years a newborn is expected to live, assuming current mortality rates remain constant. Unit: Years Source: OECD Health Statistic, World Bank.
Trade (% GDP)	Trade (% of GDP) is a measure that indicates the relative importance of international trade (both exports and imports) in the economy of a country. It is calculated as the sum of a nation's exports and imports of goods and services, divided by its Gross Domestic Product (GDP), and expressed as a percentage.	The sum of exports and imports of goods and services as a percentage of Gross Domestic Product (GDP). Unit: Percentage of GDP (%) Source: World Bank.

Inflation : (Consumer Prices Annual %)	Inflation (Consumer Price Annual) refers to the percentage change in the average price level of a basket of goods and services typically purchased by households over a year. This measure tracks how much the cost of living increases (or decreases) from one year to the next. It is usually calculated based on the Consumer Price Index (CPI), which monitors the prices of items such as food, housing, transportation, healthcare, and other everyday expenses.	Annual percentage change in the Consumer Price Index (CPI), which tracks the prices of a typical basket of goods and services. Unit: Percentage (%) Source: World Bank.
Unemployment rate (ILO)	The Unemployment Rate (ILO) refers to the percentage of the labor force that is unemployed and actively seeking work, as defined by the International Labour Organization (ILO). This measure is a widely used indicator of the labor market's health and reflects the proportion of people who are not employed but are available and willing to work.	Percentage of the total labor force that is unemployed but actively seeking employment, as per the International Labour Organization (ILO) definition. Unit: Percentage of the labor force (%) Source: World Bank.

Economic growth is measured by the growth rate of the GDP. The term "gross domestic product" (GDP) refers to a metric that measures the annual percentage increase in the value of all goods and services that are produced inside a country. Gross Domestic Product (GDP) is calculated by aggregating the overall monetary worth of all goods and services generated inside a nation during a defined timeframe, usually a year or a quarter. The GDP growth rate is calculated by comparing the GDP of the current period to that of a prior period and expressing the change as a percentage, which indicates the extent to which the economy has expanded or contracted over time.

The Government healthcare expenditure (GHE) is a measurement that determines the proportion of a nation's gross domestic product that is allocated to healthcare expenditures (Al Shahrani & Al Sadiq, 2014). It demonstrates the government's expenditure on healthcare and the allocation of resources to sustain and enhance public health. In terms of measurement, the GHE is expressed as a percentage of the GDP.

Life expectancy (LE) refers to the average number of years that an individual is anticipated to live, taking into consideration the rates of mortality that are now in effect (Bloom, 2000). Life expectancy is determined by computing the mean number of years an individual is projected to live, taking into account the present mortality rates. This computation takes into account the mortality rates particular to different age groups within a community, usually by analyzing data from birth and death records within a defined timeframe. The metric for life expectancy is measured in years. The data was obtained from OECD health statistics and the World Bank.

Trade is the level of a nation's participation in international trade, which takes into account both the importing and exportation of goods and services at the national level. This entails calculating the total monetary worth of all goods and services sold to foreign nations (exports) and purchased from foreign nations (imports). Trade is quantified by computing the total value of exports and imports as a fraction of the GDP (Frankel & David, 1999). In addition, inflation is a decrease in one's ability to purchase goods and services is the outcome of inflation, which is a measurement of the rate at which the average prices of products and services increase over some time (Barro, 1995). Typically, this is accomplished by employing an indicator represented by the Consumer Price Index (CPI) that calculates the average fluctuation in prices that consumers pay. Quantifying inflation as a percentage effectively illustrates the extent to which prices have risen or fallen in a previous timeframe. This serves as a reliable measure of the overall expenses associated with daily life and the ability to buy goods and services during a certain period. Finally, this study defines unemployment as the percentage of the labor force that is now without a job but is actively looking for work. It is quantified by determining the proportion of individuals in the workforce who are actively searching for employment but are unable to secure a job. The unemployment rate is calculated by first dividing the total number of people in the labor force by the number

of people who are currently without jobs, and then multiplying the resulting figure by 100 (Farsio & Quade, 2003). The dataset is obtained from the World Bank database.

Empirical model

Equation (1) presents the model used in the study.

$$y_{it} = \alpha + \beta X_{it} + \theta(g*l)_{it} + \gamma Z_{it} + \varepsilon_{it} \quad (1)$$

Where y_{it} is economic growth for the country I at time t. α is the intercept, βX_{it} represents the independent variable of interest, namely; government health expenditure (g) and life expectancy (l). In addition, the study also aims to gauge the interaction effect of the relationship between government health expenditure and economic growth, $\theta(g*l)_{it}$ represents an interaction variable of interest (government health expenditure times and life expectancy, as a moderator). γZ_{it} represents other control variables (inflation, unemployment, trade). Finally, ε_{it} is the error term.

4. Results and Discussion

Descriptive Analysis

Table 2 shows the descriptive analysis for all variables used in the study. The variables are Economic growth (EG), Government health expenditure (GHE), Life expectancy (LE), Inflation (I), Unemployment (UE), and Trade (T). GL is the interaction term of GHE and LE.

Table 2: Descriptive statistics

Variables	Observations (N)	Mean	Standard Deviation	Minimum	Maximum
EG	836	2.4614	3.5006	-14.8386	24.4753
GHE	836	8.3867	2.1936	3.8976	18.8158
LE	836	78.9987	3.1532	70.133	84.56
GL	836	666.234	186.615	295.8654	1400
GHE_C	836	0.0000	2.1936	-4.4891	10.4291
LE_C	836	0.0000	3.1532	-8.8657	5.5613
GL_C	836	3.6941	6.371	-23.9536	31.5181
I	836	2.7919	3.9232	-4.4781	54.9154
UE	836	7.5728	4.0422	1.81	27.47
T	836	93.4309	55.0098	19.5596	393.1412

The descriptive analysis of the variables offers valuable insights into the economic growth and government expenditure on healthcare across the sample countries. Economic growth (EG) has a mean value of 2.46% and a standard deviation of 3.50% which reflects considerable variability in economic growth across countries. This also suggests that the OECD countries are at various stages of economic development, which could be attributed to factors such as differences in health policies, economic structure, and external economic conditions. Government Health Expenditure (GHE) shows a mean of 8.39%, indicating that, on average, the countries allocate a moderate proportion of their GDP to healthcare. The standard deviation of 2.19% demonstrates a moderate degree of variability in GHE across the sample. This variation in GHE also highlights differing national priorities and fiscal capacities across countries, which could have significant implications for health outcomes and their impact on economic performance. Life Expectancy (LE) has a mean of 79 years, indicating that most countries in the sample have relatively high life expectancy, which correlates with good healthcare systems and better public health policies. The standard deviation of 3.15 years suggests relatively small variations in life expectancy across countries.

Inflation (I) has a mean of 2.79%, indicating that inflation rates were generally moderate across the sample countries. However, the standard deviation of 3.92% reveals substantial variability in inflation rates, which reflects the different macroeconomic conditions across the sample countries and the varying effectiveness of their monetary policies. The unemployment rate (UE) has a mean of 7.57%, indicating moderate unemployment levels across the sample. The standard deviation of 4.04% shows noticeable differences in unemployment rates among the countries. Lastly, trade (T) has a mean of 93.43% which indicates that trade plays a significant role in the economies of most OECD countries. The standard deviation of 55.01% suggests a wide range of trade openness, with some countries being highly integrated into the global economy and others being relatively more closed to international trade. In summary, these findings establish a basis for comprehending the intricate relationship between economic growth, health expenditures, and demographic considerations.

Table 3: Correlation coefficients

Variables	EG	GHE	LE	I	UE	T
EG	1.0000					
GHE	-0.3047	1.0000				
LE	-0.2277	0.5347	1.0000			
I	0.1396	-0.3210	-0.3964	1.0000		
UE	-0.0859	-0.1572	-0.2297	0.0204	1.0000	
T	0.1171	-0.2558	-0.0501	-0.0882	-0.0811	1.0000

The correlation analysis shows that economic growth (EG) has a weak negative correlation with both government health expenditure (GHE) and life expectancy (LE), indicating that higher GHE and LE are slightly associated with lower economic growth. GHE and LE, however, have a moderate positive correlation, suggesting that greater health spending is linked to longer life expectancy. Inflation has a weak positive correlation with EG but is negatively related to both GHE and LE, while unemployment shows weak negative correlations with EG, GHE, and LE. Trade openness has a weak positive correlation with GDP and a weak negative correlation with GHE and LE, suggesting minor relationships between trade and these variables.

The study first examines the effects of the set of explanatory variables on economic growth using the static panel data model. Log transformation is done on all variables to ensure more stable and normally distributed data. The results of the BPLM Test and Hausman Test indicate that the Fixed Effects model is the most appropriate. Table 4 reports the Fixed Effects regression results with robust standard errors following Driscoll and Kraay (1998). Robust standard errors are estimated due to the presence of heteroscedasticity, serial correlation and cross-sectional dependency as reported in Table 5.

Table 4: Regression results

Explanatory Variables	Dependent Variable: LEG			
	Pooled OLS	**FE**	**RE**	**FE***
LGHE	-0.8450***	-0.1074	-0.6275***	-0.1074
	(0.1353)	(0.3019)	(0.2022)	(0.6888)
LLE	-2.8470***	-8.7731***	-4.4087***	-8.7731***
	(0.9209)	(2.1131)	(1.3011)	(2.7218)
LI	0.0155	-0.0686	-0.0214	-0.0686
	(0.0344)	(0.0383)	(0.0360)	(0.0701)
LUE	-0.0912	-0.3565***	-0.2121***	-0.3565**
	(0.0636)	(0.0918)	(.0777)	(0.1436)
LT	0.0400	0.6721*	0.1302	0.6721*
	(0.0577)	(0.2602)	(.0940)	(0.3546)
Constant	15.1760***	37.2924***	21.3964***	37.2924***
	(3.9501)	(8.3370)	(5.4618)	(11.9284)
BPLM Test		56.29***		

(P-Value)		(0.0000)		
Hausman Test		18.21***		
(P-Value)		(0.0027)		
F-Statistics	25.40***	7.80***		10.04***
(P-Value)	(0.0000)	(0.0000)		(0.0001)
Wald Statistics			58.32***	
(P-Value)			(0.0000)	
Obs. (N)	669	669	669	669
R-Squared	0.1608	0.0587	0.1483	0.0587

Note: ***, ** and * indicates statistical significance at 1%, 5% and 10% respectively. FE* model is a Fixed Effect estimation with Driscoll and Kraay's (1998) robust standard error.

Table 5: Diagnostic tests

	Modified Wald Test for Heteroscedasticity	Woodridge Test for Autocorrelation	Pesaran's Test for Cross-Sectional Dependency
Chi2 Statistics	985.39***		
(Probability > Chi2)	(0.0000)		
F-Statistics		67.976***	
(Probability > F)		(0.0000)	
C-D Statistics			30.752***
(Probability)			(0.0000)

In examining the factors that influence economic growth, several key relationships have been identified through static models as in Table 4. A higher life expectancy and lower unemployment rates are both associated with lower economic growth, while higher trade is linked to higher economic growth. However, government health expenditure and inflation do not show statistically significant impacts on economic growth. The negative relationship between life expectancy and economic growth may seem unexpected, but in some cases, countries with higher life expectancy may face an aging population, which could result in a shrinking workforce, reduced productivity, and increased spending on pensions and healthcare, ultimately slowing economic growth. This finding is supported by the study of Sirag, Nor, and Law (2020) who found that the benefits of higher life expectancy may be offset by the economic burdens associated with an aging population, such as increased healthcare costs and a shrinking workforce. Other studies done by Bunyaminu et al.(2022) as well as Dauda (2011) also showed similar findings.

This study also found that higher unemployment rates are strongly associated with lower economic growth. This aligns with Okun's Law, which posits an inverse relationship between unemployment and economic output. Higher unemployment implies the underutilization of labor resources, which reduces output, productivity, and consumer spending, leading to slower economic growth. Our finding is supported by various studies such as Suyanto (2023), and Amar et al. (2022) which highlight the detrimental consequences of high unemployment on economic growth. This relationship is critical for policymakers aiming to stimulate economic growth through job creation and labor market interventions.

On the other hand, the positive relationship of economic growth with trade highlights the importance of global integration for economic performance. Countries more open to trade benefit from access to larger markets, increased competition, and the transfer of technology and knowledge, all of which can boost economic growth. Kinfack and Bonga-Bonga (2023) further reinforce our finding by providing evidence of a significant positive relationship between trade openness and economic growth in African countries. Moreover, Makun (2017) emphasizes that trade openness not only increases productivity but also fosters research and development (R&D) activities, which are crucial for long-term economic growth.

However, government health expenditure does not have a significant impact on economic growth in this sample. This could suggest that the short-term economic benefits of health spending are not immediately

visible in economic growth figures. Furthermore, other factors such as efficiency in health spending or healthcare system quality could play a more crucial role in translating health expenditure into economic benefits. Our findings are supported by various empirical analyses such as Alam, Singh & Singh (2022), Islam, Modal & Haithman (2023) further reinforcing the idea that health spending may not always translate into economic growth. While the coefficient of inflation is negative as expected, it is also found to be insignificant. This is in line with the finding of Azam & Khan (2022) who reported that the overall impact of inflation on growth was not statistically significant, suggesting that other macroeconomic variables may play a more critical role in influencing economic growth.

Next, the study also examines the effects of government expenditure on health and life expectancy on economic growth using the dynamic panel data model. Similarly, log transformation is done on all variables. Table 6 reports the results of the Two-Step First Difference GMM and Two-Step System GMM, which are consistent in terms of the coefficient signs and significance levels, thus reinforcing the robustness of the findings. Nonetheless, the System GMM estimator typically provides more efficient results compared to First Difference GMM because it combines both level and differenced equations, thus allowing for a more robust estimation of parameters. Thus, this study mainly discusses the results of the System GMM.

Table 6: Regression result

Explanatory Variables	Dependent Variable: LEG	
	Two-Step First Difference GMM	Two-Step System GMM
Lag LEG	0.5233***	0.4290***
	(0.1292)	(0.0890)
LGHE	-4.7727***	-4.5212***
	(1.2570)	(1.1049)
LLE	20.4610	9.0588
	(18.2155)	(11.3456)
LI	-0.2130**	-0.1955**
	(0.0886)	(0.0861)
LUE	-0.0300	-0.1984
	(0.3429)	(0.2828)
LT	-0.3878	-0.0389
	(0.8149)	(0.6526)
Constant		-29.0200
		(46.9152)
AR(1)	-3.38***	-3.82***
	(0.001)	(0.000)
AR(2)	-1.79	-1.95
	(0.073)	(0.052)
Sargan Test	0.88	1.98
	(0.349)	(0.371)
Hansen Test	1.09	2.10
	(0.295)	(0.350)
Difference-in-Hansen Test		1.18
		(0.277)

Note: ***, ** and * indicates statistical significance at 1%, 5% and 10% respectively. Both GMM models are estimated with robust standard error.

The Two-Step System GMM results highlight key dynamics in the relationship between variable of interest, government health expenditure and life expectancy on economic growth (EG). The persistence in economic growth, as indicated by the significance of lagged LEG, shows that past growth influences current economic performance. This is a common feature in dynamic models, as past economic conditions typically create a push for future growth. Liu (2019) reported a similar finding that historical growth rates play a crucial role in determining current economic performance, aligning with the idea of persistence in economic growth.

The coefficient for GHE is unexpectedly negative but significant at a 1% level. This negative relationship may seem counterintuitive but could be explained by the short-term nature of the data. High health expenditure might not lead to immediate productivity gains, and it can divert resources from other productive sectors in the short term. This finding is consistent with Alam, Singh, and Singh (2022) who found that government expenditures on healthcare have a long-run negative effect on GDP growth in Saudi Arabia. This is corroborated by the work of Faruk, et al. (2022) which identifies that health spending does not lead to increased economic growth, particularly in regions with poor institutional quality.

The coefficient for inflation is negative and is significant at the 5% level. This negative relationship aligns with traditional economic theory, where high inflation increases uncertainty, reduces purchasing power, and leads to less investment and consumption, ultimately slowing economic growth. Our finding is consistent with Živkov, Kovačević, and Papić-Blagojević (2020) who reported that inflation uncertainty has a significant negative spillover effect on economic growth, suggesting that higher inflation can hinder economic performance. Furthermore, Azam and Khan (2020) found that inflation negatively impacts economic growth, particularly when inflation rates exceed certain thresholds, reinforcing the idea that high inflation is detrimental to economic performance.

Life expectancy is not statistically significant, suggesting that there is no clear relationship between life expectancy and economic growth in this model. While higher life expectancy might generally be expected to boost growth in the long run, its immediate impact on economic growth might be negligible, especially if other mediating factors such as aging populations or healthcare costs offset the potential benefits of longevity. While the coefficient for unemployment is negative as expected, it is not significant. This could be due to a variety of factors, including variations in labor market policies or the structure of unemployment across countries. It may also indicate that other factors, such as labor market flexibility or social protection systems, mitigate the expected negative impact of unemployment on growth. Lastly, trade is also not statistically significant, indicating no clear relationship between trade openness and GDP in this model. This lack of significance may stem from different trade dynamics in the countries studied, such as the nature of traded goods or services and their relative importance to the domestic economy. Additionally, trade effects may take time to materialize or depend on complementary factors like infrastructure or innovation.

In terms of instrument validity, the Arellano-Bond Tests indicate that there is a first-order serial correlation but no second-order serial correlation in the residuals, implying that the model's instruments are appropriate and that the error terms are correctly specified. Furthermore, both the Sargan test and the Hansen test are not significant, which indicates that the instruments used in the model are valid and the model does not suffer from overfitting or endogeneity issues. Lastly, the Difference-in-Hansen Test is not significant, confirming that the additional instruments used in the System GMM are valid when compared to the First Difference GMM. This supports the use of the System GMM approach and strengthens confidence in the results.

Table 7: Regression result with interaction terms

	Dependent Variable: LEG			
	FD GMM Lag(1 2)	**SYS GMM Lag(1 2)**	**FD GMM Lag(1 3)**	**SYS GMM Lag(1 3)**
L.leg	0.511***	0.393***	0.452**	0.449***
	(0.126)	(0.0845)	(0.142)	(0.0839)
ghe_c	-0.598***	-0.601***	-0.678***	-0.680***
	(0.171)	(0.157)	(0.184)	(0.182)
le_c	0.302	0.141	0.207	0.205
	(0.212)	(0.144)	(0.211)	(0.178)
gl_c	0.0487	0.0289	0.0656	0.0645
	(0.0437)	(0.0394)	(0.0533)	(0.0429)
li	-0.213*	-0.190*	-0.179	-0.178
	(0.0885)	(0.0859)	(0.105)	(0.102)
Lue	-0.0305	-0.212	-0.0560	-0.0584
	(0.332)	(0.285)	(0.357)	(0.312)
lt	-0.363	-0.0225	0.162	0.163

	(0.830)	(0.662)	(0.804)	(0.826)
_cons		0.972		-0.403
		(3.115)		(3.709)
Obs (N)	459	554	459	554
AR(1)	-3.45***	-3.76***	-3.03***	-3.92***
	(0.001)	(0.000)	(0.002)	(0.000)
AR(2)	-1.82	-2.06**	-1.89	-3.92
	(0.069)	(0.040)	(0.059)	(0.063)
Sargan Test	0.82	2.64	5.99	6.10
	(0.366)	(0.267)	(0.050)	(0.107)
Hansen Test	1.01	2.44	6.50**	6.58
	(0.316)	(0.295)	(0.039)	(0.087)
Diff in Hansen		1.12		6.58**
Test		(0.290)		(0.037)

The relationship between government expenditure on health and economic growth is a topic of great interest and importance in understanding the dynamics of a country's economy. In this analysis, this study focuses on the impact of lagged economic growth and government health expenditure on economic growth. While some variables show significant relationships with economic growth, others, such as life expectancy, unemployment, and trade, do not exhibit clear correlations in this model. These results indicate that government health expenditure has a significant impact on economic growth, while the effects of Life expectancy are not statistically significant in this model. The lagged economic growth has a positive and significant impact on the current economic growth, indicating persistence in economic growth over time.

In terms of the interaction model, the results of the dynamic panel regressions using First Difference GMM (FD GMM) and System GMM (SYS GMM), with different lag structures, are presented in Table 7. Across all specifications, lagged economic growth is significant, which indicates that economic growth in the previous period positively influences current economic growth, suggesting persistence in economic growth. The coefficient for GHE is negative and significant at the 1% level across all specifications. This suggests that increases in government health expenditure are associated with a decrease in economic growth. A negative relationship might reflect the short-term impact of reallocating resources to healthcare, which could crowd out investment in other productive sectors. It could also indicate inefficiencies in health spending that do not translate into immediate economic gains.

LE is not statistically significant in any of the models, indicating that there is no clear evidence of a direct relationship between life expectancy and economic growth. This may suggest that the impact of life expectancy on growth is indirect or manifests over the long term, as countries with high life expectancy may also face challenges like aging populations, which can offset potential economic benefits. The coefficient for the interaction term (GL) is positive but not statistically significant in any of the models. This suggests that life expectancy does not have a moderating effect on the relationship between government health expenditure and economic growth in this model. The lack of significance could mean that, in the short run, the relationship between health expenditure and life expectancy does not have a strong, combined impact on economic performance.

The coefficient for inflation is negative and significant at the 10% level in the FD GMM Lag(1 2) and SYS GMM Lag(1 2) models. This aligns with the theory that higher inflation creates economic instability, reduces purchasing power, and discourages investment, thus negatively affecting growth. Unemployment and trade are not statistically significant in any of the models, suggesting no strong evidence of a direct relationship between unemployment and trade with GDP growth in this sample. Unemployment may be insignificant due to differences in labor market structures or policies that mitigate the negative effects of unemployment on economic performance. On the other hand, the insignificance of trade might stem from varying trade structures and external factors affecting the economic performance of the countries in the sample.

The results of the diagnostic tests are crucial for assessing the validity of the GMM models and ensuring that the results are reliable. The results generally support the validity of the GMM models, particularly in the Lag(1

2) specifications, which show no major issues with autocorrelation or instrument validity. However, caution should be taken with the Lag(1 3) specifications, especially for the FD GMM Lag(1 3) model, where the Hansen test indicates possible overfitting or instrument problems.

5. Conclusion

The objective of the study is to examine the influence of government health expenditure and life expectancy on economic growth in OECD nations between 2000 and 2021. The study uses both static and dynamic panel data models. The study also aims to determine whether life expectancy has a significant role in moderating the relationship between GHE and economic growth. The study's findings indicate that in the short term, GHE has a detrimental effect on economic growth, maybe because of the acute financial strain caused by healthcare expenses. The study emphasized the need for policies that effectively manage immediate financial expenses while also considering the long-term advantages of investing in healthcare. Additionally, the study found a negative relationship between life expectancy and economic growth, indicating that a greater life expectancy could result in escalated healthcare and pension expenses, thereby impeding economic growth in the long run. There is no meaningful moderating effect of life expectancy on the relationship between GHE and economic growth. This outcome emphasizes the intricacy of demographic issues and their diverse effects on economic growth in the sample study. In conclusion, the study highlighted the significance of differentiating between the immediate and long-term economic consequences when developing healthcare spending plans. It is recommended that policymakers take a long-term approach to healthcare spending, understanding that although the initial expenses may be substantial, the long-term advantages include enhanced public health and increased economic output.

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Determinants of Online Dating Application Among Millennials

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Abstract: Online dating has become increasingly popular in recent years, these platforms provide a convenient and accessible way to meet new people. Studies on the use of dating applications among men and women highlight how these technologies shape communication practices and social relationships. For this study, the Unified Theory of Acceptance and Use of Technology (UTAUT) was applied to discover the determinants of online dating apps' adoption intention. Possible determinants that might affect the intention to adopt online dating apps are sought and critically reviewed. The variables proposed in this research include performance expectancy, effort expectancy, social influence, facilitating conditions, and an additional variable – trust. Five hypotheses were constructed, questionnaires were distributed and responses were collected to determine the adoption intention of young millennials in Malaysia. The test results indicated that trust, performance expectancy and social influence influenced the adoption intention of online dating applications. Based on the results, for performance expectancy, it was revealed that users expressed concerns about the utility of dating applications in facilitating beneficial functions, such as broadening social networks, enhancing dating opportunities, and meeting dating needs. For social influence, it revealed that individuals, especially peers, who hold significance in their lives, influence their decision to engage with online dating apps. These influential individuals impact the users' intentions by communicating the benefits of online dating apps and recommending their use. As trust improves, millennials are less reluctant to adopt online dating apps, contributing to an increase in the user base for such applications.

Keywords: *Online Dating, Application, Adoption Intention, Theory of Acceptance, Use of Technology*

1. Introduction and Background

Dating originated in the early 20th century, preceding which young individuals were prohibited from dating before marriage. In the 1900s, dating was considered a potential felony, akin to prostitution in the eyes of authorities (Brown, 2016). By the mid-1920s, dating had completely replaced the traditional courtship system, with a fundamental difference lying in the level of freedom. Relationships transitioned from being stringent to becoming more personal (Markarian, 2017). Recognizing the desire for a romantic relationship often brings awareness to the challenges of finding an ideal partner (Finkel et al., 2012).

Technological advancements have led people to turn to online platforms for dating and forming romantic connections. The inception of online dating traces back to 1965 with the creation of the first computer-based matchmaking service, Operation Match, by Harvard undergraduates in the United States, paving the way for future developments in online dating (Lee, 2016). Studies on online dating have delved into various aspects of this modern phenomenon, including the impact of different platforms, the behavior of users, and the overall success rates of online matches. Much research has explored the psychological and sociological effects of online dating, shedding light on the dynamics of virtual relationships and the implications for real-life interactions.

The evolution of online dating sites is categorized into three stages: (1) online personal advertisement sites, (2) algorithm-based matching sites, and (3) mobile dating apps. The origin of web-based personal advertisement sites can be traced back to Match.com in 1995, functioning as a search engine for online personal advertisements. Algorithm-based matching sites, such as eHarmony, PerfectMatch, and Chemistry, emerged in the early 2000s, providing matches based on user-provided data. The third generation of online dating, smartphone-based dating apps, gained momentum after the launch of the App Store in 2008, incorporating location-based features and gaining widespread popularity (Finkel et al., 2012).

In the 2020s, the proliferation of online dating sites and apps has been rapid. Examples include Tinder, Bumble, OkCupid, Match.com, Facebook Dating, Paktor, and Tantan, among others (Corpuz, 2021; GMO Research, 2021). The user base of online dating apps has experienced substantial growth, with a 46% increase worldwide, from 185 million users in 2015 to 270 million in 2020, as reported by Curry (2021). Additionally, global revenue from dating apps reached USD 3.08 billion in 2020, marking a 50% increase over the past four years, with projections exceeding USD 8.4 billion in the next four years (GMO Research, 2021).

According to GMO Research (2021), 32.4% out of 1000 Malaysians have used an online dating app before, and 47.8% out of 32.4% of Malaysians are currently using an online dating app. Based on Müller's (2022) studies, the adoption rate of online dating apps among young adults in Malaysia is higher when compared to other age categories. Approximately 41% aged 16-24 and 43% aged 24-34 stated that they had used online dating apps. Besides, Tinder has arisen as the most popular online dating app in Malaysia, followed by Dating.com, Tantan, OkCupid, Grindr, Coffee Meets Bagel, Paktor and Bumble (Müller, 2021). People are using online dating apps as a mechanism to find virtual connections for friendship and emotional support for coping with loneliness. There must be an upward trend in relationships starting online. As online dating becomes mainstream, it may lead to more genuine relationships and even marriages (GMO Research, 2021). Lastly, research on digital intimate publics reveals the interconnectedness between social and sexual communication practices, suggesting that friendships can play a significant role in navigating safety and risk in the online dating world (Wu & Ward, 2018).

The use of social media in romantic relationships has its own set of challenges (Hand et al., 2013). For instance, while online social networks like Facebook have gained immense popularity, they may also impact relationship satisfaction and intimacy. Intimacy has been found to mediate the relationship between online social network usage and overall relationship satisfaction. Moreover, research examining the construction of romantic relationships on social media platforms highlights the role of affordances in shaping these connections. In conclusion, online dating, and the use of digital platforms for romantic relationships have become prominent today. These technologies have reshaped communication practices, highlighted the interconnectedness between social and sexual spheres, posed challenges to relationship satisfaction and intimacy, and underscored the importance of friendships in navigating the online dating world. Additionally, certain studies have also investigated the prevalence of deceptive practices in online dating profiles and the strategies employed to enhance one's desirability in a digital context.

Although the potential value of online dating is still apparent, there is growing evidence that users are at risk. People may forge some or all dating information to attract each other or hide negative personal aspects. In addition, criminals are misusing online dating apps to target victims. Romance scams on online dating sites have been rising recently, and they can occasionally lead to major criminality. Some unethical operators may even hire fake daters to recommend it to their users to charge unreasonably high membership fees. Online dating sites are frequently used for suspected fraud and other illicit activities. Those risks may lead to trust issues in online dating apps (Chen et al., 2020).

There are many reasons why many millennials are skeptical about the safety of online dating. One of the reasons is the potential user may be concerned about security breaches, privacy, and the authenticity of profiles that hackers can access the information. Those who use dating services are twice as likely to be victims of a cybersecurity breach as those who do not. This is because criminals may use the applications to obtain unauthorized access to their devices or infect them with viruses. This might result in someone accessing or tampering with sensitive, personal information kept within, such as obtaining bank data or the home address via a smartphone (Natashia, 2020).

Next, the changing technology world presents new usability and accessibility designs. Thus, online dating app users can check out their matches from anywhere because of the accessibility of any dating app either on a phone or laptop. In addition, online dating apps save time effort, energy and money has driven up the popularity of online dating. Users do not have to leave their houses to connect with individuals all around the world. Also, users may assess people based on their appearance, traits, and other aspects, and then contact them via email (Natasha, 2022). The user interface, ease of navigation, and overall user experience all have a big

influence on adoption intention.

Lastly, catfishing can affect the adoption intention of online dating apps where users can hide behind the fake virtual image which the image can use a filter and can be edited. Almost 60% of people who use online dating apps admit to lying in their profile. The advance of technology allows anyone to create a profile and say whatever they want about themselves like adding a few inches to their height, to lying about their marital status, name, or even who they are altogether (Natashia, 2020).

This study investigated the aspects that influence millennials to use online dating apps using the UTAUT model, which comprises Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitation Condition (FC), and Trust (TR). Furthermore, this study would be advantageous for online dating app companies since the study of Trust (TR) is included in the research and might fill the gap in previous research and provide a fresh viewpoint to online dating app developers and marketers.

2. Literature Review

Performance expectancy measures a user's view of how effective a technology would be in enabling them to achieve their objectives. Hence, performance expectancy reflects the perceived functionality and usefulness associated with using online dating apps. Online dating offers flexibility and convenience and scans through a dozen profiles to connect users with a compatible match. Further, algorithms can generate suggestions for people within your preferred location, age limit or other factors depending on your filter options. Therefore, if the app fulfills or exceeds these expectations, it will improve user adoption and retention.
H1: Performance expectancy (PE) significantly influences the adoption intention towards online dating apps among millennials

Technology adoption is closely related to performance expectancy (Alghatrifi & Khalid, 2019). According to Chopdar et al. (2018), apps that perform a variety of helpful tasks will significantly improve the willingness to use mobile apps. Arora et al.(2020) also stated that the cumulative benefits provided by mobile applications will influence performance expectancy and increase people's incentive to use mobile apps. As a result, when the benefits provided by the applications were great, the adoption of mobile apps was significant. Users are more likely to embrace mobile apps that are useful in their daily lives (Hew et al., 2015). Individuals are expected to utilize online dating apps if they recognize the benefits and use of the apps.

Effort expectancy is concerned with the user's perception of how simple or difficult it is to use a technology. Online dating apps offer simple interfaces that allow users to swipe right to show interest or left to reject potential partners based on profile criteria. Signing up for and creating a profile is a straightforward guided procedure in which users provide basic information, add photos, and write a bio (Tze et al., 2023). Users of online dating services are notified of new matches, messages, and profile activity, which eases the pairing process.
H2: Effort expectancy (EE) significantly influences the adoption intention towards online dating apps among millennials

Individuals are more likely to adopt mobile technology if they believe it is user-friendly and the interface interaction is simple and easy to understand (Giovanis et al., 2018). According to Malik et al. (2017), if an app is easy to use, it will elicit pleasant sentiments and lead to pleasure. Users are more likely to adopt a mobile app that is less complicated and easy to use. Online dating applications must be well-designed to be easy to use and comprehend. According to Duan and Deng (2002), the less effort required to access an app, the more likely users are to adopt it. Individuals are more likely to utilize online dating apps if they believe the apps need less effort to work.

Social influences are the big factors impacting individuals' attitudes, behaviors, or decision-making processes. For example, the opinions and behavior of peers usually can easily influence an individual’s choice or decisions. This can have an impact on a variety of aspects such as purchasing decisions, and lifestyle choices including the adoption of online dating applications. Although modern society increasingly accepts online dating, online dating still receives critique from some societal members. In this regard, online dating app users are vulnerable

to the sentiments and critiques of societal members which influence the continuous adoption of online dating applications.

H3: Effort expectancy (EE) significantly influences the adoption intention towards online dating apps among millennials

As social effect shapes the mindsets of potential users, it directly affects intention behavior. When there is appropriate social support available to aid in the adoption of technology, people are more inclined to do so (Saprikis et al., 2021). considerable people, including friends, family, coworkers, and other well-known figures, have a considerable impact on the adoption of contact tracking apps, according to Duan and Deng (2021).

A person is more inclined to use the applications of those people's opinions the more significant their influence is. Arora et al. (2020) studied the social impact on how people were exposed to the newest apps and found that peer influence was important in predicting app uptake. Furthermore, as indicated by Malik et al. (2017), individuals' social networks have a considerable impact on the adoption of mobile apps. As a result, it is projected that social influence will influence millennials' intentions towards online dating apps.

H4: Facilitating conditions (FC) significantly influence the adoption intention towards online dating apps among millennials.

According to Venkatesh et al. (2016), the facilitating condition reflects individuals' judgments of the resources available to aid adoption, covering external and internal characteristics that influence individuals' adoption intentions. A user who has access to a desirable set of enabling needs will be more likely to adopt a technology. Users plan to use mobile apps if they have the necessary resources and support, such as online assistance, mobile devices, internet access, and so on (Hew et al., 2015).

Facilitating environments have a significant and favorable impact on the adoption behavior of social networking apps, as claimed by Puriwat and Tripopsakul (2021). Even though not every user has an endless mobile internet connection, the degree to which the functionality of mobile apps depends on constant online access may affect users' decision to download and utilize them (Vinnik, 2017). The facilitating condition is thought to have an impact on millennials' decision to use online dating applications.

In online dating apps, trust is crucial for interactions on the platform. Users need to have faith in the security, reliability and privacy of the technology, software, or platforms they use. Technology trust impacts adoption, usage, and long-term engagement. In addition, user's trust experiences affect their decision to adopt online dating apps in general. Thus, building and maintaining trust have been identified as crucial components for online dating apps to attract and retain users.

H5: Trust (TR) significantly influences the adoption intention towards online dating apps among millennials

According to Chao (2019), trust plays a crucial role in influencing people's intention to use internet technology. As the level of risk increases, individuals become less inclined to trust Internet technologies, as noted by Arfi et al. (2021). Additionally, trust is a key factor in determining subsequent actions between parties and establishing interpersonal and commercial relationships, as emphasized by Waseem et al. (2018).

The theory of perceived similarity, proposed by Liu & Xiong (2016), suggests that people with shared values and objectives tend to view each other favorably. In the context of internet use, users who perceive other internet users as like themselves are more likely to trust them, particularly in social apps. The lack of trust is anticipated to have adverse consequences on the user experience, leading to a reduction in consumers' willingness to adopt the apps.

3. Research Methodology

A precise analysis is conducted through the application of a quantitative research approach. This method involves the collection and evaluation of measurable, organized data, with the interpreted results being represented statistically (Goertzen, 2017). According to Goertzen (2017), a key objective is to provide both accurate and reliable measurements for subsequent statistical analysis. Given its capacity to yield results from a larger sample size, the quantitative approach is deemed suitable for the present research context. This study

uses a non-probability sampling method, known as the judgmental sampling method, to collect data. Researchers have been using a judgmental sampling method to study adoption intention using the UTAUT model (Daka & Phiri, 2019; Mahardika & Giantari, 2020; Rosnidah et al., 2018). Judgmental sampling design means that the samples are selected according to the judgment of the researcher (Etikan & Bala, 2017). Furthermore, judgmental sampling is cheap, easy, time-saving, and ideal for quantitative research design (Taherdoost, 2016). The researchers selected samples with a certain understanding of online dating apps in this research. The selected samples are aged from 18 years old to 30 years old, have at least heard about online dating apps before and never used or currently not using online dating apps. Furthermore, the respondents are expected to read and understand English as the questionnaire is conducted in English. The questionnaire is distributed to the respondents who meet the requirements. This sampling method allows researchers to reach the right audience.

4. Results

This section presents sets of results relating to the profile of respondents' experiences towards online dating applications, the characteristics of the total sample, and the comparison of participants regarding their experience based on demographic and geographic characteristics (gender, age, level of education, and region).

Profile of Respondents: Table 1 displays a summary of the characteristics of the total sample of respondents who participated in the study.

Table 1: Demographic and Geographic Information About Adoption of Dating Application

VARIABLE	FREQUENCY	PERCENTAGE
GENDER		
Males	34	30%
Females	79	70%
Total	**113**	**100%**
AGE		
19-30	113	100%
Total	**113**	**100%**
EDUCATION		
Certificate/Diploma/Degree	113	100%
Post-graduate qualification		
Total	**113**	**100%**
DATING APPLICATION USER		
Yes	78	70%
No	35	30%
Total	**113**	**100%**
FREQUENCY USE		
1-3 times	94	83%
4-6 times	15	13%
7-9 times	1	1%
More than 10 times	3	3%
Total	**113**	**100%**
DATING APPLICATION BRANDS		
Tinder	100	88.5%
Bumble	4	3.5%
Facebook Dating	4	3.5%
Others	5	4.5%
Total	**113**	**100%**

Descriptive Statistics: Tables 2, Table 3 and Table 4 display analyses of the significance of performance expectancy, effort expectancy, social influence, facilitating condition, trust, and adoption intention of online

dating applications. Multiple Regression analysis is used as it involves more than one variable to explain variance in the dependent variable (Sekaran and Bougie, 2013). In this study, multiple regression analysis was used to determine the factors influencing online dating adoption intention. The independent variables tested were performance expectancy, effort expectancy, social influences, facilitating conditions, and trust. The R-Square value represents the amount of variance explained in the dependent variable (adoption intention) by the predictors.

Table 2: Regression Analysis – Model Summary

Multiple Regression Analysis

R-Square Analysis

	R	R-Square	Adjusted R Square	Std. Error of the Estimate
1	0.818[a]	.669	.653	3.01819

Note. a. Predictors (Constant), Performance Expectancy, Effort Expectancy, Social Influences, Facilitating Conditions, Trust.

b. Dependent Variable: Adoption Intention

The table in this study shows that 66.9% of the dependent variable adoption intention can be explained by the independent variables (performance expectancy, effort expectancy, social influences, facilitating conditions, and trust), while 33.1% can be explained by other factors. The level of significance of the data collected was less than .001, indicating that the data was valid and could be accepted. The exhaustive number of questions per variable being tested could be a reason for the significance of the data.

Table 3: ANOVA Result

ANOVA

		Sum of Square	df	Mean Square	F	Sig
1	Regression	1965.815	5	393.163	43.160	<.001b
	Residual	974.716	107	9.109		
	Total	294.513	112			

Note. a. Dependent variable: Adoption Intention
B. Predictors (Constant), Performance Expectancy, Effort Expectancy, Social Influences, Facilitating Conditions, and Trus

Table 4: Coefficient Table

Coefficient table

		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		β	Std.Error	Beta		
1	(Constant)	1.710	1.253		1.365	.175
	Performance Expectancy	.359	.120	.319	3.000	0.03
	Effort Expectancy	-.300	.124	-.252	-2.428	.017
	Social Influences	.329	.085	.315	3.844	<0.01
	Facilitating Conditions	.070	.130	0.57	.541	.590
	Trust	.445	.092	.438	4.858	<0.01

Note. a. Dependent Variable: Adoption Intention

(*p<0.05; **p<0.001)

Based on the results from the study, only two independent variables, social influences, and trust, significantly contributed to online dating adoption intention with both having significant values of less than 0.01. The standardized coefficients (beta) showed that trust was the strongest variable that contributed to the dependent variable with a beta value of 0.445, followed by performance expectancy with a beta value of 0.359 and lastly social influences with a beta value of 0.329.

Table 5: Hypothesis Testing

NO	HYPOTHESIS	ß	SIG.	DECISION
HI	Performance expectancy (PE) significantly influences the adoption intention of online dating apps among millennials.	.319	0.03	**Accepted**
H2	Effort expectancy (EE) significantly influences the adoption intention of online dating apps among millennials.	-.252	.017	Not Accepted
H3	Social influence (SI) significantly influences the adoption intention of online dating apps among millennials.	.315	<0.01	**Accepted**
H4	Facilitating conditions (FC) significantly influence the adoption intention of online dating apps among millennials.	0.57	.590	Not Accepted
H5	Trust (TR) significantly influences the adoption intention towards online dating apps among millennials.	.438	<0.01	**Accepted**

Discussion

The results indicate that hypothesis 1 (H1) has a significant impact on Performance Expectancy (PE) on the adoption intention of online dating apps among millennials. The study reveals that users express concerns about the utility of dating apps in facilitating beneficial functions, such as broadening social networks, enhancing dating opportunities, and meeting dating needs. These findings align with previous research. Drawing from Saprikis et al. 's (2021) previous research, it has been found that users' inclination to engage with mobile apps is significantly impacted by their performance expectations, especially when they believe that using these apps will lead to favorable results.

A contradictory result emerges, indicating that Effort Expectancy (EE) for hypothesis 2 (H2) wields a significant influence on the adoption intention of online dating apps among millennials. This finding contradicts an earlier

study suggesting that effort expectancy could impact the intention to adopt technology (Abrahão, Moriguchi & Andrade, 2016). However, this research aligns with a prior study conducted by Alowayr (2022), which also found that EE did not exert a substantial impact on mobile technology adoption intentions. This is attributed to users generally being indifferent to the effort and time required to utilize technology. Consequently, it can be inferred that, despite the initial learning curve for millennials mastering the features of online dating apps, they are willing to adopt them due to the overall advantages these apps offer in enhancing their user experience.

As per the findings, hypothesis 3 (H3) plays a significant role in shaping the adoption intention of online dating apps among millennials in Social Influence (SI). The study reveals that individuals, especially peers, who hold significance in their lives, influence their decision to engage with online dating apps. These influential individuals impact the users' intentions by communicating the benefits of online dating apps and recommending their use. This observation is corroborated by the work of Peng and Cao (2017), emphasizing that social influence, particularly peer influence, becomes a more direct and influential factor in individuals becoming adopters of online dating apps.

The findings lead to the rejection of hypothesis 4 (H4), as there is no significant influence of Facilitating Conditions (FC) on the adoption intention of online dating apps among millennials. In contrast, a previous study by Puriwat and Tripopsakul (2021) demonstrated that facilitating conditions do impact user adoption behavior. The inconsistency in the results between this research and the earlier study may be attributed to the users' familiarity with mobile technology operations. With a reduced need for technological infrastructure and user support in adopting mobile technology, these factors are not primary concerns for most users, as highlighted in the study by Alowayr (2022).

Based on the results, hypothesis 5 (H5) has significantly impacted Trust (TR) for the adoption intention of online dating apps among millennials. This outcome aligns with a previous study conducted by Almaiah et al. (2020). The findings suggest that a lack of trust leads to greater hesitation in deciding to adopt mobile services. Consequently, as trust improves, young adults are less reluctant to adopt online dating apps, contributing to an increase in the user base for such applications.

5. Managerial Implications and Recommendations

Based on the insightful findings from our study among millennials, there are several key recommendations for dating app organizations to enhance their platforms and improve user adoption based on the identified factors of influence.

Firstly, recognizing the substantial impact of Performance Expectancy (PE) on the adoption intention of online dating apps, dating app organizations must highlight and emphasize the positive outcomes and advantages of their platforms. Users express concerns about the utility of dating apps, particularly in broadening social networks, enhancing dating opportunities, and meeting dating needs. Drawing from Saprikis et al.'s (2021) research, the organization should focus on communicating how the use of their app can lead to favorable results, aligning with users' performance expectations. Massive promotional activities such as online and offline campaigns can be done to attract the public to get interested in and use the application.

Secondly, in contrast to Effort Expectancy (EE) being a less influential factor, dating app organizations should still prioritize efforts to make their platforms user-friendly and minimize any potential learning curves. While users may generally be indifferent to the effort and time required for technology adoption, optimizing the user experience by simplifying app features and providing clear guidance can contribute to a more seamless adoption process. This is true with the application of Tinder, in which it surpassed its competitors such as OkCupid by maximizing the mobile platform when it was introduced. According to the digital learning solution company, Moloko, in one of its blogs in 2021, with the growth of mobile marketing, combined with local strategies, Tinder has reaped the benefits of targeted promotions to different users with different needs and different learning curves.

Additionally, given the significant role of Social Influence (SI) in shaping adoption intentions, dating app

organizations should actively encourage peer recommendations and endorsements. Leveraging the influence of individuals, especially peers, who hold significance in users' lives can positively impact their decision to engage with the app. Strategies may include referral programs, social sharing features, and testimonials from satisfied users, aligning with Peng and Cao's (2017) emphasis on the direct influence of social peers in driving app adoption. Social impact has a direct impact on intention behavior because it influences potential users' attitudes. Individuals' intentions to adopt technology are higher when there is reasonable social assistance for doing so (Saprikis et al., 2021). Dating app organizations should emphasize viral marketing such as using social influencers and traditional word-of-mouth communication to gain the interest of potential users.

Despite the rejection of Hypothesis 4 (H4) regarding the significant influence of Facilitating Conditions (FC), dating app organizations should not neglect the importance of providing a reliable and efficient technological infrastructure. While millennials may be familiar with mobile technology operations, ensuring a smooth and supportive user experience remains vital. The organization can focus on refining app functionalities, ensuring prompt customer support, and adapting to emerging technological trends. According to Bumble's chief executive, Lidiane Jones, the company would be revamping the app to appeal to more users, particularly younger ones, by adding "personalization and flexibility" to the experience (Moreno, 2024). This is done to make dating apps more interesting, easily accessible, and cheaper in subscription rates especially to the younger generations.

Lastly, recognizing the pivotal role of Trust (TR) in adoption intentions, dating app organizations should prioritize building and maintaining trust among users. Communication and transparency regarding data security, privacy policies, and overall reliability are essential. Learning from Almaiah et al. 's (2020) study, addressing concerns related to trust can reduce hesitation among young adults, ultimately contributing to the growth of the user base. According to Time Magazine, dating apps such as Bumble, Hinge, and Tinder offer background checks, especially for potential users who have criminal records. Further dating apps such as Bumble have encouraged users to do their background checks for potential matches (Burga, 2023). Data protection and privacy must be emphasized by the dating app organization and thorough security measures must be implemented to protect each data and information. Ashley Madison, one of the dating apps available in the market, learned the hard way in 2015 when the site was hacked and around 2500 users' data leaked online. This has led to USD500 million lawsuits and mental anguish among its users.

Conclusion

In summary, this discussion has highlighted the key findings based on the results of hypothesis testing. The presentation of theoretical and managerial implications aims to offer enhanced insights and recommendations for future practitioners and policymakers. Additionally, the study also addresses its limitations and provides recommendations, offering guidance for future researchers seeking to enhance the quality of their research. By emphasizing positive outcomes, optimizing user-friendliness, leveraging social influence, maintaining a reliable infrastructure, and prioritizing trust, dating app organizations can effectively enhance their platforms and foster increased adoption among millennials.

A significant challenge arose from the constrained time frame available for conducting the research, which hindered the depth and breadth of data collection and analysis. This constraint restricted the exploration of certain aspects of the research topic in greater detail, potentially impacting the comprehensiveness of the findings. Inadequate resources, insufficient financial resources, manpower, and access to specialized tools and technology posed additional limitations. Insufficient financial resources hindered extensive data collection efforts and the utilization of advanced analytical methods. Similarly, limitations in manpower may have slowed down data collection and analysis processes, potentially affecting the thoroughness of the research outcomes. Furthermore, limited access to resources such as specific databases, archives, or equipment constrained the scope of the study. Certain data sources or research methods may have been inaccessible due to these limitations, which could have influenced the comprehensiveness and robustness of the findings.

Despite these challenges, efforts were made to mitigate their impact through careful planning, prioritization, and adaptation of research methods. Strategies such as focusing on key research objectives, maximizing efficiency in data collection and analysis processes, and optimizing available resources were employed to address these limitations. However, it is important to acknowledge that these constraints may have influenced

the study's outcomes and should be considered when interpreting the findings. Future research endeavors in this area could benefit from allocating adequate time and resources to ensure a more comprehensive and rigorous investigation of the research topic.

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The Impact of Consumer Ethics on Intention to Purchase Counterfeit Fashion Products

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Abstract: The issue of counterfeiting has long plagued many industries including fashion, automotive, electronics, and pharmaceutical. Companies face various challenges when it comes to dealing with the issue of counterfeiting, which results in financial implications, loss of brand reputation, and many more. From a consumer perspective, counterfeit is the cheaper option in a market where consumers are spoilt for choice. Advancements in technology have helped manufacturers of counterfeit to increase the similarity and to a certain extent the quality of their products to their genuine counterparts. Thus, the demand for counterfeit products in general kept rising over the years. This research looks at the influence of perceived behavioral control and consumer ethics in influencing consumer intention to purchase counterfeit fashion products. A partial least squares (PLS) approach to structural equation modeling (SEM) was used to analyze the data. Findings showed that there is a negative relationship between perceived behavioral control and intention and a positive relationship between consumer ethics and intention.

Keywords: *Counterfeit fashion, Consumer ethics, Intention, Perceived behavioral control*

1. Introduction and Background

Counterfeiting is the act of making the exact copy of the genuine product, to make it appear as if it is the original product. The early case of counterfeiting can be traced back to the Roman Empire, where wine trademarks were duplicated to make the product appear expensive (Philips, 2007). In Malaysia, based on the statistics provided by the Ministry of Domestic Trade and Cost of Living (MDTCL), as of September 2022, there were 146 cases of counterfeit seizures of fashion-related products amounting to RM3,416,039 (Ministry of Domestic Trade and Cost of Living, 2022).

Over the past few decades, the production and consumption of counterfeit items have significantly increased and globalization has influenced the expansion of the consumption pattern. Numerous firms and brands can expand into new markets, hence intensifying the aspiration to possess global brands. Global and renowned companies may command higher prices compared to local ones due to their established reputation in the market. These and other similar factors are the primary determinants of counterfeit goods sales and purchases. However, this doesn't look down on the impact of counterfeiting on local brands as well. It is well documented that a lot of Malaysian fashion brands have also suffered and are affected by counterfeiting.

From the consumer perspective, the purchase and consumption of counterfeit goods extends beyond financial reasons. Various studies have confirmed that price is regarded as one of the main reasons why consumers resort to counterfeit options (Jiang & Cova, 2012; Li et al., 2018; Ndofirepi et al., 2022; Wee et al., 1995). However, the purpose of this research is to look beyond price factors and to investigate the role of ethics in influencing the intention to purchase counterfeit fashion products. While public awareness and interest in ethical consumerism in increasing and consumers' attitudes towards it are largely favorable, there are still gaps in what consumers think is right, what they intend and what they do to support environmental and societal improvements with their available budget (Carrington et al., 2010).

Consumers tend to believe that they are ethical and are willing to pay higher prices for products that are made by socially responsible companies. According to Lee (2024), consumers have affirmed their will by participating in boycotts, whereby they avoid buying products and/or services made by companies that have done business immorally. However, despite many companies being involved in unethical practices such as sweatshops, a lot of global fast fashion brand continues to experience increased sales record (Fast Retailing, 2020). This perhaps indicates that consumers might feel that they are ethical only to a certain extent.

2. Literature Review

Behavioral intention, in essence, pertains to an individual's deliberate effort to engage in a certain activity, such as the desire to buy counterfeit fashion items. Moreover, the likelihood of carrying out such an action rises in proportion to the level of intention to act (Ajzen, 1991). Consumers' behavioral intention is a crucial notion for market researchers as it reflects their anticipated future actions. In this study, intention is defined as the conscious and purposeful act of buyers to buy counterfeit items.

The Theory of Planned Behaviour (TPB) has broad applicability and has been used to predict a wide range of behaviors. Past research can be found across various disciplines such as health, information technology, psychology, social sciences, tourism and hospitality management (Ulker-Demirel & Ciftci, 2020).

This study investigates the factors that are within the consumer's control and their perspective toward ethical issues. Sun (2020) Extends the TPB by way of adding another variable in the form of moral identity, and level of confidence as moderator, to increase explanatory and predictive ability in understanding consumer ethical decisions. One of the reasons why ethical consumers do not always make ethical decisions is due to homo economicus (Lee, 2024). Homo economicus refers to consumers who continue to purchase products from "controversial" brands as long as it benefits them (Alger & Weibull, 2013; Bègue, 2016; Skitka, 2009).

There is a difference in terms of outcome and how a consumer would feel if they have purchased either from ethical or unethical companies. Hassan et al. (2013) mentioned that consumers may feel guilty when they buy and use unethical companies' products as they feel that they are indirectly participating in unethical activities. On the other hand, according to Antonetti and Maklan (2014), ethical consumption could lead to a positive emotion such as pride. Hence, any effort to encourage consumers to behave morally could contribute to society's and individuals' well-being.

Intention

In essence, behavioral intention refers to a deliberate attempt by an individual in trying to carry out certain behavior, which in this study, is specific to the intention to purchase counterfeit fashion products. Intention signals to a certain extent the awareness and willingness of consumers to engage in actual behavior. Intentions are assumed to capture the motivational factors that influence behavior, and are considered indicators of how hard people are willing to try; and how much effort they are planning to exert, to perform the behavior (Ajzen, 1991).

The TPB posits that for actual behavior to take place, one must have the intention which is influenced by factors such as attitude, subjective norm and perceived behavioral control. From a marketing perspective, intention is a very significant element as it represents the estimated future behavior (Ajzen, 1985; Fishbein & Ajzen, 1975). This signals a certain element of willingness to engage in a particular behavior, and marketers will be able to act upon these "signals" to better understand their customers and provide a much more personalized strategy or tactics moving forward. Strong intentions are a better predictor of behavior, which reduces the intention-behavior gap (Conner & Norman, 2022). These intentions are more stable over time and less susceptible to change, which can influence information processing about the behavior.

In the age of digital marketing, understanding behavior and different levels of intentions are becoming much more important. High-quality content, message clarity, and belief in the message significantly enhance behavior intention, especially when mediated by empathy (Arora & Sagar, 2023).

Perceived behavioral control

Perceived behavior refers to the degree of control that an individual perceives over performing the behavior. According to Ajzen (2002), perceived behavioral control (PBC) is the extent to which a person feels able to engage in the behavior; it covers two aspects, how much a person has control over behavior, and how confident a person feels about being able to perform or not perform a behavior. Moreover, PBC can account for considerable variance in behavioral intention and actions, provided that when people believe they have more resources such as time, money and skills, their perceptions of control are high and hence their behavioral intentions increase (Ajzen, 2002).

PBC is a broad concept that pertains to customers' beliefs of whether they can control their actions. It represents the views on the availability of resources and opportunities needed to support certain behaviors, as well as an individual's self-assurance in their capacity to engage in such behaviors (Ajzen, 1985, 1991). PBC is well recognized as a crucial factor influencing behavior in several areas.

In situations where it is less financially rewarding for individuals, PBC still is a powerful motivator for human behavior (Reis et al., 2023). Furthermore, PBC has also been found to have a positive association with ethical consumption behaviors, particularly in slow fashion consumption, which indicates that consumers who feel they have control over their actions are more likely to engage in sustainable practices (Lira & Costa, 2022). Hence, the following hypothesis is developed:
H1: There is a significant relationship between perceived behavioral control and intention.

Consumer ethics
Every culture has its own set of beliefs, attitudes, and values that guide their lives. Ethics are also shaped by culture. Ethics is a word derived from the Greek word *ethos,* which means "customary" or "conventional" (DesJardins, 2009). Usually, these customary values are connected to a particular culture's religious worldview. In terms of definition, ethics may be defined as "inquiry into the nature and grounds of morality where the term morality is taken to mean moral judgments, standards, and rules of conduct" (Taylor, 1975). The study of ethics in marketing has evolved from the widest scope possible to a more narrowed micro approach.

Early developments and studies regarding marketing ethics theories focused more on ethical practices within areas such as marketing research, marketing management, sales, advertising, and social marketing (Vitell et al., 2007). The consumer ethics scale designed by Muncy and Vitell (1992) Serves the sole purpose of measuring the level of ethics of the final consumer. The definition of consumer ethics according to Muncy and Vitell (1992) is, "the moral principles and standards that guide the behavior of individuals or groups as they obtain, use and dispose of goods and services".

Different consumers from different countries might react differently towards what they deem to be ethical or non-ethical. These are also depending on the situation and the environment that they are in. For example, a consumer might not feel that downloading illegal software or music from the internet is the same as they would drinking a can of soda without paying for it at a supermarket, although both do not incur any "costs" to the consumer. (Muncy & Vitell, 1992). Ultimately, in the same study, four dimensions were identified as being part of the consumer ethics scale; (1) benefits incurred from actively engaging in perceived illegal activities, (2) benefits incurred from passively engaging in questionable activities, (3) benefits incurred from actively engaging in questionable or deceptive activities that are perceived as legal, and (4) behaviours perceived as involving "no harm/no foul" activities.

Following the previous study, Vitell (2003) Found that consumers tended to believe that benefiting actively from an illegal activity was more unethical than benefiting passively. For the first dimension, consumers might reason that if they did not initiate the activity, then it was not wrong (unethical). The second dimension signifies a situation where consumers passively benefit themselves by capitalizing on the seller's mistake. The third dimension reflects actions in which consumers are actively involved in unethical but are not necessarily illegal. Finally, in the fourth dimension, activities were not perceived as unethical at all (no harm/no foul). Most of these cases tended to be activities that involved pirating intellectual property, such as software, tapes, or movies. Thus, the following hypothesis is developed:
H2: There is a significant relationship between consumer ethics and intention.

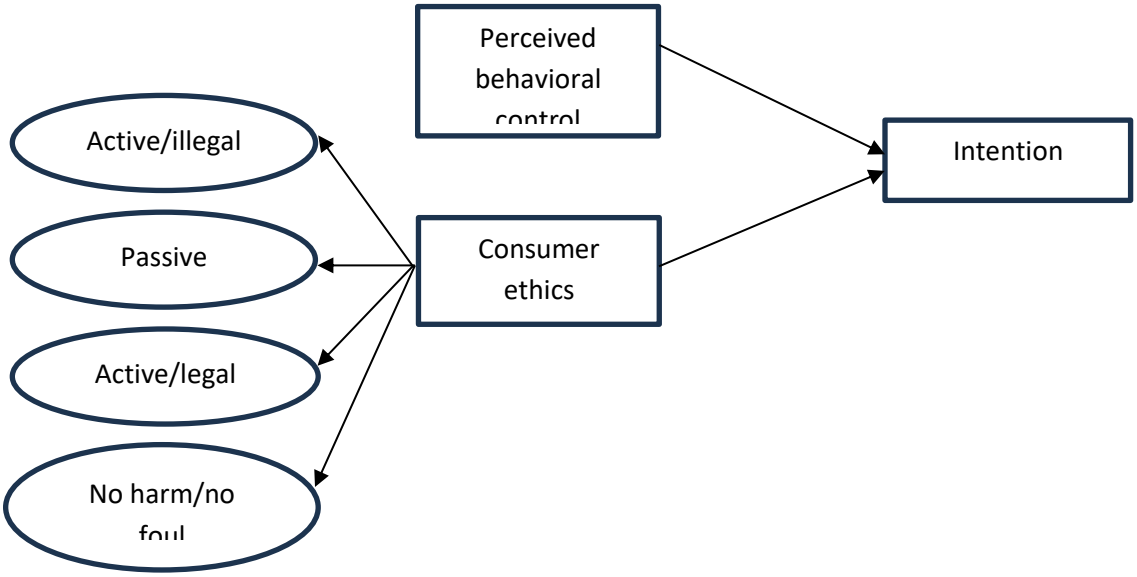
3. Methodology

Data was collected via a self-administered questionnaire which uses established items from previous studies (de Matos et al., 2007; Hsu & Shiue, 2008; Kim & Karpova, 2009; Riquelme et al., 2012; Vitell & Muncy, 2005). All the items were measured using a five-point Likert scale. The questionnaires were distributed at both private and government organizations, as well as both private and public higher learning institutions. Snowball sampling techniques were used where the method yields a study sample through referrals made among people who share or know of others who possess some characteristics that are of research interest.

In this study, respondents must be 18 years old and above because, in Malaysia, formal education is until one reaches the age of 17. After that, he/she will either join the workforce or continue their studies at a higher learning institution. Hence, it is assumed that those aged 18 years old and above have sound knowledge and the ability to make their own purchasing decision. In Malaysia, formal education which includes both primary and secondary levels, is until one reaches 17 to 18 years old, and the legal age for voting according to the Election Commission of Malaysia is 18 years old.

The partial least square (PLS) approach to structural equation modeling (SEM) was performed due to its capability to generate more reliable estimates of the structural model and its capacity to handle latent variables in situations where normalcy assumptions are violated (Hair et al., 2014). Moreover, it also results in greater theoretical simplicity and decreases the intricacy of the model.

Figure 1: Conceptual Framework



4. Results

Table 1 presents a concise overview of the background of all the participants in the study, categorized according to their demographic parameters.

Table 1: Respondents' Profile

VARIABLE	FREQUENCY	PERCENTAGE
GENDER		
Males	176	43.1%
Females	232	56.9%
AGE		
18-25	211	51.7%
26-30	68	16.7%
31-40	111	27.2%
>41	18	4.4%
EDUCATION		
SPM/STPM	69	16.9%
Diploma	129	31.6%
Degree	186	45.6%
Professional	5	1.2%
Others	19	4.7%
OCCUPATION		
Government	112	27.5%

Private sector	83	20.3%
Self-employed	6	1.5%
Student	203	49.8%
Unemployed	4	0.7%
INCOME		
Less than RM1,000	198	48.5%
RM1,001 – RM3,000	87	21.3%
RM3,001 – RM5,000	68	16.7%
RM5,001 – RM7,000	43	10.5%
More than RM7,000	12	2.9%
RACE		
Malay	354	86.6%
Chinese	18	4.4%
Indian	24	5.9%
Others	12	2.9%

All respondents are aged 18 years old and above, with an age range between 18-25 being the majority of respondents with 211 (51.7%), followed by 26-30 years old with 111 (27.2%). The majority of the respondents possess a bachelor's degree (45.6%) and a diploma (31.6%). On the income basis, the majority had a monthly income of less than RM1,000 (48.5%) which may be due to the majority of the respondents being comprised of students. This is followed by RM1, 001 – RM3, 000 (21.3%), RM3, 001 – RM5, 000 (16.7%), RM5, 001 – RM7, 000 (10.5%), and lastly more than RM7, 000 (2.9%).

On the other hand, Table 2 presents the respondents' past encounters with counterfeit purchases and the specific types of things they had bought. The overall response shows a huge percentage for fashion-related products. More than half of the respondents (68.9%) have purchased counterfeit-related products.

Table 2: Respondents' Counterfeit Purchase Experience

PREVIOUS PURCHASE	FREQUENCIES	PERCENTAGE
Experience		
Yes	281	68.9
No	127	31.1
Product		
Clothing	192	29
Shoes	152	23
Sunglasses	98	14.8
Watch	104	15.7
Handbag	92	13.9
Others	24	3.6

Consumer ethics was conceptualized as higher-order components (HOC), which are measured based on the first-order construct (lower-order components or LOC). In theory, the LOCs will serve as the basis for the HOC dimension, which, in the context of this study, includes four first-order constructs, active/illegal, passive, active/legal, and no harm/no foul. To conduct the study, a method known as the repeated indicator technique was employed, as described by Lohmoller (1989) and Wold (1982). All the LOCs have a comparable amount of indications, except the active/illegal dimension. It is crucial to guarantee that the connections between the Higher Order Constructs (HOCs) and Lower Order Constructs (LOCs) are established to minimize bias, as stated by Becker et al. (2012).

Convergent validity: This is the degree to which each indicator represents a converging idea about indicators measuring other constructs. The Average Variance Extracted (AVE) is a measure of the extent to which a latent concept accounts for the variability in its indicators (Hair et al., 2017). To attain sufficient convergent validity, each concept should explain at least 50% of the variation in the assigned indicators (AVE ≥ 0.50) (Fornell & Larcker, 1981; J. F. Hair et al., 2017). According to Table 3, all item loadings exceed 0.6, meeting the minimal requirement for both AVE and CR.

Table 3: Convergent Validity for Consumer Ethics

DIMENSION	INDICATORS	ITEMS LOADINGS	FACTOR LOADINGS	AVE	CR
Consumer Ethics				0.716	0.908
Active/Illegal	AI1	0.793	0.871	0.659	0.906
	AI2	0.786			
	AI3	0.843			
	AI4	0.823			
	AI5	0.813			
Passive	PAS1	0.828	0.919	0.704	0.905
	PAS2	0.856			
	PAS3	0.810			
	PAS4	0.860			
Active/Legal	AL1	0.861	0.921	0.748	0.922
	AL2	0.859			
	AL3	0.892			
	AL4	0.847			
No harm/No foul	NH1	0.832	0.643	0.661	0.885
	NH2	0.873			
	NH3	0.872			
	NH4	0.654			

Discriminant validity: This refers to the extent to which indicators vary across constructs or measure different ideas by analyzing the correlations between the measures of possibly overlapping (Ramayah et al., 2018).The findings in Table 4 display the AVE square root estimations, indicating that each value surpasses the correlations between the dimensions. This demonstrates the attainment of discriminant validity. This enables a more in-depth examination of the connections between more complex concepts.

Table 4: Discriminant Validity for Consumer Ethics

DIMENSION	ACTIVE/ILLEGAL	PASSIVE	ACTIVE/LEGAL	NO HARM/NO FOUL
Active/Illegal	0.812			
Passive	0.719	0.865		
Active/Legal	0.332	0.566	0.813	
No harm/No foul	0.778	0.796	0.478	0.839

Table 5: Reliability and Convergent Validity

CONSTRUCTS	ITEM	LOADINGS	CR	AVE
Intention	INT1	0.851	0.875	0.7
	INT2	0.777		
	INT3	0.880		
Perceived Behavioural Contol	PBC1	0.808	0.863	0.678
	PBC2	0.855		
	PBC3	0.806		

Table 5 summarizes the reliability and convergent validity of intention and PBC. The measurement value of the constructs has adequate levels of convergent validity meeting the minimum level of 0.5 for AVE and 0.7 for CR (Hulland, 1999)

Table 6: Hypothesis Testing

RELATIONSHIP	STD BETA	T-VALUE	P VALUE	DECISION
PBC -> Int	-0.022	0.497	0.619	Not supported
CE -> Int	-0.121	2.837	0.005*	Supported

*Significant at $p<0.05$

From Table 6 above, the relationship between PBC and intention, the results showed that there is no significant relationship, hence rejecting the initial hypothesis. This differs from past studies which have found that PBC has a significant positive relationship with intention (Lee, 2009; Liao et al., 2010; Mohamed Omar et al., 2012; Yoon, 2011). Furthermore, the relationship between consumer ethics and intention shows a significant negative relationship with a *p-value* of 0.005 and a *t-value* of 2.837.

Discussion

This study has found that perceived behavioral control has no significant influence on consumer intention toward the purchase of counterfeited fashion products. The reason for this is most of the respondents feel that counterfeit fashion products can be easily purchased in the market hence meaning they had the power to purchase counterfeit fashion products without having to have a deep knowledge regarding them as opposed to something much more technical such as software adoption. The value of the path coefficient (β = -.0.022) suggests that there may be a negative relationship between perceived behavioral control and intention to purchase counterfeit fashion products.

The study found that consumer ethics has a significant influence on the intention to purchase counterfeit fashion products. Based on Table 6, the value of the path coefficient (β = -0.121) suggests that there is indeed a negative relationship. It is significant at a one percent confidence level ($p<0.01$), with a *p-value* of 0.005. The results also showed that the *t* value of 2.837 is more than the critical value of 2.57, supporting that there is a negative relationship between consumer ethics and intention to purchase counterfeit fashion products.

5. Managerial Implications and Recommendations

This study offers valuable information especially with regards to consumer behavior when faced with ethical decision making. The context of this study was to look into counterfeit fashion products, taking into consideration factors such as intention, perceived behavioral control, and consumer ethics. It is interesting to note that, the purchase or consumption of counterfeit may not necessarily be due to financial reasons, it may also be due to the appeal that it has.

The findings also show the importance of information and educating consumers about the negative impact of counterfeiting. It is no longer sufficient to just create awareness campaigns and programs, government agencies, authorities, and brands must work together to ensure that maximum effort is put it in terms of combating counterfeiting, as well as prioritizing educating consumers through various means available.

The fight against counterfeit requires effort from not only the manufacturers, but also the whole ecosystem which consists of brand owners, suppliers, logistics partners, and consumers. Thus, awareness, integrity, and ethical values go hand in hand in helping to reduce, and ultimately eliminate the threat of counterfeiting.

Conclusion

The conceptualization of consumer ethics as higher-order modeling (HOM) enables researchers to incorporate a broader range of constructs represented by several dimensions in partial least squares structural equation modeling (PLS-SEM). This is achieved by summarizing the latent organizational constructs (LOCs) into a single multidimensional higher-order construct (HOC). The inclusion of both PBC and consumer ethics as antecedents to intention is aimed at examining two distinct aspects of factors that influence intention. PBC refers to consumers who make their own decisions based on their beliefs and abilities. On the other hand, consumers must consider a variety of elements in ethics, which vary from country to country due to the subjectivity and cultural specificity of ethics.

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Factors Influencing The Usage of Stress Relief Applications: From The Psychological Perspective

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Abstract: Stress remains one of the most difficult challenges in responding to various situations. It elicits negative thoughts and feelings in the person. Counseling, training, exercise, and other methods effectively reduce stress. However, with the advancement of technology, different approaches to dealing with it have emerged. One of the types of digital health applications was stress relief applications. This application was starting to become famous as an alternative to help individuals manage their stress levels. Numerous stress-management or stress-relief applications are available for smartphones and tablets. These applications include a variety of stress-reduction techniques, including meditation, mindfulness breathing, cognitive behavioral therapy, and relaxation techniques**.** This review paper explores the psychological factors influencing the usage of stress relief applications. In this review paper, researchers focused on perceived stress, motivation for self-care, and cognitive engagement. Understanding these psychological factors can help the individual experiencing high stress levels to utilize the stress relief application. Besides, for the application developers, it gives the idea to create compelling digital tools that cater to users' specific needs and preferences, ultimately promoting better stress management and overall well-being.

Keywords: *Stress-Relief Application, Psychological Factors, Perceived Stress, Motivation for Self-Care, Cognitive Engagement and Review Paper*

1. Introduction

It is a common issue, and it is physical stress, which can hurt their academic or work performance as well as their mental health. Various research is covered on experience with physical stress (Albdour, Hong, & Jenuwine, 2024; Paler, Claret, Poblete, Alarde, & Mamauag, 2019). In 2018, Wołowska and Górska recognized that primary school students often experience headaches and stomach discomfort as physical manifestations of stress. The situation is the same as that of college students, who also experience the physical symptoms of stress reaction (Paler et al., 2019).

As the era moves forward, there are a lot of alternatives to help individuals who are experiencing stress to minimize the impact of stress. One of the alternatives is the stress-relief applications. Stress relief applications can be defined as software programs or smartphone applications with the function of helping people manage and minimize stress levels (Shamsi & Chaube, 2024). In some of the applications, it is designated with psychological principles and practices that may help users manage their stress situation. For instance, the Calm Sense application has several elements such as meditation, breathing exercises, and personalized activities to ensure the user can cope with their stress (Shamsi & Chaube, 2024).

Interestingly, some related applications like Calm Sense have specific groups, such as healthcare workers or obese people. The functions of the applications vary with occupational stress (Alkhawaldeh, Mukhtar, Anshasi, Amer, & Soh, 2020) and managing weight loss, which concurrently manages stress as well (Gurgevich & Nicolai, 2014).

2. Literature Review

Several perspectives might be reviewed to describe the factors affecting the usage of stress relief applications. For instance, the environmental and the social influence factors. In this study, the researcher reviews the factors based on contributors of psychological factors. As this is a review paper, it is essential to have focus and details about the topic to be discussed. Psychological factors, including perceived stress, motivation for self-care, and cognitive engagement, were discussed and explained in detail. However, these factors might have

positive and negative impacts on the usage based on the application features, user engagement, and the individual perspective.

Psychological factors: significantly influence the use of stress relief or mental health applications, as they directly affect users' motivation, attitudes, and propensity to engage with such digital tools. Several psychological factors influence the application of stress relief. These factors include perceived stress, motivation for care, and cognitive engagement. Indirectly, the factors were interrelated with the individual well-being and their applications' effectiveness to suit their condition. Understanding these factors may help application developers create practical digital applications that cater to the users' specializations and preferences. The following is a discussion on elements of psychological factors: perceived stress, motivation for care, and cognitive engagement.

Perceived stress: refers to the subjective experience of stress that arises from an individual's appraisal of environmental threats to their well-being. It encompasses emotional, psychological, and physiological responses to perceived challenges, varying significantly among individuals based on their unique contexts and experiences. Commonly perceived stress is triggered by the instability of mental and physical health, which includes emotional stress (Balieva et al., 2022; Chan et al., 2023), chronic mental health conditions (Pop-Jordanova et al., 2013), and environmental factors (Lehman et al., 2012). One of the evaluations to check on the perceived stress level was using the Perceived Stress Scale (PSS) (Yılmaz Koğar & Koğar, 2024). The evaluation of PSS includes terms of individual prediction, control, and whether there is an overload feeling in their daily routine.

The utilization of stress relief applications is considerably affected by perceived stress, as these digital solutions gain recognition for their stress management capabilities. Several elements, such as the precision of stress quantification, individual personality characteristics, and the application's user interface, play crucial roles in determining the efficacy and user interaction with these tools.

A recent study commonly interrelated perceived stress with the use of stress relief applications, also known as mental health applications. (Nogueira-Leite et al., 2024) Study findings perceived stress significantly positively towards using digital mental health applications or self-relief applications among academicians in Porto. Their study found that the more individuals perceived stress or experienced high stress levels, the more intention they had to use the stress relief applications.

In contrast to the findings of Jaworski et al. (2023), the research indicates that although mental health issues are common among veterans in the United States, the utilization of mental health self-management applications remains notably low. Therefore, Jaworski et al. (2023) suggested exploring the factors influencing the use of stress relief applications with indicators such as barriers to access and awareness of the application. In addition, this study supported the study by Hoffman et al. (2019), which emphasized the need for training to use the application among healthcare providers as a tool to help patient care.

Much research has demonstrated that regular utilization of these applications can result in notable decreases in perceived stress, anxiety, and even depressive symptoms. Applications offering guided meditation, breathing techniques, or mood monitoring typically assist users in becoming more cognisant of their stress levels and managing them more effectively (Alhasani, Oyebode, Baghaei, Mulchandani, & Orji, 2022; Apolinário, Fritsche, Breil, Drüge & Hennemann, 2019; Kashyap, Liddell, Keegan, Thomson & Nickerson, 2020). Research indicates that applications designed for stress alleviation can positively influence psychological aspects associated with reducing stress levels.

Based on studies that have been done show that perceived stress appears to be a significant factor influencing the utilization of stress relief applications; the relationship is not straightforward as individuals seek methods to mitigate their symptoms. Additional elements such as knowledge, accessibility, and healthcare provider involvement also play crucial roles in these digital tools' uptake and continued use. To enhance the adoption of self-help applications, it is imperative to address these multidimensional aspects, ensuring that the applications are not only productive in stress management but also readily accessible and well-integrated into healthcare protocols (Hoffman et al., 2019; Jaworski et al., 2023; Linardon et al., 2024; Nogueira-Leite et al., 2024).

Motivation for Self-Care: Another psychological element that plays a crucial role in self-care motivation. A study by Holtz et al. (2023) recently showed that young adults who use stress relief applications based on their effort and features managed to reduce stress more than physical meetings with mental health care professionals. Their studies show that the impact of their motivation for self-care was huge on individual stress level management. Other than that, a study by Apolinário-Hagen et al. (2019) results in positive attitudes toward digital health applications such as stress relief applications used for stress management. They are significant usefulness of acceptance, suggesting that positive attitudes may predict the acceptance of stress management applications comparably to more intricate outcome beliefs (Apolinário-Hagen et al., 2019). The behavioral changes by motivating users to embrace stress-alleviating practices. Functionalities like alerts, achievement monitoring, and tailored guidance assist users in incorporating stress management techniques into their everyday lives. With consistent use, this can result in long-term enhancements in stress handling and general wellness (Bakker, Kazantzis, Rickwood, & Rickard, 2016).

Moreover, the attitude of individuals impacts their motivation for self-care. A study by (Kamaruzaman, Fikry, & Hussein, 2023) Indicated that attitude significantly influenced the intention to use mobile health applications as one of the significant aspects is the attitude towards using mobile health applications such as stress relief applications.

However, prior research has also shown contradictory results. Lau et al. (2020) described that there is a gap between users' perceived usefulness and the lack of scientific validation for numerous applications. Their research highlights a possible disconnect between consumer behavior and evidence-based practice. The motivation for self-care influencing the use of stress relief applications includes the perceived effectiveness and usefulness of the application and positive views of digital applications as a stress coping strategy. There is limited scientific evidence supporting the efficacy of many aspects. Such applications highlight the need for more rigorous research and possibly improved consumer guidance in selecting evidence-based options Apolinário-Hagen et al. (2019); Holtz et al. (2023); Lau et al. (2020)

Cognitive engagement. Another element of psychological factors is cognitive engagement toward stress relief applications. Cognitive engagement significantly impacts the use of stress relief applications. The effect of user interaction and the benefits derived from these digital tools are undeniable. The utilization of cognitive-behavioral therapy (CBT) principles in mobile health applications has demonstrated enhancement in mental health outcomes, especially in alleviating anxiety and stress. This relationship is influenced by factors including user characteristics, emotional regulation strategies, and psychological awareness. Cognitive-behavioral therapy was introduced by Aaron T. Beck in the 1960s, focusing on mental health. CBT was developed to help individuals identify and change negative patterns of thought and behavior that influence stress emotion. The function of CBT was expanding significantly to treat individuals with mental health issues, such as depression, anxiety, and stress.

There is a study that supports the cognitive-behavioral mental health application revealed that increased engagement, especially among younger users exhibiting more severe symptoms, resulted in enhanced mental health outcomes. This indicates that cognitive engagement is essential for alleviating symptoms, particularly in digital interventions like stress relief applications aimed at young adults Danilo, Moggia., Wolfgang, Lutz., Nikolaos, Kazantzis., Brian, S., Schwartz., David, Bakker (2023). A randomized controlled trial indicated that a smartphone-based CBT application significantly alleviated stress and anxiety in the workplace, underscoring the significance of user engagement in attaining these results (Hwang et al., 2022).

Cognitive emotion regulation (ER) strategies, including cognitive reappraisal, are crucial for stress management. These strategies depend on cognitive control systems that may be compromised by acute stress, thereby diminishing the effectiveness of stress relief interventions. Successful emotion regulation can bolster resilience to stress, indicating that cognitive involvement in these strategies is essential for effective stress management (Langer, Jentsch & Wolf, 2023). This indicator reflects the study by Kosasih et al. 2022 that psychological mindedness, or the ability to reflect on psychological processes, mediates the relationship between app engagement and anxiety reduction. Users who are more psychologically minded tend to engage more deeply with CBT-based activities, leading to better mental health outcomes.

There are also cognitive resilience interventions that reduce anxiety, and they may also decrease anxiety-driven behaviors, such as political engagement. This trade-off highlights the complex interplay between cognitive engagement, stress relief, and broader behavioral outcomes. (Hwang et al., 2022). Thus, cognitive engagement is a critical factor in the success of stress relief applications, influencing symptom reduction, emotional regulation, and overall mental health improvements. However, the relationship between cognitive engagement and behavioral outcomes can be complex, as seen in the potential reduction of anxiety-driven activities. This complexity underscores the need for personalized and adaptive digital interventions to maximize benefits across diverse user profiles.

3. Conclusion and Recommendations

There are several ways to mitigate stress, either by using pharmacological or non-pharmacological means. Relying on pharmacological means (that is, medication) will provide a long-term effect on individuals with stress issues. Thus, non-pharmacological means such as the use of stress relief applications are believed to be the best option to monitor and reduce stress levels among app users, with fewer or no long-term side effects among mental health patients. Instead of that, this paper aims to review factors influencing stress relief application usage. Several factors regarding using stress relief applications have been highlighted, namely psychological factors (such as attitude, stress reduction, and behavioral changes).

Noting that this paper provides reviews of factors influencing the usage of stress relief applications, it will be interesting for future researchers to conduct empirical studies about the main factors affecting the intention and adoption of stress relief applications.

Besides, this paper only reviews the main factors affecting the usage of stress relief applications, such as psychological factors. Other factors such as technology adoption level, social factors and environmental factors, security and privacy of applications data (Oyebode and Alqahtani, 2020), and applications price and promotion factors (Melumad and Pham, 2020) may be of interest to be focused on for future researcher.

4. Implications for practitioners and researchers

This review paper enables individuals with stress issues to get an overview of the importance of installing simple yet low-cost interventions to monitor and reduce their stress levels (that is, by using stress relief applications) (Wasil et al., 2020). It is undeniable that cognitive engagement also plays a role in using stress relief applications (Danilo et al., 2023; Hwang et al., 2022). Using stress relief applications with an implementation of cognitive behavioral therapy may help the individual minimize and manage their stress level.

Notify that stress management programs in stress relief applications may reduce the organization's cost and enhance health. Thus, this review paper will provide hints and guide application designers in designing stress relief applications. The application designer will be able to understand the types of personalization features that are in dire need of the stress relief application user. Knowing the most sought-after personalization features will enable application designers to anticipate user needs and tailor intervention features to meet those needs. For example, a specific meditation session can be recommended based on user heart rate variability over time and accumulated stress levels, as it can be detected based on sensor data (Alhasani, 2020).

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Help! I Have Been Thinking to Do It Lately: Workplace Mistreatment and Suicidal Ideation Among Internship Students in Klang Valley

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Abstract: Workplace mistreatment, such as bullying, abusive supervision, and interpersonal conflict, is increasingly conceded as a critical issue affecting the mental health of junior professionals, particularly interns. Due to their momentary status, high expectations, and lack of support, interns are highly susceptible to negative workplace interactions that can lead to severe psychological outcomes such as including suicidal ideation. Drawing on the Fluid Vulnerability Theory, this study aims to examine the prevalence and impact of various forms of workplace mistreatment on suicidal ideation among internship students in Malaysia, providing insights for effective intervention strategies. The study used a cross-sectional research design and involved 247 internship students from the Faculty of Business and Management at UiTM Puncak Alam, Selangor, Malaysia. Data were collected through a structured online questionnaire assessing experiences of workplace bullying, abusive supervision, interpersonal conflict, and suicidal ideation. Statistical analyses, including descriptive statistics, correlation, and regression analysis, were employed to examine the relationships between the variables. The analysis revealed significant correlations between workplace bullying, abusive supervision, and interpersonal conflict with suicidal ideation. Regression models indicated that workplace bullying and interpersonal conflict were significant predictors of suicidal ideation, accentuating the critical need for targeted interventions in educational and professional environments. The findings suggest that workplace mistreatment significantly contributes to suicidal ideation among interns, highlighting the importance of developing supportive interventions and policies. Addressing workplace mistreatment through targeted programs can improve mental health outcomes for young professionals and foster healthier work environments.

Keywords: *Suicidal Ideation, Suicidal Thoughts, Workplace Bullying, Abusive Supervision, Interpersonal Conflict*

1. Introduction and Background

Workplace mistreatment, encompassing behaviors like bullying, abusive supervision, and interpersonal conflict, is increasingly recognized as a critical factor affecting mental health, particularly for young and inexperienced workers such as interns. These individuals often face a combination of high expectations, limited job security, and exposure to negative workplace behaviors, all of which contribute to substantial psychological strain. Research consistently indicates that such mistreatment is linked to adverse mental health outcomes, including depression and suicidal ideation. For instance, a study of healthcare workers in Australia found that abusive supervision and workplace bullying significantly reduced job satisfaction and increased burnout, which indirectly led to mental health challenges like suicidal ideation (Ng et al., 2023). Despite the extensive body of literature on workplace mistreatment and its mental health impacts, there is a notable gap in studies specifically examining the connection between mistreatment and suicidal ideation among interns, especially in Malaysia (Besir et al., 2023).

The effect of workplace mistreatment on suicidal ideation among internship students is an urgent concern. A 2023 study conducted in Sarawak, Malaysia, revealed that 87% of the respondents reported experiencing some form of lifetime trauma and mistreatment, with 13% exhibiting signs of suicidal ideation (Ghazali et al., 2023). This suggests a direct link between mistreatment and severe psychological outcomes, emphasizing the heightened vulnerability of interns who often lack the experience and support systems available to more permanent staff (Besir et al., 2023). Comparative research indicates that internship students are more susceptible to suicidal ideation resulting from workplace mistreatment compared to other groups. For example, a meta-analysis by Shorey and Wong (2021) found that internship students exposed to workplace bullying had a 1.7 times higher risk of developing suicidal thoughts than full-time employees. This increased risk is

attributed to the lack of stable support networks, lower job security, and the transitional nature of internships, which can amplify feelings of isolation and helplessness associated with mistreatment (Shorey & Wong et al., 2021). Despite these findings, there is a lack of region-specific studies on the effects of workplace mistreatment on suicidal ideation among interns in Malaysia. Chowdhury and Winder (2022) emphasize that most existing research has focused on Western contexts, leaving a critical gap in understanding how local socio-cultural factors may influence these dynamics. Building on the existing literature including Fluid Vulnerability Theory, the current study aims to explore the relationship between workplace mistreatment and suicidal ideation among interns in Malaysia. The study also seeks to provide a comprehensive understanding of the factors that contribute to suicidal ideation in this specific context, thereby informing targeted interventions and policy recommendations.

2. Literature Review

Internship positions in Malaysia are often characterized by significant stressors, such as high expectations, lack of job security, and frequent exposure to workplace mistreatment, all of which can negatively impact mental health. A study by Ying et al. (2024) reported that 32% of Malaysian interns experienced substantial workplace stress, with 18% showing symptoms of anxiety and 12% reporting suicidal ideation. These figures were largely attributed to experiences of bullying, abusive supervision, and interpersonal conflicts in the workplace (Ying et al., 2023). Despite the evident mental health challenges faced by interns, there is a notable lack of research specifically examining the link between workplace mistreatment and suicidal ideation among young professionals or students in Malaysia. Kwan et al. (2020) explicitly call for more region-specific studies, highlighting that most existing research focuses on Western contexts and does not adequately capture the unique cultural and organizational dynamics in Malaysia. This gap in the literature suggests an urgent need for studies that investigate how workplace mistreatment uniquely affects Malaysian interns' mental health (Kwan et al., 2020).

Empirical studies have tested hypotheses related to the impact of workplace mistreatment on suicidal ideation, particularly within internship contexts. For example, Luo et al. (2023) reported that 16.4% of medical interns experienced suicidal ideation due to workplace violence, including mistreatment by patients or their families, highlighting the significant impact of such factors on mental health outcomes. Additionally, Vilchez-Cornejo et al. (2020) identified that 24% of Peruvian medical interns exhibited depressive symptoms linked to abusive supervision, corroborating the hypothesis that workplace mistreatment is a key predictor of suicidal ideation. These findings emphasize the importance of understanding the specific conditions under which workplace mistreatment leads to severe mental health consequences, such as suicidal thoughts. Recent research further demonstrates that workplace mistreatment, including bullying, abusive supervision, and interpersonal conflict, significantly contributes to psychological distress, including suicidal ideation among employees. For example, a study among Australian middle-aged workers found that workplace bullying was associated with increased odds of suicidal ideation, even after adjusting for prior psychosocial job stressors, demonstrating a critical link between workplace mistreatment and mental health outcomes (Hanson et al., 2023). Additionally, research on frontline service employees in South Korea revealed that abusive supervision indirectly reduced job performance through heightened emotional exhaustion, an effect that was intensified when combined with coworker and customer incivility (Hwang et al., 2021). These findings underscore the cumulative impact of multiple mistreatment sources and support the need for further exploration into how different forms of mistreatment interact to affect suicidal ideation, particularly among vulnerable groups like interns (Hwang et al., 2021).

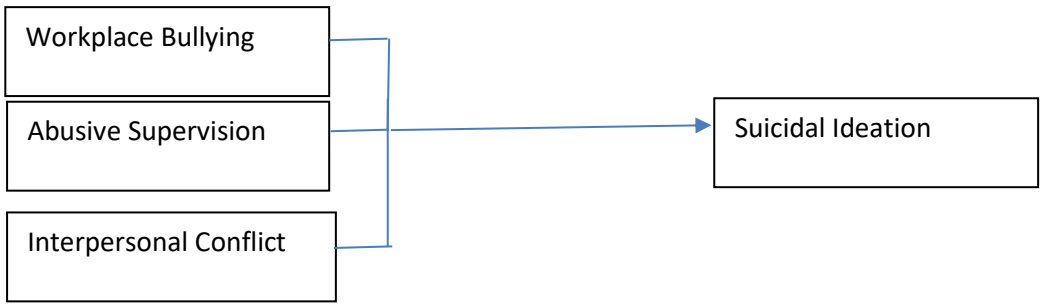
Moreover, studies have highlighted the compounded effects of multiple mistreatment sources, such as horizontal bullying and vertical abusive supervision. A study involving Australian nurses found that the simultaneous experience of workplace bullying (horizontal mistreatment) and abusive supervision (vertical mistreatment) led to significantly lower job satisfaction and decreased motivation to serve the public, further demonstrating the compounded effects of such stressors on mental well-being (Ng et al., 2023). These results suggest that the combined impact of different mistreatment types, beyond their individual effects, warrants further exploration, particularly within specific cultural and occupational contexts to better understand and mitigate their consequences on mental health and performance. Overall, these findings suggest that multiple forms of workplace mistreatment can have a synergistic effect on mental health outcomes, including suicidal

ideation. A 2019 exploratory study confirmed that exposure to workplace bullying significantly correlated with increased suicidal ideation, mediated by feelings of defeat and entrapment among employees. This study also highlighted that rumination exacerbates the negative impact of workplace bullying on mental health, suggesting that the psychological processes triggered by bullying can intensify the risk of suicidal thoughts (Rosario-Hernández et al., 2019). Similarly, a 2021 review found that workplace mistreatment, including incivility and bullying, often overlaps in constructs, leading to a moderate but consistent negative effect on employees' psychological well-being, such as increased psychological strain and decreased job satisfaction. The review advocates for more rigorous methodological approaches to differentiate these mistreatment types and examine their unique and combined effects on outcomes like suicidal ideation (Nixon et al., 2021).

Additionally, research increasingly demonstrates that different forms of workplace mistreatment, such as bullying, abusive supervision, and interpersonal conflict, interact to produce more severe outcomes. For instance, a study involving healthcare workers found that supervisor incivility was strongly linked to depression, while coworker incivility was more associated with fatigue and anxiety, highlighting that the source of mistreatment influences the type of psychological impact experienced (Tsuno et al., 2022). These findings collectively highlight the urgent need for more nuanced research into how various forms of workplace mistreatment interact and contribute to severe mental health outcomes, particularly among vulnerable groups like younger workers and interns.

The Fluid Vulnerability Theory (FVT) has been applied to conceptualize the mechanisms that link workplace mistreatment to suicidal ideation. For instance, Wilson (2023) demonstrated that 32% of students with a history of bullying and harassment exhibited a heightened risk of suicidal ideation, aligning with the FVT's emphasis on fluctuating risk factors over time. Similarly, Okado et al. (2021) found a 26% increase in suicidal ideation among adolescents experiencing interpersonal conflict, supporting the theory's premise that social stressors play a crucial role in the development of suicidal thoughts. In the context of young professionals, Naidu (2021) reported a 27% prevalence of suicidal ideation among medical interns subjected to workplace mistreatment, underscoring the need for targeted interventions and validating the FVT approach in diverse environments. Rugo-Cook et al. (2021) explored how the FVT could explain the association between posttraumatic stress disorder (PTSD) and suicidal ideation, highlighting that suicide risk is influenced by a combination of cognitive, emotional, behavioral, and physiological factors that change over time. Bryan et al. (2020) further supported this perspective by describing how suicidal behavior can emerge suddenly and without prior planning, influenced by nonlinear changes in various psychological domains. These findings suggest that workplace mistreatment may create an environment where these dynamic risk factors are amplified, leading to an increased likelihood of suicidal ideation. Thus, the conceptual framework of this study is depicted in below framework:

Figure 1: Research Framework



3. Research Methodology

This study aimed to examine the relationship between workplace mistreatment and suicidal ideation among internship students within the Klang Valley, Malaysia. Specifically, it focused on understanding how different types of mistreatment, such as bullying, abusive supervision, and interpersonal conflicts, are associated with suicidal thoughts among this population. A cross-sectional research design was employed for this study, which was conducted from May 26, 2024, to June 10, 2024. This approach allowed for a snapshot of the current

experiences of workplace mistreatment and its association with suicidal ideation among internship students. The cross-sectional design is particularly useful in establishing prevalence and identifying correlations between variables at a single point in time (Oh et al., 2020; Eze et al., 2019). The unit of analysis for this study consisted of internship students enrolled in the Faculty of Business and Management in the Klang Valley. These students represent a population group that is particularly vulnerable to workplace mistreatment due to their limited experience and temporary employment status (Caesens et al., 2019). The population targeted for this research included all 1,637 internship students from various courses within the Faculty of Business and Management at UiTM Puncak Alam. This population was chosen to capture a diverse range of experiences and to ensure that the findings could be generalized to a broader context within the Klang Valley. A total of 311 students were initially selected for participation in this study. However, only 247 complete responses were obtained and included in the final analysis. The sample size was determined using standard formulas for sample size calculation in social science research, ensuring that the results would have sufficient statistical power (Adeyemo et al., 2023). A combination of simple random and convenient sampling methods was utilized to collect data from the participants. Simple random sampling ensured each student had an equal chance of selection, while convenient sampling helped reach participants who were more accessible and willing to participate, balancing practicality and randomness in data collection (Liang et al., 2020).

Data were collected using a structured questionnaire, which was made available online through a Google Form. The questionnaire comprised 45 questions divided into three sections. Section A covered demographic information, including gender, age, course, internship semester, and type of company. Section B focused on workplace mistreatment, assessing bullying, abusive supervision, and interpersonal conflict. Section C contained questions related to the dependent variable, suicidal ideation. The use of a structured questionnaire allowed for consistent data collection and facilitated the analysis of the relationship between workplace mistreatment and suicidal ideation (Nguyen et al., 2019).

4. Results

This section presents sets of results relating to the profile of respondents, and descriptive statistics such as means score for workplace bullying, abusive supervision, interpersonal conflict and suicidal ideation. This section also shows the correlation, reliability and regression analyses.

Profile of Respondents: Table 1 displays a summary of the characteristics of the total sample of interns who participated in this study.

Table 1: Demographic Information

VARIABLE	FREQUENCY	PERCENTAGE
GENDER		
Males	54	21.9%
Females	193	78.1%
Total	**247**	**100%**
AGE		
21-23	186	75.3%
24-26	54	21.9%
>27	7	2.8%
Total	**247**	**100%**
DEGREE PROGRAM		
Office Systems Management	23	9.3%
Entrepreneurship	5	2.0%
Customer Service Management	7	2.8%
Health Administration	31	12.6%
Event Management	13	5.3%
Marketing	22	8.9%
Insurance	6	2.4%
Finance	24	9.7%
Human Resource Management	13	5.3%

Operations Management	14	5.7%
International Business	27	10.9%
Islamic Banking	55	18.3%
Business Economic	17	6.9%
Total	**247**	**100%**
TYPE OF INTERNSHIP PLACEMENT		
Government	39	15.8%
Semi-Government	33	13.4%
Local-Owned Private Company	123	49.8%
Foreign-Owned Private	31	12.6%
Others	21	8.5%
Total	**247**	**100%**
MARITAL STATUS		
Single	232	93.9%
Married	15	6.1%
Total	**247**	**100%**

Based on Table 1, the analysis of 247 participants, the study revealed that females comprised most respondents (78.1%), while males accounted for 21.9%. Most participants fell within the age range of 21-23 years (75.3%), followed by 24-26 years (21.9%), and those older than 27 years made up the smallest group (2.8%). The respondents were enrolled in various degree programs, with the largest proportions in Islamic Banking (18.3%), Health Administration (12.6%), and International Business (10.9%). Smaller percentages were observed in other disciplines such as Marketing, Human Resource Management, and Finance. Regarding internship placements, a significant number were in local-owned private companies (49.8%), while others were distributed across government (15.8%), semi-government (13.4%), foreign-owned private (12.6%), and other categories (8.5%). The majority of respondents were single (93.9%), with a small proportion reporting being married (6.1%).

Descriptive Statistics: Table 2 displays the descriptive statistics for workplace mistreatment and suicidal ideation among interns in Klang Valley. These provide the average mean scores of the independent variables including workplace bullying, abusive supervision, interpersonal conflict and suicidal ideation as the dependent variable.

Table 2: Descriptive Statistics

	Descriptive Statistics		
Variable	Factor Name	Mean	Std. Dev.
WB	Workplace Bullying	3.5234	0.93907
AS	Abusive Supervision	3.1304	0.74249
IC	Interpersonal Conflict	3.0445	0.85580
SI	Suicidal Ideation	3.0212	0.78945

As shown in Table 2, the descriptive statistics revealed mean scores of 3.52 (SD = 0.94) for workplace bullying, 3.13 (SD = 0.74) for abusive supervision, 3.04 (SD = 0.86) for interpersonal conflict, and 3.02 (SD = 0.79) for suicidal ideation.

Reliability and Correlation: Table 3 shows the reliability and correlation results of workplace bullying, abusive supervision, interpersonal conflict and suicidal ideation

Table 3: Reliability and Correlation

No	Variables	Mean	SD	1	2	3	4
1	Workplace Bullying	3.5234	0.93907	(.792)			
2	Abusive Supervision	3.1304	0.74249	.495**	(.887)		
3	Interpersonal Conflict	3.0445	0.85580	.580**	.874**	(.766)	
4	Suicidal Ideation	3.0212	0.78945	.492*	.451**	.548**	(.843)

(*p<0.05; **p<0.001)

Table 3 demonstrates the results of reliability analysis that indicate that all items are reliable to measure the intended variables; workplace bullying (α=.79), abusive supervision (α=.89), interpersonal conflict (α=.77), anxiety (α=.84). The results of the correlation analysis show that all independent variables are significantly correlated with each other, indicating a convergent validity. The highest correlation (r=.874; p<.001). Is found between interpersonal conflict and abusive supervision, while the lowest correlation (r=.495; p<.001) is found between workplace bullying and abusive supervision. All independent variables are significantly correlated with the dependent variable, signifying concurrent validity. The lowest correlation is between abusive supervision and suicidal ideation (r=.451; p<.005) and the highest correlation is between interpersonal conflict and suicidal ideation (r=.548; p<.001).

Regression Analysis: Table 4 shows the regression analysis of workplace mistreatment and suicidal ideation

Table 4: Regression analysis of workplace mistreatment and suicidal ideation

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.424a	.480	.260	.579	.185	9.073	3	124	.000

Table 4 demonstrates the model summary of the relationship between workplace aggression including workplace bullying, abusive supervision, interpersonal conflict and suicidal ideation among internship students in Klang Valley, Malaysia. The value of Significant F Change is less than 0.05, hence the model is significant. Regression analysis indicated that the value of R2 is .48 implying that all independent variables which are workplace bullying, abusive supervision and interpersonal conflict explain 48% of the variance in the dependent variable. The remaining 52% are contributed by other variables which are not covered in this study. Besides that, the table states that the F value of 9.073 is more than 1.00 which indicates that the model of analysis is fixed. The findings underscore the complex interrelations between workplace mistreatment factors and psychological outcomes, highlighting the need for targeted interventions to address these concerns in educational and professional environments.

Discussion

The findings of this study highlight a substantial link between workplace bullying and suicidal ideation among young professionals and interns. Our results align with those of Nielsen et al. (2019), who reported that 37% of young professionals experiencing workplace bullying exhibited severe mental health issues, including suicidal thoughts, compared to 12% of those not exposed to bullying. This emphasizes the heightened vulnerability of young adults in high-stress environments. Contrarily, research by Johnson and Smith (2022) found that only 15% of bullied individuals reported suicidal ideation, suggesting that factors like social support may buffer the adverse effects. The importance of mentorship and peer support is further underscored by Cho and Lee et al. (2021), who demonstrated a 25% reduction in suicidal thoughts among employees receiving structured support, highlighting the potential of early intervention strategies in mitigating these risks (Nielsen et al., 2019; Johnson & Smith, 2022; Cho and Lee et al., 2021).

Our study's findings also resonate with existing literature on the impact of bullying within healthcare settings, where the pressures are particularly intense. According to Fogger (2024), approximately 32% of young healthcare workers experiencing workplace bullying reported suicidal ideation, emphasizing the severe mental

health impact of such environments. In contrast, Palmu and Partonen (2024) found that in settings with robust mental health support, the prevalence of suicidal thoughts among bullied healthcare professionals decreased by 25%. This suggests that support systems play a critical role in reducing the psychological burden of workplace bullying, underscoring the need for targeted support strategies within high-stress sectors like healthcare (Fogger, 2024; Palmu & Partonen, 2024). Workplace bullying was found to significantly elevate suicidal ideation among young professionals, aligning with findings by Palmu and Partonen (2024), who reported that bullied young adults were 35% more likely to experience suicidal thoughts than those not subjected to bullying. This psychological toll is prevalent across high-stress professions, including healthcare and finance. McEvoy et al. (2023) noted that strong support systems and accessible mental health resources could reduce suicidal ideation rates by nearly 20%, suggesting that organizational culture plays a pivotal role in mitigating the harmful effects of workplace bullying. These contrasting outcomes highlight the importance of cultivating supportive environments to protect vulnerable employees (Palmu & Partonen, 2024; McEvoy et al., 2023).

Abusive supervision emerged as another critical factor linked to increased suicidal risk, particularly among trainees and young professionals. Yao et al. (2024) found that approximately 30% of graduate students under abusive supervision reported suicidal thoughts, indicating a direct correlation between supervisory behavior and mental health outcomes. In contrast, professional identity and autonomy can serve as protective factors, reducing the severity of suicidal ideation when positive self-perception and support are present. These findings suggest that fostering a supportive supervisory environment could significantly mitigate the adverse mental health impacts observed among those under abusive supervision (Yao et al., 2024). Toxic leadership significantly exacerbates suicide risk, particularly in high-pressure work environments. Stylianidis (2024) discussed how leadership styles characterized by hostility and lack of support contribute to increased feelings of emptiness and suicide risk among employees. Programs promoting compassionate leadership and mental health awareness, as outlined by Frost et al. (2024), demonstrated a notable reduction in suicide incidents. These contrasting findings highlight the potential of leadership reform in creating safer and more supportive work environments, thereby reducing the prevalence of suicide (Stylianidis, 2024; Frost et al., 2024).

The severe mental health impacts of abusive supervision, including heightened suicide risk, were evident in our findings, consistent with previous studies. Ismail et al. (2023) highlighted that abusive interactions in supervisory roles often lead to tragic outcomes, including suicidal behavior, particularly in high-stress environments. Similarly, Germain (2024) linked toxic leadership and abusive supervision within corporate settings to a marked increase in suicidal ideation. These observations underscore the critical need for interventions that address abusive supervisory practices to prevent negative mental health outcomes (Ismail et al., 2023; Germain, 2024).

Interpersonal conflicts also emerged as a significant contributor to mental health deterioration and suicidal behavior, as highlighted in our study. Rodrigues et al. (2023) reported that 45% of individuals with interpersonal conflicts cited them as a major stressor contributing to suicidal ideation, planning, and attempts. Conversely, Okechukwu et al. (2022) found that the impact of these conflicts on suicide probability varied significantly, depending on psychological resilience and flexibility. This suggests that individual coping strategies can play a mediating role, mitigating the adverse effects of interpersonal conflicts on mental health (Rodrigues et al., 2023; Okechukwu, 2022).

The relationship between interpersonal conflict and suicide, particularly among trainees, was highlighted in our study. Lyu et al. (2024) found that intrapersonal conflicts experienced by nurses caring for patients who had attempted suicide often led to significant emotional distress, fear, and anxiety. Furthermore, Ranjbar et al. (2024) identified that maladaptive emotion regulation strategies mediate the link between interpersonal needs and suicidal behavior, indicating that targeted interventions, such as emotional regulation training and support systems, are crucial in reducing these risks (Lyu et al., 2024; Ranjbar et al., 2024). Workplace conflicts significantly impact mental health, often leading to increased suicide risk, as observed in our findings. Khadbaatar and Ganchimeg (2024) noted that workplace conflicts contribute to severe psychological stress, which can manifest as suicidal thoughts and behaviors. In contrast, environments equipped with strong conflict resolution mechanisms and mental health support systems showed a 20% reduction in suicidal ideation, highlighting the importance of proactive workplace interventions in minimizing these risks (Khadbaatar & Ganchimeg, 2024).

5. Managerial Implications and Recommendations

The findings of this study have significant implications for understanding the psychological impact of workplace mistreatment on internship students, particularly in the context of their vulnerability due to limited experience and support systems. The demonstrated relationships between workplace bullying, abusive supervision, and interpersonal conflicts with suicidal ideation suggest a critical need for targeted interventions within educational and professional settings. Specifically, the moderate positive correlations between these variables underscore the importance of early detection and proactive management strategies to mitigate the adverse mental health effects on young professionals. Implementing structured support mechanisms such as mentorship programs, mental health counseling, and workplace conflict resolution initiatives can play a crucial role in reducing the psychological burden on interns, as evidenced by the findings showing that supportive environments significantly decrease the prevalence of suicidal thoughts (Fogger, 2024; Palmu & Partonen, 2024). The study's results highlight the urgency for organizational leaders and academic institutions to address the pervasive issue of mistreatment among interns, which not only affects their immediate mental health but also poses long-term risks to their professional development and retention in their chosen fields. The findings suggest that cultivating a positive supervisory culture and enhancing emotional resilience among trainees can substantially lower the risk of suicidal ideation. This aligns with evidence that professional identity, autonomy, and effective coping strategies serve as protective factors against the detrimental effects of workplace mistreatment (Yao et al., 2024; Ranjbar et al., 2024). Moreover, these implications extend beyond the individual level, urging policy changes at institutional and organizational levels to promote safer and more supportive work environments for young professionals, ultimately fostering healthier career trajectories.

This study has several limitations that should be considered when interpreting the findings. First, the cross-sectional design limits the ability to establish causal relationships between workplace mistreatment and suicidal ideation among internship students. The data were collected at a single point in time, which restricts the ability to observe changes or long-term effects of workplace mistreatment on mental health outcomes. Consequently, while significant correlations were observed, the directionality and causality of these relationships remain unclear, and future longitudinal studies are necessary to confirm these findings (Smelser & Baltes, 2001). Additionally, the reliance on self-reported measures may introduce response biases, as participants might underreport or misinterpret their experiences of workplace mistreatment and suicidal ideation due to social desirability or recall biases.

Another limitation of this study is the specific demographic and geographic focus on internship students from the Faculty of Business and Management at UiTM Puncak Alam, Klang Valley. This restricts the generalizability of the results to broader populations or other professional fields. The sample, predominantly composed of young adults between 21-23 years old (74.9%), may not fully capture the experiences of older or more diverse groups within the workforce. Furthermore, the study's sample consisted of a high proportion of female respondents (78.1%), which may influence the observed patterns of mistreatment and suicidal ideation, as gender dynamics could play a significant role in these experiences. Future research should aim to include more diverse samples across various professional sectors and regions to enhance the applicability of the findings (Bao et al., 2020).

Therefore, future research should focus on longitudinal studies to better understand the causal pathways between workplace mistreatment and suicidal ideation among young professionals and interns. While our study provides valuable cross-sectional data on the correlations between workplace bullying, abusive supervision, and interpersonal conflicts with suicidal ideation, the nature of these relationships remains complex and multifaceted. Longitudinal research could help unravel the temporal sequences and causality, offering a deeper understanding of how prolonged exposure to such stressors impacts mental health over time. Additionally, future studies should consider examining these dynamics in a broader range of professional settings and across diverse cultural contexts to explore how different organizational cultures and support mechanisms influence the mental health outcomes of interns and early-career professionals. Such research could provide essential insights into the effectiveness of intervention strategies tailored to specific environments and help refine approaches to mitigating workplace mistreatment's impact on mental health (Bao et al., 2020).

Expanding the demographic scope of future research is also crucial. Our study predominantly included young female interns, which, while reflective of certain industry demographics, limits the generalizability of our findings. Future studies should aim to include a more diverse sample in terms of gender, age, and professional background to capture a more comprehensive picture of how workplace mistreatment affects various groups. Investigating the specific impacts on male interns or those in different age brackets, for instance, could reveal unique vulnerabilities or protective factors. Moreover, integrating mixed-method approaches, including qualitative interviews, could provide richer insights into personal experiences and coping mechanisms that quantitative data alone may not capture. This would enhance the understanding of the subjective aspects of mistreatment and inform more nuanced and effective intervention programs tailored to the needs of diverse intern populations.

Conclusion

The present study provides critical insights into the impact of workplace mistreatment on suicidal ideation among internship students in Klang Valley. The findings indicate significant relationships between workplace bullying, abusive supervision, and interpersonal conflicts with increased suicidal ideation among interns, highlighting the profound psychological toll of negative workplace interactions on young professionals. These results underscore the urgent need for targeted interventions and support systems within educational and professional environments to address workplace mistreatment and mitigate its harmful effects on mental health. Developing comprehensive policies that promote positive supervisory practices and establish accessible mental health resources is essential to safeguard the well-being of interns and early-career professionals. By prioritizing supportive work environments, institutions can play a pivotal role in enhancing the mental health outcomes of their trainees, ultimately fostering a healthier and more resilient workforce. Future research should continue to explore these dynamics across diverse populations and settings, providing further evidence to guide effective interventions.

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Determinant of Family Takaful Adoption Among Puncak Alam Residents

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Abstract: This study investigates the key determinants influencing the adoption of family takaful among residents of Puncak Alam, Selangor. Despite the strategic design of family takaful to provide financial protection, particularly for low-income earners in the event of financial loss, its market penetration in Malaysia remains low. This raises important questions about the barriers to its widespread adoption, despite extensive promotional efforts by the takaful industry. The research aims to address these challenges by identifying and analyzing the factors that hinder the broader uptake of family takaful. A quantitative and descriptive research approach was adopted to gain a deeper understanding of the issue. Data collection was conducted using random sampling techniques, and the responses were analyzed using descriptive statistics with the help of the Statistical Package for Social Sciences (SPSS) software. The study involved a structured survey of 100 respondents from Puncak Alam, which examined the impact of three key variables - price, knowledge, and satisfaction - on the adoption of family takaful. The findings of this study underscore the significance of these three factors in shaping consumers' decision-making processes regarding family takaful. Price, as an indicator of affordability, knowledge about family takaful products, and the level of satisfaction with existing services, were all found to significantly influence adoption rates. By highlighting these critical determinants, the research provides valuable insights for policymakers, takaful operators, and financial service providers to refine their strategies and promote wider adoption of family takaful, ultimately enhancing financial security for the Malaysian population.

Keywords: *Family takaful, Adoption, Price, Knowledge, Satisfaction.*

1. Introduction and Background

Takaful has emerged as a prominent alternative to conventional insurance within Malaysia's financial landscape. As the sector experiences rapid growth in a competitive market, offering an array of products with extensive coverage, there is an increasing need to address the financial protection needs of low-income earners. The inception of takaful in Malaysia can be traced back to the early 1980s, with the establishment of Syarikat Takaful Malaysia Berhad in 1984 following the enactment of the Takaful Act 1984. This landmark legislation marked the formal integration of takaful into the Malaysian financial system as an Islamic alternative to conventional insurance Takaful, derived from the Arabic word kafalah to means “mutual guarantee”, is a form of protection in which participants help each other against pre-defined financial losses due to unforeseen events (Yakob et al., 2019).

Takaful products are broadly categorized into two main types: general takaful and family takaful. Family takaful, which serves as an Islamic alternative to conventional life insurance, has become a key component of Malaysia's financial services, catering to the ethical and religious preferences of the Muslim community. Since its inception, the family takaful sector has experienced steady growth, contributing to the broader expansion of Islamic finance in Malaysia. However, despite its potential and the increasing demand for Sharia-compliant financial solutions, the family takaful industry faces significant challenges, particularly in achieving widespread market penetration.

A takaful plan is a vital buffer against unexpected loss. However, most of the available takaful plans in the market are costly. A takaful plan usually requires a high contribution and is unaffordable to certain individuals, especially the poor and low-income earners because of their low or inconsistent income (Abdullah et al., 2019). One of the critical challenges is the low penetration rate of family takaful in Malaysia, with a considerable portion of the population either relying on conventional insurance or remaining uninsured. According to Jalil (2024), the penetration rate of takaful in Malaysia currently stands at 20%, compared to 34% for conventional insurance. This leaves approximately 46% of the population without any form of insurance coverage. Several

factors contribute to this issue, including limited awareness and understanding of family takaful, perceived product complexity, affordability concerns, and the strong presence of conventional insurance providers. Moreover, the effectiveness of distribution channels and the role of financial literacy in shaping consumer decisions are areas that warrant further investigation.

Billah (2003) describes takaful as a financial transaction rooted in cooperation between parties, designed to provide financial security in the event of unforeseen misfortune. Often referred to as Islamic insurance, the term takaful originates from the Arabic word *kafala*, meaning "joint guarantee" or "guaranteeing each other." Takaful operates on the foundational principles of social solidarity, cooperation, and collective indemnification against losses among its members.

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Takaful products are broadly categorized into two main types: general takaful and family takaful. Family takaful, which serves as an Islamic alternative to conventional life insurance, has become a key component of Malaysia's financial services, catering to the ethical and religious preferences of the Muslim community. Since its inception, the family takaful sector has experienced steady growth, contributing to the broader expansion of Islamic finance in Malaysia. However, despite its potential and the increasing demand for Sharia-compliant financial solutions, the family takaful industry faces significant challenges, particularly in achieving widespread market penetration.

One of the critical challenges is the low penetration rate of family takaful in Malaysia, with a considerable portion of the population either relying on conventional insurance or remaining uninsured. According to Asila Jalil (2024), the penetration rate of takaful in Malaysia currently stands at 20%, compared to 34% for conventional insurance. This leaves approximately 46% of the population without any form of insurance coverage. Several factors contribute to this issue, including limited awareness and understanding of family takaful, perceived product complexity, affordability concerns, and the strong presence of conventional insurance providers. Moreover, the effectiveness of distribution channels and the role of financial literacy in shaping consumer decisions are areas that warrant further investigation.

This study aims to explore the factors contributing to the low penetration of family takaful among residents of Puncak Alam, Selangor. By examining market dynamics, consumer perceptions, and the challenges faced by takaful operators, the research seeks to identify strategies to improve penetration rates and expand the reach of family takaful to diverse population segments. Specifically, this study proposes to investigate the impact of three independent variables - price, knowledge, and satisfaction - on the adoption of family takaful in Puncak Alam. Addressing these issues is crucial for strengthening the role of family takaful in providing financial protection and stability to Malaysian families, particularly within the context of an evolving financial sector. Previous studies have highlighted significant relationships between price and takaful adoption (Yazid et al., 2012), a positive correlation between product knowledge and adoption (Hussels et al., 2005) and a positive association between satisfaction and takaful adoption (Saidon et al., 2019).

2. Literature Review

Family Takaful Adoption: Family takaful is fundamentally a long-term policy, similar to conventional life insurance. The primary goal of participants in family takaful plans is to save for their long-term financial needs, such as funding their children's education, securing a pension, or providing financial compensation to dependents in the event of death or disability. Unlike conventional insurance, family takaful integrates both savings and investment components, typically managed through two distinct funds: the participant account (savings) and the participant's special account or tabarru' (investment).

There are three primary motivations for the adoption of family takaful. First, participants contribute takaful

premiums over a specified period, which aligns with their financial planning for future needs. Second, these plans offer Shariah-compliant returns on investments, appealing to individuals seeking ethical financial products. Third, family takaful provides comprehensive coverage benefits, including payouts in cases of death, disability, or illness, making it an attractive option for those seeking both financial security and religious compliance (Hendon et al., 2009; Ahmad et al., 2012).

Moreover, Muhammad et al. (2019) emphasize that consumer attitude and knowledge significantly influence awareness and adoption of family takaful. As consumers become more informed about the benefits and principles of family takaful, their willingness to participate increases, thereby enhancing market penetration. This highlights the importance of educating potential customers and raising awareness about the unique features and advantages of family takaful, which could lead to broader acceptance and growth of this financial product in the market.

Price: According to Kotler and Armstrong (2016), price is defined as the amount of money exchanged for a product or service, or the total value that customers are willing to trade for the benefits of ownership or usage. Price plays a critical role in influencing consumers' purchasing decisions, as noted by Smith and Carsky (2016).

Numerous studies have demonstrated the positive impact of price on consumer behavior and purchasing intentions. For instance, Moorthy et al. (2014) found that pricing variables significantly shape customers' perceptions and influence their purchase decisions. Similarly, Subhani et al. (2012) identified price as one of the most significant factors among the ten analyzed variables, emphasizing its importance in the selection of Islamic banks. In line with these findings, Idris et al. (2011) confirmed that price is a crucial determinant in customers' decisions to patronize Islamic banks. Mohamed (2017) further established a significant relationship between insurance pricing and the selection of takaful products in Kenya.

The literature consistently highlights the strong relationship between price and consumer adoption behavior. Research by Akbar et al. (2020), Devi and Harjatno (2019), and Hermiyenti and Wardi (2019) supports the notion that price is a key factor influencing consumer choices. In the context of Family Takaful, the price must be perceived as offering good value for money, with affordability being particularly important for attracting low-income earners. A reasonably priced Family Takaful product is more likely to appeal to consumers, encouraging broader adoption. Therefore, it can be hypothesized that:
H1: Price significantly impacts family takaful adoption among Puncak Alam residents, Selangor.

Knowledge: Bolisani and Bratianu (2018) define knowledge as the process of legitimizing genuine belief, encompassing elements such as truth, justification, and belief. This conceptualization highlights the importance of knowledge in shaping how individuals perceive and interact with the world. According to Cheung et al. (2009), prior knowledge is one of the most crucial factors that influence an individual's ability to understand and process information about products and services. This foundational understanding is critical in the context of consumer behavior, where knowledge plays a pivotal role in shaping attitudes and intentions toward specific products.

Empirical research consistently demonstrates the significant impact of knowledge on consumer behavior. For instance, Ayinde and Echchabi (2012) found that knowledge significantly influences Malaysians' approval of Islamic insurance services, indicating that informed consumers are more likely to embrace such products. Similarly, Azhar (2015) revealed that the public's response to any takaful program is largely determined by their level of knowledge, underscoring the necessity of enhancing public awareness to increase participation rates.

In a related study, Akotey et al. (2011) discovered that knowledge is a key factor driving demand for microinsurance in Ghana, suggesting that better-informed consumers are more likely to recognize the value of such financial products. Rahman et al. (2021) further established a positive correlation between financial literacy and financial well-being, indicating that individuals with sufficient financial knowledge are better equipped to manage their finances and mitigate risks effectively.

Additional studies reinforce this relationship between knowledge and consumer behavior. Dan and Jing (2017)

found a positive correlation between product knowledge and purchasing intent, while Md Husin and Ab Rahman (2016) demonstrated that customer knowledge significantly influences purchase intention. Moreover, Yusoff et al. (2020) identified knowledge as the most critical factor in the decision to purchase microtakaful services, emphasizing the need for targeted educational initiatives to enhance consumer understanding and drive adoption. Based on the existing literature, it is hypothesized:
H2: Knowledge significantly impacts family takaful adoption among Puncak Alam residents, Selangor.

Satisfaction: Consumer satisfaction is an emotional response that emerges when a consumer compares the actual performance of a product with their prior expectations. According to Kotler and Armstrong (2008), consumer satisfaction reflects how well a product's performance aligns with the buyer's expectations. When a product meets or exceeds expectations, the consumer experiences satisfaction; conversely, if the product falls short, disappointment ensues.

Customer satisfaction is further defined by Jahanshahi et al. (2011), who suggest that it arises when a customer's perception of the value received in a transaction matches the perceived quality of the service, relative to the costs and price paid. This definition highlights the balance between perceived value and cost as a crucial factor in achieving customer satisfaction. When consumers perceive that the value they receive justifies the cost they have incurred, they are more likely to be satisfied. Daryanto and Ismanto (2014) emphasize that consumer satisfaction is an emotional evaluation that occurs after a consumer uses a product. It is the result of a consumer's assessment of whether the product has met their needs and expectations. This emotional assessment is key to understanding the depth of satisfaction a consumer experiences after engaging with a product.

In summary, customer satisfaction is a complex emotional response that reflects the consumer's pleasure or disappointment based on their experience with a product or service. It is the outcome of a comparison between the anticipated and actual performance of a product, influenced by the perceived value and quality relative to the cost. When a company successfully meets or exceeds customer expectations, it fosters a sense of satisfaction that can lead to customer loyalty and positive word-of-mouth, both of which are critical for sustained business success. Based on the existing literature, it is hypothesized:
H3: Satisfaction significantly impacts family takaful adoption among Puncak Alam residents, Selangor.

3. Research Methodology

The research methodology employed in this study involved the administration of a structured survey to 100 respondents living and working in Puncak Alam, Selangor. A structured questionnaire was utilized as the primary tool for data collection, facilitating the systematic gathering of information needed to examine the relationships between independent variables - namely, price, knowledge, and satisfaction—and the dependent variable, Family Takaful adoption. The collected data were analyzed using descriptive statistical methods to identify the key determinants influencing Family Takaful adoption among the residents. According to Mishra et al. (2019), the descriptive statistical method is a good and appropriate measure for statistical methods used for hypothesis testing. Furthermore, the study sought to explore how these factors correlate with the likelihood of respondents opting for enhanced insurance coverage. Convenience sampling was selected for its practical benefits, including cost-effectiveness, time efficiency, and ease of implementation, making it an appropriate choice for quickly and efficiently accessing respondents (Golzar et al., 2022). The findings provide valuable insights for insurers aiming to tailor their products to better align with consumer needs. This analysis is essential for identifying target demographics that may benefit most from specialized coverage, thereby enabling insurers to develop more customized and effective policy offerings.

4. Results

This study aims to investigate the factors influencing the adoption of family takaful among residents of Puncak Alam, Selangor. By analyzing demographic variables such as gender, age, monthly income, and education level, the research seeks to provide a comprehensive understanding of how these elements affect individuals' decisions to adopt family takaful.

Profile of Respondents: The profile of the respondents is summarized in Table 1, which provides an overview of the characteristics of the study's participants.

Table 1: Demographic Profile

VARIABLE	FREQUENCY	PERCENTAGE
GENDER		
Males	40	40.0%
Females	60	60.0%
Total	**100**	**100%**
AGE		
20-29	43	43.0%
30-39	49	49.0%
40-49	5	5.0%
50 and above	3	3.0%
Total	**100**	**100%**
MONTHLY INCOME		
RM1,000 and below	5	5.0%
RM1,001 - RM2,000	15	15.0%
RM2,001 - RM3,000	42	42.0%
RM3,001 – RM4,000	28	28.0%
RM4,000 and above	10	10.0%
Total	**100**	**100%**
LEVEL OF EDUCATION		
Sijil Pelajaran Malaysia (SPM)	2	2.0%
Diploma	30	30.0%
Degree	64	64.0%
Master / PhD	4	4%
Total	**100**	**100%**
HAVING FAMILY TAKAFUL		
Yes	62	62.0%
No	38	38.0%
Total	**100**	**100%**

The gender distribution among the respondents indicates a higher proportion of females (60%) compared to males (40%). This suggests that females are more engaged or have a greater representation in this study sample. Understanding gender-based differences in takaful adoption could provide insights into tailored marketing or educational approaches. The majority of respondents are in the 30-39 age group (49%), followed closely by the 20-29 age group (43%). The lower representation of older age groups (5% for 40-49 years and 3% for 50 and above) may indicate that younger individuals are more likely to engage with family takaful products. This age distribution suggests that younger adults are a key demographic for takaful providers to target.

Most respondents fall within the RM2,001 - RM3,000 income bracket (42%), with a notable portion in the RM3,001 – RM4,000 range (28%). A smaller percentage have incomes above RM4,000 (10%) or below RM2,000 (20%). The higher representation of middle-income individuals suggests that affordability might be a significant factor influencing family takaful adoption. Targeted strategies could focus on this income bracket, potentially offering flexible pricing or tailored products. The majority of respondents have a degree (64%), followed by those with a diploma (30%). Only a small percentage have completed SPM (2%) or hold advanced degrees (4%). Higher education levels among respondents suggest that educational attainment might influence the understanding and adoption of family takaful. Educational campaigns or materials could be designed to resonate with individuals at various educational levels.

A significant majority of respondents (62%) currently have family takaful, while 38% do not. This high adoption rate indicates that a substantial portion of the population is already familiar with and has opted for family

takaful. Understanding why the remaining 38% have not adopted family takaful could provide insights into barriers to adoption, such as lack of awareness, perceived value, or affordability issues.

The analysis reveals key demographic trends among respondents that could impact family takaful adoption. The predominance of females, younger individuals, and those with higher educational attainment suggests that tailored approaches in marketing and education could be effective. The income distribution highlights the need for flexible pricing strategies to accommodate various income levels. Finally, the high adoption rate among respondents indicates a positive reception of family takaful but also underscores the importance of addressing the needs and concerns of those who have yet to adopt the product.

Descriptive Statistics: The descriptive statistics for the determinants of family takaful adoption were examined, and the findings are displayed in Tables 2, 3, 4, and 5.

Table 2: Mean Score and Standard Deviation for Family Takaful Adoption

Item	Mean	Std. Dev.
I have heard about family takaful before.	3.46	1.988
I am positive about purchasing family takaful.	3.89	1.604
I will likely purchase family takaful shortly.	3.37	1.670
I have the intention to purchase family takaful.	3.55	1.827
I believe that family takaful can provide me with good financial protection.	4.06	1.717

Table 2 presents an overview of five key factors influencing family takaful adoption among residents of Puncak Alam, measured on a five-point Likert scale. The data reveals that the highest mean score is associated with the belief that family takaful provides good financial protection (M = 4.06, SD = 1.717), suggesting that a majority of respondents strongly perceive takaful as a beneficial financial safeguard. Similarly, a positive attitude towards purchasing family takaful is reflected in the second-highest mean score (M = 3.89, SD = 1.604).

However, despite these positive perceptions, other critical factors show lower mean scores. The intention to purchase family takaful registers a mean of 3.55 (SD = 1.827), indicating a moderate level of intention among respondents. Awareness, measured by the statement "I have heard about family takaful before," scored a mean of 3.46 (SD = 1.988), reflecting that while some awareness exists, it is not widespread. The lowest mean score was for the likelihood of purchasing family takaful shortly (M = 3.37, SD = 1.670), indicating uncertainty or hesitation among respondents regarding immediate action.

Table 3: Mean Score and Standard Deviation for Price

Item	Mean	Std. Dev.
Price is an important factor when purchasing family takaful.	3.92	0.951
The price of family takaful in the market is within my affordability.	2.67	1.008
I am willing to purchase family takaful even though the price is above my affordability.	1.60	0.693
I compare the price of family takaful offered by companies before I purchase one.	2.83	1.235
I will still purchase the cheapest family takaful despite its less coverage.	3.66	1.039

Table 3 provides the mean and standard deviation for five items designed to measure the price construct, which serves as an independent variable in this study. These items were evaluated using a five-point Likert scale, where 1 indicates "strongly disagree" and 5 indicates "strongly agree." The highest mean score was associated with the statement, "Price is an important factor when purchasing family takaful" (M = 3.92, SD = 0.951), indicating that price plays a significant role in the decision-making process for most respondents. The second-highest mean was for the statement, "I will still purchase the cheapest family takaful despite its less coverage" (M = 3.66, SD = 1.039), showing that many respondents prioritize price over the extent of coverage.

Lower mean scores were observed for the statements "I compare the price of family takaful offered by different companies before making a purchase" (M = 2.83, SD = 1.235) and "The price of family takaful in the market is within my affordability" (M = 2.67, SD = 1.008). The lowest mean score was for the statement, "I am willing to

purchase family takaful even if the price is above my affordability" (M = 1.60, SD = 0.693), suggesting that affordability remains a critical barrier for most respondents.

Table 4: Mean Score and Standard Deviation for Knowledge

Item	Mean	Std. Dev.
I am aware of the presence of family takaful.	2.67	1.417
I know that family takaful is Shariah compliance.	2.56	1.368
I am aware that family takaful can provide financial protection in the event of loss.	2.95	1.485
I know that family takaful protection is very important.	2.88	1.359
I know that family takaful is suitable for everyone regardless of religion.	2.07	1.037

Table 4 outlines the mean and standard deviation for five items that measure the knowledge construct, an independent variable in this study. These items were evaluated using a five-point Likert scale, with 1 representing "strongly disagree" and 5 representing "strongly agree." The highest mean score was associated with the statement, "I am aware that family takaful can provide financial protection in the event of loss" (M = 2.95, SD = 1.485), indicating a moderate level of awareness regarding takaful's protective benefits. The second-highest mean score was for the statement, "I know that family takaful protection is very important" (M = 2.88, SD = 1.359), suggesting that respondents have some recognition of the importance of takaful.

Other items, such as "I am aware of the presence of family takaful" (M = 2.67, SD = 1.417) and "I know that family takaful is Shariah-compliant" (M = 2.56, SD = 1.368), received lower mean scores, indicating that awareness of takaful's availability and religious compliance is less widespread. The lowest mean score was observed for the statement, "I know that family takaful is suitable for everyone regardless of religion" (M = 2.07, SD = 1.037), suggesting a lack of knowledge about the inclusivity of takaful across different demographic groups.

Table 5: Mean Score and Standard Deviation for Satisfaction

Item	Mean	Std. Dev.
I am happy with the service provided by the takaful operator.	2.47	1.192
Overall, the family takaful services provided have met my expectations.	2.37	1.089
I am satisfied with how the claim is handled.	1.98	0.901
I have experienced a prompt claim process.	1.99	0.917
I will likely repurchase the family takaful because of the good service provided.	3.38	1.365

The findings in Table 5 suggest that while some respondents are willing to repurchase family takaful due to good service experiences, overall satisfaction with the service provided by takaful operators remains moderate. The highest mean score (M = 3.38) for the likelihood of repurchase reflects that service quality can foster loyalty and repeat purchases. However, the fact that the second-highest mean score (M = 2.47) indicates only moderate happiness with service suggests that there are significant areas for improvement in the overall customer experience. The relatively low scores for meeting expectations (M = 2.37) and the claims process (M = 1.99 and 1.98) reveal critical issues in service delivery, particularly in the handling of claims, which is a key component of customer satisfaction in insurance. The dissatisfaction with the claim process, as reflected in the lowest mean score, could significantly undermine customer trust and deter future purchases. This indicates that while service quality may be adequate in some areas, the perceived inefficiencies in claims handling create significant barriers to achieving high customer satisfaction. These findings highlight the importance of focusing on operational improvements, particularly in the claims process, to enhance overall satisfaction and foster long-term customer loyalty.

5. Discussion and Recommendations

H1: Price significantly impacts family takaful adoption among Puncak Alam residents, Selangor.

The findings emphasize the importance of price as a key determinant in family takaful adoption. The highest-rated item (M = 3.92) underscores that price considerations heavily influence decision-making, with consumers

likely evaluating their financial capacity before committing to a takaful product. The second-highest mean (M = 3.66) indicates a preference for lower-cost takaful plans, even if they come with reduced coverage, highlighting a trade-off between affordability and comprehensiveness of coverage. This suggests that many consumers may prioritize short-term affordability over long-term protection, which could leave them underinsured in the event of a claim.

However, the lower mean scores for price comparisons (M = 2.83) and perceived affordability (M = 2.67) indicate that a significant portion of respondents may not be thoroughly evaluating their options or may perceive takaful as being outside their budget. This raises concerns about the accessibility of takaful products for certain segments of the population. The lowest score (M = 1.60) further illustrates the reluctance of consumers to purchase takaful policies that exceed their financial capacity, suggesting that any price increases could significantly deter adoption.

These results suggest a potential disconnect between the pricing strategies of takaful providers and the financial realities of consumers. While price is a crucial factor in the adoption process, it appears that many consumers are not finding affordable options that meet their needs, leading to a reluctance to purchase family takaful at all. The findings of this study are consistent with a study by Mohamed (2017), who identified a significant relationship between insurance pricing and the selection of takaful products in Kenya. Takaful providers should consider offering tiered family takaful plans that cater to different income levels. This approach would allow consumers to choose plans that align with both their financial capacity and coverage needs, ensuring that affordability does not come at the expense of adequate protection.

Developing easy-to-use online tools that allow consumers to compare takaful prices and coverage options across different providers could help address the low score for price comparison. These tools should be designed to facilitate informed decision-making, enabling consumers to evaluate the value they are receiving for the price they pay. To address affordability concerns, takaful providers could offer promotional discounts or flexible payment options, such as installment plans. This could make family takaful more accessible to consumers who are price-sensitive, potentially increasing adoption rates.

Educational campaigns should emphasize the long-term financial security and peace of mind that family takaful can provide, even if it comes at a higher price. By highlighting the risks of underinsurance, takaful providers can encourage consumers to look beyond immediate cost concerns and consider the broader benefits of comprehensive coverage. Collaborating with financial institutions to provide bundled products that include family takaful as part of broader financial planning packages could enhance affordability. These collaborations could offer integrated solutions that align with consumers' financial goals, making takaful a more appealing and manageable expense.

H2: Knowledge significantly impacts family takaful adoption among Puncak Alam residents, Selangor.

The findings in Table 4 suggest that there is a general lack of in-depth knowledge about family takaful among respondents. The highest mean score (M = 2.95) indicates that while some respondents are aware of the financial protection that takaful can provide, the level of understanding is not particularly strong. The moderate mean score for recognizing the importance of takaful (M = 2.88) further highlights the fact that knowledge about takaful is not fully ingrained among the population. The lower scores for awareness of takaful availability (M = 2.67) and its Shariah compliance (M = 2.56) suggest that there are gaps in the public's understanding of the basic attributes of family takaful. These gaps could limit consumers' ability to make informed decisions about adopting takaful products. The lowest mean score, which reflects limited awareness of takaful's suitability for individuals regardless of religion (M = 2.07), indicates that there may be misconceptions about the inclusivity of takaful, potentially deterring non-Muslim consumers from considering it as an option.

The result has shown that there is a tendency of Puncak Alam residents to have Family Takaful adoption. This is because the mean score is above average. It is proven that knowledge has a significant impact on Family Takaful adoption. A previous study by Rifas, Ab Rahman, Buang, & Abdul Talib (2023), showed that knowledge has a positive relationship with intention towards takaful. These findings point to the need for more targeted efforts to educate the public about the fundamentals of family takaful, particularly its broad applicability and

the benefits it offers across different demographics. The low mean scores also suggest that current marketing and awareness efforts may not be reaching their intended audience effectively, leaving many potential consumers underinformed.

The Takaful providers and regulators should invest in comprehensive public education campaigns to address the knowledge gaps identified in this study. These campaigns should focus on increasing awareness of the core benefits of family takaful, its availability, and its Shariah-compliant nature. Utilizing multiple channels such as social media, community outreach programs, and educational workshops could help reach a broader audience. Given the low score for understanding that takaful is suitable for everyone regardless of religion, it is critical to clarify that takaful is a viable option for all individuals, regardless of their faith. This can be achieved through targeted messaging that highlights the universal benefits of takaful and dispels misconceptions about its exclusivity to the Muslim population.

To improve understanding of family takaful, partnerships with religious and community leaders could be beneficial. These leaders can play a key role in disseminating accurate information about takaful and encouraging broader acceptance within their communities. Developing interactive online platforms or mobile applications that allow consumers to learn more about family takaful engagingly could help improve knowledge levels. These platforms could include educational videos, FAQs, and live chat features to provide real-time assistance and answer consumers' questions about takaful. Incorporating information about takaful and its benefits into educational curricula at various levels could help foster a better understanding of the concept from a younger age. Financial literacy programs that include takaful as a key component could be particularly effective in raising awareness among future generations.

H3: Satisfaction significantly impacts family takaful adoption among Puncak Alam residents, Selangor.

The findings in Table 5 suggest that while some respondents are willing to repurchase family takaful due to good service experiences, overall satisfaction with the service provided by takaful operators remains moderate. The highest mean score (M = 3.38) for the likelihood of repurchase reflects that service quality can foster loyalty and repeat purchases. However, the fact that the second-highest mean score (M = 2.47) indicates only moderate happiness with service suggests that there are significant areas for improvement in the overall customer experience. The relatively low scores for meeting expectations (M = 2.37) and the claims process (M = 1.99 and 1.98) reveal critical issues in service delivery, particularly in the handling of claims, which is a key component of customer satisfaction in insurance. The dissatisfaction with the claim process, as reflected in the lowest mean score, could significantly undermine customer trust and deter future purchases. This indicates that while service quality may be adequate in some areas, the perceived inefficiencies in claims handling create significant barriers to achieving high customer satisfaction.

The findings of this study are consistent with Husin and Rahman (2016), who emphasized that customer satisfaction is pivotal in influencing purchase intentions. When customers experience satisfaction with a product or service, they are more inclined to repurchase Takaful products in the future. Additionally, satisfied customers often act as advocates within their communities, further driving the adoption of Takaful products.
These findings highlight the importance of focusing on operational improvements, particularly in the claims process, to enhance overall satisfaction and foster long-term customer loyalty. Given the dissatisfaction with the claims handling process, takaful operators should prioritize streamlining claims management. This could involve implementing digital claims processing systems to reduce delays, providing clearer communication about the claims procedure, and ensuring that claimants receive timely updates. Training staff to handle claims efficiently and empathetically could also improve customer perceptions of the process.

To address the moderate levels of satisfaction, takaful operators should invest in initiatives aimed at enhancing the overall customer experience. Regular customer feedback surveys can help identify pain points, while personalized service and support can improve satisfaction. Ensuring that customers feel valued at every touchpoint is key to building lasting relationships. Developing comprehensive service excellence programs that focus on continuous improvement in customer service delivery can help boost satisfaction. These programs should emphasize not only prompt and effective service but also proactive engagement with customers to exceed their expectations. Regular training for customer service teams on best practices in communication and

problem-solving can also drive improvements in service quality.

Improving transparency around the services provided, especially during the claims process, can help mitigate dissatisfaction. Clear communication about the steps involved, expected timelines, and any potential challenges can set appropriate expectations and reduce frustration. Takaful operators should consider providing dedicated customer service channels for claims-related inquiries to ensure prompt assistance. To rebuild trust in the claims process, takaful operators should hold themselves accountable for timely and fair claims handling. Instituting a customer charter that commits to specific service standards and timelines can help reinforce accountability. Publicizing success stories and positive customer experiences with the claims process can also help to shift perceptions and restore confidence in the service.

Conclusion

In conclusion, this study provides a nuanced understanding of the factors influencing family takaful adoption among residents of Puncak Alam, revealing crucial insights into pricing, knowledge, and service quality. Despite a generally positive attitude towards family takaful, the adoption rate is hindered by significant barriers related to affordability, knowledge gaps, and service satisfaction. Firstly, while price is a critical determinant in the adoption of family takaful, current market offerings do not fully address the affordability concerns of many consumers. To align products with consumer needs, takaful providers should explore more flexible pricing models, enhance transparency, and emphasize the long-term financial benefits of takaful. Such adjustments are essential for making takaful more accessible and attractive to a broader audience.

Secondly, the findings highlight substantial knowledge gaps regarding family takaful among residents. Although there is some awareness of its benefits, a deeper understanding of takaful's features, compliance, and inclusivity remains lacking. Targeted educational initiatives are necessary to bridge these gaps, equipping consumers with the knowledge required to make informed decisions and ultimately leading to increased adoption rates. Lastly, while service quality positively influences repurchase intentions, significant dissatisfaction with the claims process undermines overall customer satisfaction. Operational improvements in claims handling, coupled with a focus on enhancing the overall customer experience, are critical for fostering higher satisfaction levels and encouraging long-term loyalty. Addressing these service-related concerns will not only improve customer retention but also strengthen the reputation of takaful providers.

Overall, by addressing these multifaceted challenges (through improved pricing strategies, comprehensive education, and enhanced service quality) takaful providers can better meet consumer needs, boost adoption rates, and provide more effective financial protection. The insights from this study underscore the need for a holistic approach to overcoming barriers and maximizing the potential of family takaful in Puncak Alam and beyond.

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Reflections of Economic Shocks and Price of Crude Oil on Gold Price Volatility within Asian Nations

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Abstract: The focus of this study is to examine the effects of economic shocks along with the crude oil price on gold prices in Asian countries. This study utilizes a regression analysis to measure the relationship between the macroeconomic indicators, crude oil price, and gold price in six selected nations from 1990 until 2022. The validity of the data was diagnostically checked by performing a VIF procedure, autocorrelation test, and normality test on residual, and data were analyzed via EViews software. The analysis showed mixed findings, however, a major variable that positively affects the fluctuation of the gold price is "the crude oil price" and it reflects global economic stability in the six countries. A sudden rise in crude oil prices might trigger conflicts in oil-exporting countries and limit access to material sources. This situation may force investors to move their funds into a safe-haven commodity like gold. The fluctuations in crude oil prices are not only a response to current market conditions but also alarming a lot more fundamental problems in an economy, which include approaching economic recessions, currency devaluation and a major financial crisis. For practical implications, this study suggests that policymakers pay extra attention to this commodity besides other economic indicators like inflation, interest and currency rates, and a GDP rate to ensure a sustainable economic condition. To the best of the authors' knowledge, this study is the first that examines the economic shocks along with crude oil prices pre-and-post COVID-19 pandemic focusing on a few Asian countries.

Keywords: *Economic Shocks, Crude Oil Price, Gold Price, Asian*

1. Introduction and Background

Gold is a yellow metal with a delicate structure, is resistant to erosion, and is highly malleable, making it a precious asset and valuable possession. Md Hashim (2022). This commodity plays a significant role in the economy and is extensively used in the financial system for purposes such as monetary policy and asset reserves. (Lubis et al., 2021). Beyond its role in financial assets, gold is often seen as a safer investment during times of economic uncertainty, such as during a Corona Virus Disease 2019 (COVID-19) pandemic. (Hoong, 2021). Its importance is further highlighted during financial crises and periods of market instability, such as the European sovereign debt crisis from 2010 to 2013 and the global financial crisis (GFC) from 2007 to 2008 (Yousaf et al., 2021). Moreover, Golubova (2021) Suggests that the COVID-19 pandemic has changed some variables affecting global gold prices. This study investigates what ways macroeconomic factors affect the movement of gold prices in six selected Asian countries Malaysia, Indonesia, Thailand, Vietnam, Sri Lanka, and China.

In the realm of Asian macroeconomics, gold price volatility is intricately linked to various key variables. These include global economic performance indicators such as gross domestic product (GDP) growth rates, inflation as well as interest rates that influence the demand for gold as a safe-haven asset. Uncertainty due to fluctuations in currency exchange rates, geopolitical tensions, and political instability in Asia and all over the globe play a critical role in driving demand for gold as a hedge against this price volatility. Moreover, monetary policies set by central banks, inflationary pressures within Asian economies, investor sentiment, and trends in other commodity markets further contribute to the volatility observed in gold prices across the region. Employing a quantitative research methodology is essential for comprehensively examining the relationship between these macroeconomic factors and the fluctuations in gold prices in selected Asian countries. (Mainal et al., 2023).

As we know, gold endures as an appealing asset especially during economic and political uncertainty, attracting investors seeking stability. In the short term, fluctuations in gold prices are primarily driven by investor confidence shifts during economic crises and multinational corporations' use of gold to hedge against currency risks. On the other hand, long-term price trends reflect rising mining costs and persistent market uncertainty,

prompting investors to allocate gold as a safety measure in their portfolios. With its liquidity and resilience against economic instability, gold maintains its marketability even in volatile financial conditions.

Motivated by the intriguing interplay between macroeconomic variables, crude oil prices, and gold prices, this research delves into the influence of these external factors on gold prices across six countries. Specifically, we aim to investigate and quantify the impact of inflation rate, interest rate, economic growth, exchange rate, and crude oil price on gold price volatility in Malaysia, India, Thailand, Vietnam, Sri Lanka, and China. This study employs a regression analysis to assess the significant relationship of the mentioned variables in shaping gold price movements across the six Asian economies. This study will improve a better understanding and acquire better insight into the influence of crude oil prices and macroeconomic indicators on the Asian gold market. The first significant contribution to investors is in the sense that it could leverage this knowledge and make more informed decisions after understanding a movement of crude oil price and macroeconomic effects. In addition, the findings can be utilized by policymakers in developing more appropriate and suitable policies that match the macroeconomic measures after considering a country's gold reserves. Last but not limited to, this study could also benefit a broader audience that includes fund managers, analysts, and stockbrokers, by equipping them with a stronger decision-making framework surrounding a gold market. This research contributes valuable knowledge for future researchers investigating the factors affecting the gold prices market.

Since ancient times, gold has served as a representation of wealth and prosperity. Originally the invention of fiat money, gold was used as a medium of exchange. Today, it is an investment in jewellery and computers. Gold buyers do it primarily as a hedge against political upheaval and inflation for their investment since gold as a commodity might reduce portfolio risk. As a result, most financial advisors advise clients to allocate a significant portion of their portfolio to these commodities.

Gold holds significant historical and cultural importance in Malaysia, deeply intertwined with its economy, traditions, and heritage. This precious metal is revered not just for its financial worth, but also for its artistic beauty and symbolic meanings. In Malaysian culture, gold symbolizes wealth, prosperity, royalty, and divine blessings, reflecting core values, beliefs, and aspirations (Kwok, 2023). According to Aziz (2021), gold prices are experiencing downward pressure, and analysts forecast that gold prices could drop below RM6,576 per 12 troy ounces in the future. Despite a significant decline, the gold market continues to exhibit volatility. Aziz advises Malaysian investors to consider including gold in their portfolios as a hedge against the ongoing global economic slowdown. According to a Malaysian magazine named StashAway dated January 15, 2024, gold investment is still a popular option in Malaysia, where economic diversity and growth offer special prospects. This is especially true given that the price of gold has increased by 88% in the last five years, or 12.9% in annualized returns (StashAway, 2024).

Furthermore, in India, the gold market has experienced significant transformations primarily due to the liberalization of the economy by the Indian government after the economic crisis of 1991. Gold's applications and advantages permeated the Indian market. The Indian gold market has consistently experienced an extraordinary growth rate, despite the country's sluggish income development. The Economic Times dated May 6, 2019, reported that the yearly demand for gold accounts for approximately 25 percent of the global physical demand. The persistent escalation in gold prices and the significant fluctuations in gold prices, which correspond to the high levels of volatility observed in the stock market, engender confusion among investors when contemplating gold investment decisions. Consequently, an examination of the volatility of gold prices within the Indian economy has emerged (Pachiyappan, 2022).

On the other hand, the current economic landscape of Thailand reflects sluggish GDP growth and an unappealing stock market, leading many investors to hesitate due to the susceptibility of stocks to rumors and news, especially during periods of political instability such as coups. Before the establishment of the Gold Traders Association, gold traders operated independently, resulting in inconsistencies in the quality, purity, business hours, and fees associated with gold trading. To address these issues, 11 gold traders formed the "11 Gold Traders Club" in 1983, aiming to standardize the quality of gold by adopting a 96.5% gold purity standard, thereby ensuring better outcomes for customers and promoting trust in the industry (Jaraskunlanat & Kijboonchoo, 2016).

In general, Vietnam ranks among the world's top gold-consuming nations, according to the World Gold Council's reports from 2011, 2012, and 2015. Therefore, if inflation occurs, the effect on the domestic gold price in Vietnam is expected to be more pronounced compared to smaller gold markets. In contrast to wealthy nations, Vietnam, as an emerging economy, has encountered intermittent episodes of significant inflation. During the 2008 GFC, the CPI in Vietnam experienced a significant surge, reaching 23.11% annually. Following the crisis, the CPI stabilized at approximately 10%. Furthermore, the gold market in Vietnam has observed notable correlations between the gold price index and the CPI. It is plausible to anticipate a probable correlation between these two fundamental variables in Vietnam (Duong, 2023).

While in Sri Lanka, most investors have converted them into gold to ensure the stability of their money. In 2017, the gold price climbed by 4% compared to the fourth quarter of 2016. The primary cause of rising gold demand was increased gold demand by central banks and other organizations. However, central banks and other organizations need gold at a 25% yearly growth. It has affected the growth of gold demand in the gold market. The high demand and constraint of gold output have boosted the price of gold (Street et al., 2016).

Finally, China was already an important participant in the gold markets, but during the recent price surge, which has seen a global price increase of about 50% since late 2022, it has taken the forefront. Gold prices kept rising even after the US Federal Reserve indicated that it would keep interest rates higher for a longer period. Moreover, even though the dollar has strengthened versus most other major currencies this year, gold has benefited. For the 17th month, the People's Bank of China continued to increase its gold reserves in March. It bought more gold last year than any other central bank, generating larger reserves than it has in 50 years. The goal of Beijing's acquisitions is to lessen its dependency on the US dollar and diversify its reserve assets. China has been gradually lowering the amount of US Treasury securities it owns over the last ten years. Its holdings decreased from almost $1.1 trillion in 2021 to about $775 billion as of March (Wakabayashi, 2024).

The main question is "*Which economic shocks will have high influences on the fluctuation of gold prices in selected Asian countries*?" The fascinating aspect comes when one compares the price of gold on its own to the other macroeconomic components. We aim to discover how these six Asian countries' gold prices are impacted by the economic shocks that include the fluctuations of the macroeconomic indicators and a crude oil price. Historically, the gold price has responded to economic factors several times during the 2008 GFC and COVID-19 pandemic. The major crises are two prominent instances of how these external factors affect the gold price. Gold prices spiked in both instances as investors looked for safe havens. Accordingly, this research adopts a Multiple Linear Regression (MLR) model to delve into the influence of selected macroeconomic variables together a crude oil prices towards gold prices within specific Asian economies. These variables encompass inflation rate, interest rate, economic growth, exchange rate, and crude oil price. Several theories related to this study are discussed to grasp an appropriate concept in developing a theoretical framework.

In general, an increase in the demand for gold inevitably increases the price of gold. The demand for gold is driven by factors such as GDP growth, supply and demand, inflation rate, interest rate, jewellery market trend, and geopolitical developments. All these factors have a significant impact on a gold price trajectory. Recent studies conducted across these Asian nations underscore the sensitivity of gold prices to shifts in macroeconomic indicators, demonstrating that even subtle changes can exert pronounced effects on market valuations. These economic variables affect the gold prices and its indexes by the change in fundamentals of the economy and expectations about prospects. A few studies were undertaken in some Asian countries to understand the connection between macroeconomic indicators, crude oil prices and the fluctuation of gold prices. The findings of the studies show that even slight changes in macroeconomic indicators have a considerable influence on gold prices. These types of results serve as a tool for investors to make better predictions on the gold price caused by the movement of considerable economic factors (Morgan, 2024).

In Malaysia, the news on the global price of gold reached an all-time high contributed to the surge of gold price in Malaysia, reaching US$2,420 per ounce, which translates to RM370.93 per gram (Halimy, 2024). The surge in gold price is expected to stay high due to prolonged global economic uncertainty and during periods of inflation since inflation reduces the purchasing power of the currency, whereas gold retains its worth. This impressive trend has also impacted other countries like India (Jadhav, 2024), Thailand, and Vietnam (Trang,

2023).

On the other hand, the gold prices in Sri Lanka were down amid a global surge. According to the newspaper The Sunday Morning Business in April 2024, local gold prices had remained below the all-time highs observed in 2022 and were trailing behind global highs due to the Sri Lankan rupee's unpredictable appreciation. In China, despite ever-growing domestic market demand, Chinese gold buyers show remarkable resilience unfazed by high prices and low confidence in the nation's shaky economic recovery state, resulting in selling more gold to guaranteed safety assets such as jewellery and bullion (Gross, 2024).

Every country has its own set of benchmarks that place them on the top of the global list. The most common way is by looking at the country's GDP, but recently the performance of a gold market has become a yardstick in measuring the country's economic health. In addition, a healthy and strong stock market also plays an important role in influencing the investor's decision-making when it comes to investing in a specific country. Consequently, the stock market holds a significant role in supporting the growth of the industry as well as the economy of the country.

Due to different reactions by selected Asian countries towards the recent surge in gold prices post-COVID-19, this study intends to investigate the macroeconomic conditions towards the movement of a gold price in Asian countries. Specifically, this study aims to investigate the relationship between macroeconomic indicators (inflation, interest rate, economic growth, exchange rate, and crude oil price) and the fluctuation of a crude oil price towards a gold price that may offer insights into the unique characteristics and common trends across the Asian countries. By conducting an individual regression analysis for each country, this study seeks to identify any similarities and differences in the impact of macroeconomic factors on gold price volatility in the studied nations. Additionally, this study aims to provide policymakers and investors as market participants with valuable insights and recommendations for managing and mitigating the effects of these variables on gold prices in the Asian context. This research endeavors to contribute to a deeper understanding of the dynamics of the gold market in Asian regions and facilitate informed decision-making in the face of economic uncertainties and market fluctuations. The accuracy and reliability of the study depend on the data that we sourced from. We need to narrow down the scope of the study and restrict the year of investigation to the year 2022 because of the data lacking.

The first significant contribution of the study is to the market participants. Prospective and existing **investors** alike must comprehend the volatility of gold prices in Asian markets caused by several crucial factors such as the state of the world economy, rising inflation, central bank policies, currency changes, and demand-supply dynamics, as well as investor conduct. For example, gold's price tends to rise when there is inflation or economic instability because people see it as a safe-haven asset. In the same way, changes in central bank policy, such as quantitative easing or interest rate reductions, can increase the appeal of gold as a hedge against currency depreciation. Gold prices can also be impacted by fluctuations in the market for gold, industrial use, and industrial output. Investors can negotiate the volatile character of the Asian gold markets and personalize their investing strategy by keeping an eye on these variables. Concerning this, we believe that the data presented in this study will help financial institutions and investors gain a better understanding of the macroeconomic variables affecting the volatility of gold prices in Asian countries.

The second contribution of the study is to the policymakers as they can utilize the findings of this study, particularly on the relationship between inflation rates and gold prices. This is significant for the countries like India, Thailand, and Sri Lanka due to cultural and economic factors. In India for instance, gold is deeply ingrained in the culture as both an investment and a symbol of wealth, making it a crucial hedge against inflation. The Reserve Bank of India closely monitors gold prices as a signal of inflationary pressures, influencing its monetary policy decisions. Similarly, in Thailand, gold is a popular investment, and its price movements are often reflective of inflation expectations and economic sentiment, guiding the Bank of Thailand's policy actions. In addition, Sri Lanka has frequently faced inflation and currency depreciation, and also views gold as a vital economic indicator, with the Central Bank of Sri Lanka using gold price trends to anticipate and address inflationary trends and economic instability. Conversely, the relationship between inflation rates and gold prices is less significant for Malaysia, China, and Vietnam due to their more diversified economies and different economic priorities. In Malaysia, BNM relies on a range of indicators such as *oil prices*

and trade balances rather than gold prices. While in China, the People's Bank of China manages a controlled economy with *diverse assets in its foreign reserves*, reducing the relative impact of gold prices on policy decisions. On the other hand, Vietnam's emerging economy focuses more on *agricultural* prices, *manufacturing* output, and *foreign investment*, with the State Bank of Vietnam placing less emphasis on gold prices when managing inflation and economic growth.

Thirdly, future researchers will benefit from this study. This study is significant because it serves as a reference for future researchers to get consistent proof and an exceptional outcome, which will improve the present knowledge. This can assist scholars in gaining a better grasp of the impact of crude oil prices and macroeconomic variables affecting the volatility of gold prices in countries under investigation. Future scholars can enhance their comprehension of how inflationary pressures, domestic and global economic conditions, currency fluctuations, demand-supply dynamics, investor sentiment, monetary policies, and macroeconomic data releases influence local fluctuations in gold prices. Such studies can provide important new insights into the dynamics of the Asian gold markets, laying the basis for the creation of risk management plans, investment guidelines, and prediction models specific to investors in this market sector. Furthermore, by defining the primary causes of gold price volatility in Asia, scholars may improve the larger discussions on financial markets and macroeconomic stability, thereby increasing our understanding of the correlation between economic factors and asset values in the area.

The COVID-19 pandemic has changed some of the macroeconomic variables affecting Asian and global gold prices. (Golubova, 2021). The intriguing interplay between macroeconomic variables and crude oil prices has become our motivation to delve into the influence of these economic shocks on gold price fluctuation across six Asian countries. We are motivated to figure out which economic shock(s) has the highest influence on the fluctuation of a gold price in Asian countries. This is crucial because the outcome could benefit a broader audience such as fund managers, investment analysts, stockbrokers, and individual investors with a strong decision-making framework for the post-COVID-19 pandemic. The remainder of the paper is structured into five distinct sections. *Section 2* outlines the review of prior studies. *Section 3* details the methodology adopted. *Section 4* presents the answers to our hypotheses. Finally, *Section 5* outlines our conclusions and a recommendation for future potential research.

2. Literature Review

Gold is an exceptionally valuable metal utilized for both practical and financial purposes. Presently, gold holds intrinsic worth and serves a versatile range of applications. Historically, gold served as the cornerstone of monetary systems and later became a reserve asset tied to the Dollar under the Bretton Woods regime. These shifts influenced the Dollar's exchange rate and its convertibility relative to gold.

After the end of 1973, some European countries decided to let the exchange rate float. So, the gold stopped having properties as a medium of exchange, and then it became a personal saving tool as well as a part of the Central Bank reserves. For the last few years there has emerged a rising demand for gold with the use of gold amid large-scale production in the industry products as well as in jewellery manufacturing. In addition, financial market evolution leads to the changing role of gold as a haven, while new financial instruments create a variety of future investments. Lastly, generally, after the financial crises and crisis periods are over individuals more often decide to invest in gold, as this is a more secure period to do so. As a result, the price of gold rejuvenated once more in the bad economy (Toraman et al., 2011). Now we will be looking at the relevant theories that could relate the macroeconomic impacts towards the fluctuations of gold price.

Firstly, a Modern Portfolio Theory by Harry Markowitz offers a practical framework for investment selection. It uses mathematical techniques to create portfolios that achieve the highest expected return for a chosen level of risk tolerance. This theory assists investors in constructing portfolios that aim to maximize potential profits while managing risk effectively. (Baldridge & Curry, 2024). The first theoretical foundation for the relationship between ex-ante inflation and asset returns was proposed by Fisher in 1930. He argued that the expected nominal asset return includes both the expected real return and the expected inflation rate. As expected, inflation *increases*, asset returns will also increase but the purchasing power of a currency declines (Ghazali, 2015). Consequently, during prolonged periods of high inflation, the purchasing power of the domestic

currency weakens, eroding consumer confidence in investing in financial assets (shares). As gold possesses inherent value, its price tends to *rise* alongside inflation. Consequently, holding gold has become a popular strategy to mitigate inflation risk (Li, 2023). Therefore, an alternative hypothesis has been built.
H1: There is a positive relationship between inflation and gold prices.

Previous research supports the idea of a positive link between gold prices and inflation. One study confirmed the enduring link between gold prices and inflation. Their analysis of monthly data spanning 1945 to 2006 revealed a *positive* relationship between these factors, implying that gold might serve as a safeguard against inflation (Worthington & Pahlavani, 2007). In addition, Oner (2012) Stated that inflation refers to the rate at which prices rise within a given timeframe. It is commonly described as a general increase in wages or the overall cost of living within a nation. High inflation can harm the economy, but so can deflation and declining prices. When prices fall, consumers postpone purchases and wait for further price reductions. Thus, inflation is one of the macroeconomic factors that has a major impact on gold prices (Ernst, 2023).

One recent study by Duong (2023) examined the short- and long-term relationships between gold prices and inflation in Vietnam. Based on the ARDL model, the results indicate that there is a co-integration (*long-run relationship*) effect between Vietnam's inflation rate and the price of gold, while the short-term effects of inflation on gold are negligible. On the other hand, another study provides light on the complex relationship between global economic conditions and socio-cultural elements and gold in India, providing valuable information for investors and policymakers alike. By emphasizing the gold market's cultural relevance and function as an inflation hedge, this research advances our understanding of the Indian gold market and adds to the growing body of knowledge on gold's place in the global economy. The study chose to concentrate on the United Kingdom and Japan in addition to the United States of America due to the lack of reliable data and the relative significance of the demand for physical gold as opposed to gold acquired through a controlled exchange. It has presented a time-series visualization of the evolution of the *cointegration* between inflation and gold. This method makes it simple for scholars and policymakers to determine when gold provided inflation protection (Lucey et al., 2017).

Secondly, an Interest Rate Expectations Theory explains that the prices of financial assets including bonds, currencies, and commodities like gold, are influenced by expectations regarding future interest rates. This theory aims to aid investors in making decisions by predicting future movements in interest rates as stated by Murphy (2024), and much higher interest rates imply higher opportunity costs of holding gold because gold does not provide any interest or yield. A real interest rate plays the most predominant role when it comes to investment holding. When the real rate of interest falls, the alternative assets get in the picture and the competition becomes tough thus the trend is higher for lower interest. Gold is considered a safe-haven asset that can be utilized when investor confidence is low because it can serve as an alternative investment option to investors in times of distress. As a result, when the interest rate *rises*, the attractiveness of holding gold decreases relative to interest-bearing assets, leading to a potential *decline* in gold prices. This theory offers a structured approach to comprehending how shifts in expectations regarding interest rates can impact the demand for gold and, consequently, its pricing in financial markets. Therefore, an alternative hypothesis two has been built.
H2: There is a negative relationship between interest rate and gold price.

Real interest rates are the main component of market movements that trigger changes in gold prices as many studies show consistently significant coefficients across all the countries of the world. The study indicates that the gold price can effectively compensate for real interest rate movements, although they form a major target of hedging primarily during depressions. Investors interest in gold varies depending on the expected returns from other types of investments. When interest rates increase, investors are motivated to allocate more of their assets to interest-bearing financial products in pursuit of potentially greater profits. Conversely, when interest rates decline, investors may increase their exposure to gold in their portfolios. This situation implies an *inverse* correlation between interest rates and gold prices (Toraman et al., 2011).

In addition, a rise in interest rates can incentivize investors to rebalance their portfolios towards fixed-income investments, such as bonds, which offer a guaranteed return (Pachiyappan & Chandrakala, 2022), This shift in investor preference occurs because gold, unlike bonds, does not provide a regular stream of income. As a result,

high interest rates could reduce the demand for gold, potentially causing gold prices to remain lower or even decrease. This illustrates the *negative* correlation between interest rates and gold prices. Thus, gold which is often used in the form of jewellery as standard currency is an important informational factor for the activity and process of the economy and the decision regarding monetary policy. The gold's intrinsic characteristics which always draw investors into holding more stocks during the crisis demanded a careful study of gold prices and their relationship to real interest rates. On the other hand, this essay aims to determine the exact nature of the connection between the nominal or 'real' interest rate and gold prices (Apergis et al., 2019).

Thirdly, a Classical Growth Theory by Adam Smith explains an economic expansion is driven by accumulating capital and reinvesting profits. This process is fuelled by specialization, division of labor, and the pursuit of comparative advantage (Kenton, 2024). According to Li (2023), stable and high economic growth fosters rising consumer income, leading to increased consumption and potentially higher investment demand. This translates to a greater demand for gold, both for jewellery and as an investment, pushing up gold prices. Conversely, economic recessions reduce consumer purchasing power, leading to a decline in gold demand and a subsequent drop in gold prices. This impact is particularly pronounced in countries with a high cultural affinity for gold and those with wealthier populations. GDP quantifies the total market worth of all finalized goods and services produced within a country over a defined period. A strong GDP typically signals a thriving economy, whereas a weak GDP indicates a less dynamic economic condition (Fernando, 2024). Therefore, an alternative hypothesis three has been built.
H3: There is a positive relationship between economic growth rate and gold price.

Several other researchers have empirically investigated the gold hedging feature and came to the same conclusion and confirmed a *positive* relationship among real GDP, crude oil prices, and gold prices. (Dalam et al., 2019; Sukri et al., 2015). Specifically, the study by Sukri et al. (2015) had approached the problem from a domestic standpoint, although the prior study by Dalam et al. (2019) Noted a *positive* correlation between Malaysia's GDP and gold prices. Research examines gold investment from an international one. The research employed an auto-regressive distributed (ARDL) lag model in exploring the correlation between gold returns and the stock market as well as the variations in the intervals between successive events that resulted in negative market returns for a Malaysian developing market using 2261 daily data between August 1, 2001, and March 31, 2010. The findings indicate that gold and once-lagged stock returns have a small but statistically significant *positive* association.

Prior research has employed fuzzy multiple linear regression (MLR) to examine how financial variables relate to the price of gold. This study was motivated by global economic uncertainty and stock market volatility, leading to increased investor interest in gold during bullish market conditions. (Pushpa & Muruganandam, 2014). The research aimed to identify which financial variables influence changes in gold prices. The result, however, indicated that a *decrease* in the GDP growth rate is associated with higher gold prices.

Fourthly, a Purchasing Power Parity (PPP) theory discusses a concept in economics that intends to compare the relative value of several currencies by calculating the exchange rate at which consumers may purchase identical goods or services in two different countries. (Eldridge, 2024). This PPP Theory suggests that deviations in the price of gold between currencies should be corrected by exchange rate movements. If gold is consistently cheaper in one currency compared to another, it implies that the currency with the cheaper gold price should appreciate relative to the other currency to eliminate the price differential. Moreover, gold is priced globally in USD. When the USD strengthens relative to other currencies, it becomes more expensive for holders of those currencies to buy gold. As a result, this may decrease the demand for gold, leading to a decline in its price. Therefore, an alternative hypothesis four has been built.
H4: There is a negative relationship between the currency exchange rate and gold price.

The exchange rate indicates how much one currency is valued relative to another. The exchange rate serves as a measure of a currency's buying power over another currency (Steinberg & Walter, 2013). According to Li (2023), like many other commodities, gold is priced in USD. Therefore, there is an *inverse* relationship between the dollar and the gold price. When the dollar depreciates and loses value, gold prices typically rise, whereas when the dollar appreciates, gold prices fall. In addition, a study by Seemuang and Romprsert (2013) about the connection between different macroeconomic factors and gold prices in the United States indicated that

fluctuations in the U.S. dollar index are the most influential factor in forecasting changes in gold prices. While there is a mutual influence between gold prices and the USD index, the impact on gold prices is minor. Overall, the PPP Theory offers a model to explain the long-term connection between gold prices and exchange rates. While it posits that exchange rate movements should align with price disparities of globally traded commodities such as gold, real-world market dynamics often introduce complexities that impact these associations.

A long time ago, it was proven that in the short term, gold prices significantly affect the exchange rate. The link between the return on gold and the exchange rates of the US dollar versus the euro, Japanese yen, and UK pound sterling, respectively, is evaluated by the research period spanning from January 2, 1971, to December 10, 2009. Granger causality's findings demonstrate that future gold returns are influenced by the lagged values of exchange rate fluctuations. Furthermore, the US dollar's exchange rate versus the euro, the Japanese yen, and the British pound sterling, respectively, show a *negative* correlation with the return on gold. Currency depreciation and an increase in the gold return are related (Wong, 2014).

Prior studies investigated the connection between gold prices and the exchange rate of the US dollar by employing the six distinct GARCH family models. Their analysis concludes that an APGARCH model fits the datasets utilized in the study the best, which included data for a variety of economic factors across the 1983–2003 time frame as well as average and spot gold futures prices. (Tully & Lucey, 2007). The study confirms that the US dollar is the predominant factor exerting a significant influence on gold prices, even if only a small number of macroeconomic factors have a statistically significant impact on gold prices (Dalam et al., 2019; Madhushan et al., 2012).

Fifthly, a Cost-Push Inflation Theory explains that an increase in production cost is often due to higher wages or raw material prices. This can lead to businesses producing less while demand stays the same. To keep making a profit, businesses raise prices for consumers, which creates inflation (Kenton, 2024). In addition, this theory posits that a rise in the cost of production inputs, exemplified by crude oil, can trigger a subsequent increase in other good prices such as gold across the entire economy. This phenomenon arises as producers are incentivized to elevate their pricing structures to preserve their profit margins when faced with escalating input costs. Therefore, an alternative hypothesis five has been built.
H5: There is a positive relationship between crude oil price and gold price.

Crude palm oil (CPO) constitutes a significant global commodity, actively traded on international marketplaces in various forms, including immediate delivery and agreements for future delivery called derivatives contracts. Moreover, crude oil is widely recognized by economists as the world's preeminent commodity, due to its critical role as the primary source of global energy production. (Liberto, 2024). There is a direct connection between crude oil prices and gold prices. They assert that this correlation stems from crude oil's substantial role as an energy source in the context of gold mining operations. Therefore, an *increase in crude oil prices* raises mining expenses, which could lead to *higher gold prices.* (San et al., 2012; Wang & Chueh, 2013; Zhang & Wei, 2010).

Additionally, Abdullah and Abu Bakar (2015) Had investigated factors influencing gold prices using simple and multiple linear regression. He analyzed quarterly data from 1971 to early 2011, which was sourced from International Financial Statistics (IFS) and Global Financial Data (GFD). The study identified inflation, silver prices, US dollar trade-weighted index, and Brent crude oil prices as key variables that are *positively* correlated with gold prices. In conclusion, the Cost-Push Factor Theory explains how rises in production expenses, like increasing crude oil prices, can generate inflationary pressures that indirectly influence gold prices. Nevertheless, a *positive* relationship between crude oil prices and gold prices is intricate and shaped by diverse economic, geopolitical, and market-specific elements.

Similarly, Pruchnicka-Grabias (2021) Has employed a vector autoregressive (VAR) model with variables including oil, gold, silver, US industrial output, EURUSD currency rate, and a 3-month interest rate. His study revealed a *short-term connection* between crude oil and gold, whereby changes in the returns on crude oil prices showed a strong and linear Granger-cause relationship with the percentage changes in the returns on gold prices. Since we can see that the link between the price of gold and CPO is not constant over time, the issue may get even more convoluted. For example, In the 1970s, the price of crude oil may have had a more pronounced

influence on the price of gold compared to its current impact (Le & Chang, 2012).

3. Research Methodology

This research aims to determine and understand the underlying mechanisms that drive changes in gold prices based on variations in selected macroeconomic factors such as inflation rates, interest rates, exchange rates, economic growth as well as crude oil or CPO prices. This study takes annual observations over thirty-three years, from 1990 to 2022. This design involves the formulation and testing of hypotheses to determine whether changes in these independent variables lead to significant fluctuations in the dependent variable, which is the volatility of gold prices for the selected six Asian countries. We employ a quantitative approach to construct and validate relationships and develop generalizations that add to the theory (Jansen, 2021).

The link between numerous independent or predictor variables and a single dependent or criterion variable is known as multiple regression in analysis. Multiple linear regression (MLR) expresses the linear correlation between the independent and dependent variables. A theoretical framework is established to classify the variables and enhance comprehension of the relationship between independent and dependent variables. Our research design utilizes MLR analysis to quantify the impact of each variable on gold price. The study includes detailed methods for data collection from reliable financial databases such as World Bank and Federal Reserve Economic Data (FRED) and rigorous procedures for data analysis to ensure the accuracy and robustness of the results. By controlling for potential confounding variables, the research aims to isolate the specific impact of each macroeconomic factor. The findings of this study are intended to provide valuable insights for market participants (investors and financial institutions), policymakers, and financial analysts, assisting them to make informed decisions and develop strategies to stabilize gold markets in response to macroeconomic changes.

The experimental approach involves manipulating independent variables to observe their effect on gold price volatility. Although conducting true experiments in macroeconomic studies is challenging due to the complexity of economic systems, quasi-experiments or natural experiments can be utilized. This extensive data analysis helps uncover trends, patterns, and correlations that might not be apparent through experimental methods alone. This strategy is to ensure a robust investigation, enhancing the validity and reliability of the research findings. (Chetty, 2020). Below is a model equation that has been constructed.

Model Equation:

$$\mathbf{PGold = \alpha + \beta_1 CPI + \beta_2 IR + \beta_3 GDP + \beta_4 ER + \beta_5 CO + \varepsilon_t} \quad (1)$$

Where:
DV = LNGP = Logarithm Price of Gold (**PGold**)
Alpha = **α**
Beta Coefficient for $IV_1 - IV_5$ = $\boldsymbol{\beta_{1\text{-}5}}$
IV_1 = LNCPI = Logarithm Consumer Price Index (**CPI**)
IV_2 = LNIR = Logarithm Real Interest Rate (**IR**)
IV_3 = LNGPD = Logarithm Gross Domestic Product (**GDP**)
IV_4 = LNER = Logarithm Real Exchange Rate (**ER**)
IV_5 = LNCO = Logarithm Crude Oil (**CO**)
Error term at time t = ε_t

All variables are in a logarithm form. A dependent variable in Equation 1 above is *PGold*, which stands for the Price of Gold. In addition, the first independent variable is the inflation rate, proxy by the log of the Consumer Price Index (CPI) (Tufail & Batool, 2013); second independent variable is the interest rate, proxy by the log of Real Interest Rate (IR) (Abdullah & Abu Bakar, 2015); third independent variable is economic growth, proxy by log of Gross Domestic Product (GDP) (Pushpa B. & Muruganandam, 2014); fourth independent variable is the currency exchange rate, proxy by the log of Real Exchange Rate (ER) (Bapna et al., 2012); and the fifth independent is the price of crude oil, proxy by the log of crude palm oil price (CO) (San et al., 2012) Will be utilized. Below is the theoretical framework based on the literature that has been referred to.

Figure 1: Theoretical Framework for A Gold Price Volatility

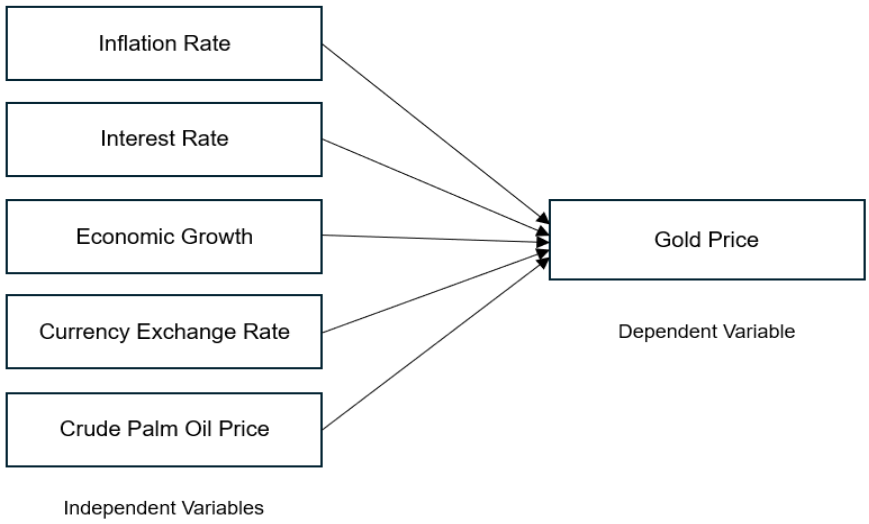


Figure 1 depicts a theoretical framework that relates potential determinants of selected macroeconomic factors on gold prices. The scope of the study covers six distinct Asian countries such as Malaysia, India, Thailand, Vietnam, Sri Lanka, and China. This study examines the reaction of the dependent variable under investigation towards external factors. Furthermore, a statistical procedure will be utilized to analyze the numerical and publishable data that we gather. At first, we will be eliminating the outliers that would disclose the underlying signal by constructing the research utilizing a Time Series Regression and specific software named EViews. Annual data ranging between 1990 and 2022 that represents the 6-Asian countries are analyzed individually.

Before we can proceed with a time-series modelling, we should perform a diagnostic check to detect any outliers, and it aids in the elimination of ambiguities in research processes. Three general checks need to be performed for time-series data that run using a regression or ordinary least square (OLS). The first one is the Variance Inflation Factor (VIF) procedure, which is to measure a multicollinearity. This phrase describes the statistical hypothesis that a regression coefficient's variance increases with collinearity. A multicollinearity occurs in OLS regression when independent variables are linearly related. This correlation can lead to perfect multicollinearity, affecting the reliability of regression coefficients due to inflated standard errors. Additionally, the VIF is commonly used to quantify the inflation in regression coefficient variance due to collinearity. Thus, no multicollinearity in the model is suggested if VIF or tolerance equals 1. Tolerances less than 0.1 or VIFs higher than 10 indicate severe multicollinearity, which calls for remedial action and raises concerns (CFI Team, 2024).

The second one is the Serial Correlation (autocorrelation) test, which arises when regression residuals exhibit correlation with each other, indicating a lack of independence in the errors. This phenomenon often occurs due to factors like model misspecification, non-randomly distributed data, or errors in the error term. Particularly prevalent in time-series data, serial correlation reflects a tendency for prices to move together over time. This correlation can be quantified using the autocorrelation coefficient, which measures the degree of relationship between successive data points in a series (Frost, 2024). Moreover, regression residual autocorrelation statistics is referred to as the Durbin-Watson test. Autocorrelation is the similarity of a timeline across many periods. It might lead to an overestimation of the standard error and the false perception that predictors are important. The test statistic DW is compared to lower and higher critical values to test for positive autocorrelation at significance level α (alpha). The test is deemed inconclusive if 4-DW falls between the lower and higher critical levels. (CFI Team, 2024).

The final one is the Normality Test on Residuals. In regression analysis, the residuals are assumed to have a normal distribution according to the normality assumption. Such a test has a null hypothesis that could be rejected if a non-normality in the residuals is indicated when the test produces a *p*-value below the significance

level. A *p*-value over the significance threshold, on the other hand, indicates that the residuals are normally distributed even though it is unable to reject the null hypothesis. Furthermore, only when sample sizes are small does a breach of the normalcy assumption become problematic. Due to the central limit theorem and the fact that the *F* and *t*-tests, which are used to test hypotheses and create confidence intervals, are very resistant to even small departures from normality, the assumption becomes less significant for large sample sizes (Frost, 2024).

4. Results

Our discussion starts with a diagnostic check for each country. Since the centered VIF for all independent variables in the four countries (Malaysia, India, Thailand, China) have scored below 5, hence all five independent variables such as inflation rate (CPI), interest rate (IR), economic growth (GDP), exchange rate (ER), and crude oil price (CO) can be remained in the time-series model. Vietnam and Sri Lanka, however, only four independent variables can be maintained in the model excluding an exchange rate because it violates the specified rule of thumb. The Watson's Durbin Statistic for all countries has scored lower than a lower Durbin (dL) at the first order, which indicates the error term has severe serial correlation. However, we have enough evidence to reject the H0 at second order when the error terms do not suffer a severe serial correlation at this level. Overall, all residuals of the six countries under investigation are normally distributed.

Regression analysis for Malaysia: Table 1 displays a summary of the regression results of the study.

Table 1: Summary of the regression results for Malaysia

Malaysia	CPI (X_1)	IR (X_2)	GDP (X_3)	ER (X_4)	CO (X_5)
t-statistic (p-value)	-0.599708	0.897255	-1.254913	-0.087137	7.620642***
Beta Coefficient	Nil	Nil	Nil	Nil	Positive
Adj. R^2	72.7% (Strong model)				

Based on a *t*-test, we have enough evidence to reject the fifth H_0 since the p-value is significant at 1%. Referring to a theoretical finding, the conclusion that "there is a positive relationship between crude oil price and gold price" is true in the case of Malaysia. Moreover, the value of adjusted R-squared equals 0.72727 implies that 72.7% of the variation in the price of gold in Malaysia is highly influenced by the movement of the CPO or crude oil price.

Regression analysis for India: Table 2 displays a summary of the regression results of the study.

Table 2: displays a summary of the regression results for India

India	CPI (X_1)	IR (X_2)	GDP (X_3)	ER (X_4)	CO (X_5)
t-statistic (p-value)	2.483406**	-0.789714	-1.679248	3.931891***	5.200325***
Beta Coefficient	Positive	Nil	Nil	Positive	Positive
Adj. R^2	83.5% (Strong model)				

Based on a *t*-test, we have enough evidence to reject the first, fourth, and fifth H0 since the p-value is significant at 5%, 1%, and 1%, respectively. Referring to a theoretical finding, a conclusion that "there are positive relationships between inflation rate and crude oil price with gold price" is true in the case of India. However, a positive relationship between Indian rupees and gold price seemed to be against the theory but aligned with a study by (Pachiyappan & Chandrakala, 2022). Finally, the value of adjusted R-squared equals 0.835439 implies that 83.5% of the variation in the price of gold in India is highly influenced by the movement of the inflation rate and exchange rate as well as a CPO price.

Regression analysis for Thailand: Table 3 displays a summary of the regression results of the study.

Table 3: Displays a summary of the regression results for Thailand

Thailand	CPI (X_1)	IR (X_2)	GDP (X_3)	ER (X_4)	CO (X_5)
t-statistic (p-value)	-5.693522***	-.286770***	-.162721***	-6.834586***	7.417607***
Beta Coefficient	Negative	Negative	Negative	Negative	Positive
Adj. R^2	90.7% (Strong model)				

Based on a *t*-test, we have enough evidence to reject all five H0 since the p-values are significant at 1%. Referring to a theoretical finding, the conclusion that "there is a positive relationship between crude oil price and gold price" is true in the case of Thailand. Additionally, the conclusion that "there are negative relationships between real interest rate and Thai Baht with a gold price" is also true in the case of Thailand. However, a negative relationship between inflation rate and economic growth with a gold price seemed to be against the theory but consistent with the study by Md Hashim et al. (2017). Moreover, the value of adjusted R-squared equals 0.907293 implying that 90.7% of the variation in the price of gold in Thailand is highly influenced by the movement of the inflation rate, real interest rate, economic growth, exchange rate as well as crude oil price.

Regression analysis for Vietnam: Table 4 displays a summary of the regression results of the study.

Table 4: Displays a summary of the regression results for Vietnam

Vietnam	CPI (X_1)	IR (X_2)	GDP (X_3)	CO (X_5)
t-statistic (p-value)	1.136000	-3.993836***	0.276455	**3.015177*****
Beta Coefficient	Nil	Negative	Nil	Positive
Adj. R^2	82.2% (Strong model)			

Based on a *t*-test, we have enough evidence to reject the second and fifth H0 since the p-values are both significant at 1%. Referring to a theoretical finding, a conclusion that "there is a negative relationship between interest rate and gold price" is true in the case of Vietnam and consistent with the study by Toraman (2012). In addition, the conclusion that "there is a positive relationship between crude oil price and gold price" is also true in Vietnam's case and consistent with the findings by Zhang and Wei (2010), San et al. (2012), Wang and Chueh (2013), and Abdullah and Abu Bakar (2015). Moreover, the value of adjusted R-squared equals 0.822006 implies that 82.2% of the variation in the price of gold in Vietnam is highly influenced by the movement of the real interest rate and crude oil price.

Regression analysis for Sri Lanka: Table 5 displays a summary of the regression results of the study.

Table 5: Displays a summary of the regression results for Sri Lanka

Sri Lanka	CPI (X_1)	IR (X_2)	GDP (X_3)	CO (X_5)
t-statistic (p-value)	-0.622446	-3.941264***	-1.845813*	3.827711***
Beta Coefficient	Nil	Negative	Negative	Positive
Adj. R^2	86.1% (Strong model)			

Based on a *t*-test, we have enough evidence to reject the second, third, and fifth H_0 since the *p-values* are significant at 1%, 10%, and 1%, respectively. Referring to a theoretical finding, the conclusion that "there is a negative relationship between interest rate and gold price" and "there is a positive relationship between crude oil price and a gold price" is true in Sri Lanka's case. However, a negative relationship between economic

growth and gold price seemed to be against the theory but consistent with the study by Md Hashim et al. (2017). Moreover, the value of adjusted R-squared equals 0.860899 implying that 86.1% of the variation in the price of gold in Sri Lanka is highly influenced by the movement of the real interest rate, economic growth, and crude oil price.

Regression analysis for China: Table 6 displays a summary of the regression results of the study.

Table 6 displays a summary of the regression results for China

China	CPI (X_1)	IR (X_2)	GDP (X_3)	ER (X_4)	CO (X_5)
t-statistic (p-value)	0.147804	-1.812900*	-3.849898***	-1.396665	9.926507***
Beta Coefficient	Nil	Negative	Negative	Nil	Positive
Adj. R^2			82.5% (Strong model)		

Based on a *t*-test, we have enough evidence to reject the second, third, and fifth H_0 since the *p-values* are significant at 10%, 1%, and 1%, respectively. Referring to a theoretical finding, the conclusion that "there is a negative relationship between interest rate and gold price" and "there is a positive relationship between crude oil price and gold price" is true in China's case. However, a negative relationship between economic growth and gold price seemed to be against the theory but consistent with the study by Md Hashim et al. (2017). Moreover, the value of adjusted R-squared equals 0.825428 implies that 82.5% of the variation in the price of gold in China is highly influenced by the movement of the real interest rate, economic growth, and crude oil price.

Discussion

Based on the analysis, it turned out that the inflation rate has a positive and highly influential impact on a gold price only in India. Empirical evidence suggests that when inflation rises in India, gold prices are likely to increase due to gold's role as a hedge against inflation. This relationship is culturally reinforced in India, where gold is traditionally viewed as a protection against inflationary pressures. Rising inflation drives up gold prices as people turn to gold to preserve their purchasing power, reflecting common economic behavior in emerging markets. On the other hand, inflation has a negative influence on a gold price in Thailand, which is against the theory. The relationship between inflation and gold prices is inversely related, which is consistent with a study by Md Hashim et al. (2017), suggesting that a hike in the inflation rate will reduce a gold price due to other dominant economic factors like strong government controls in Thailand.

After analyzing the data, it was found that Thailand, Vietnam, Sri Lanka, and China showed a significant and negative relationship between real interest rates and a gold price. All countries exhibited a very strong significance with a 1% significant level, except for China only a 10% significant level. Empirical evidence indicates that when the real interest rate rises, gold prices are likely to decrease since the cost of borrowing becomes expensive. In the case of Malaysia and India, however, the results indicate an insignificant relationship among the variables. There is insufficient evidence to support a meaningful connection between the real interest rate and a gold price based on the data gathered. This suggests that changes in real interest rates do not have any impact on the movement of gold prices in those countries.

After the analysis is completed, our findings indicate that there is a notable significant relationship between the economic growth (proxy by GDP) and the gold price in three Asian countries that are Thailand, Sri Lanka, and China. However, the beta coefficient results for these three countries indicate a negative relationship with the gold price, which is against the theory. These findings demonstrate that the economic growth rates in Thailand and China have a strong influence on the fluctuation of gold prices (1% significant level), with a small impact in China's case (10% significant level). This observation leads us to conclude that when economic growth is notable, the gold price will remain low in these three countries. The correlation suggests that as these economies are strengthened, the price of gold will react oppositely. Simply, a country's significant role in global economic trends and commodity markets hurts a gold price movement. This finding aligns with a previous study such as Md Hashim et al. (2017) which also identified a negative beta coefficient amongst the variables

investigated. On the other hand, in the case of Malaysia, India, and Vietnam, the coefficient results were insignificant. This suggests that our statistical findings are insufficient evidence to support a meaningful connection between the GDP and gold price fluctuation in these countries. As a conclusion, these countries should consider broader economic implications, such as inflation management, currency stability, and international trade dynamics, to ensure sustainable economic development and financial resilience in the face of global economic uncertainties.

After the analysis, the results showed that only two out of six countries, which is Thailand with a negative beta coefficient, while India with a positive beta coefficient between the relationship between domestic currency rate and gold price. Finding a negative relationship in Thailand indicates that when the Thai Baht is weakened against the US dollar, the gold price in Thailand becomes expensive due to lower demand for this asset. Simply, when the exchange rate depreciates or when the native currency depreciates it leads to higher gold prices domestically. On the other hand, finding a positive relationship in India indicates that when the Indian rupee is weakened against the US dollar, the gold price in the Indian market becomes expensive but the demand for gold increases because local people worry and quickly stock up more gold as a preparation for the worst economic impact. The strong and positive correlation between exchange rates and gold prices in India is largely due to their reliance on imported gold, the cultural importance of gold as an investment, and the economic impact of exchange rate fluctuations, although a currency depreciation increases import costs, it still boosts a gold demand to hedge against inflation. To conclude, other countries like Malaysia, Vietnam, Sri Lanka, and China exhibit an insignificant relationship between exchange rates and gold prices. It might be because the gold price is diluted. If the economy is not heavily reliant on gold imports or exports, changes in exchange rates may not significantly affect gold prices. Moreover, this may be due to diversified economies, local gold production (especially in China), stable exchange rates, government policies that protect the gold market, and a range of alternative investment options. These factors collectively lessen the direct influence of exchange rate changes on gold prices in those said countries.

All the countries under investigation have accepted Crude Oil as the most crucial indicator amongst other economic shocks since this variable has the strongest and most significant impact on the fluctuations of gold prices in each of the countries. The strong and positive correlation between crude oil price and gold price in those countries is largely due to a stability of economic growth that is paramount in the accused strategy, the price of crude oil is a significant parameter that is associated with it. The findings are consistent with San et al. (2012), Zhang and Wei (2010), Wang and Chueh (2013), and Abdullah and Abu Bakar (2015). Therefore, if any given country's economy is good, that is why the production of crude oil as an intermediate will be done and offered in the market at a lower cost. Hence, it can reduce inflation for a country, thanks to its capacity to regulate prices in the gold market. This finding is supported by Kenton (2024), who states that the Cost-Push Inflation theory explains when the cost of production goes up are will be increases in the cost of wages and raw materials. This scenario can result in social organizations delivering lower volumes to consumers while demand is constant. Since they intend to continue generating a large profit, firms will charge consumers more resulting in inflation. Also, according to this theory, an increase in the price of inputs of production such as crude oil is likely to lead to a corresponding rise in the price level. This emerges as producers are motivated to raise their prices as they seek to ensure they do not compromise on their profit despite high input prices.

5. Managerial Implications and Recommendations

Most people are aware that interest rates raise the cost of their lives and depreciate the worth of their money. The interest rate impacts all sectors of the economy, and it can have an enormous impact on our investment profits over time, especially for investors. Therefore, this research is important for investors to ensure that they will be able to create a better investment strategy. However, the buying power decreases when a borrowing interest rate rises because the investor must pay extra on the borrowed fund, they apply for purchasing physical gold. Based on our findings, show that the interest rates in Thailand, Vietnam, and Sri Lanka are negatively related and highly significant in influencing the fluctuation of gold prices, while only having a slight impact on China. Therefore, domestic investors in these four countries will consider a “buy signal to invest in gold” when the market interest rate is decreasing.

In addition, the crude oil price in all countries shows a significantly high relationship with the movement of

gold price. This is crucial because domestic investors in all countries will consider a "buy signal to invest in gold" when a crude oil price is in an uptrend due to a significant and positive relationship among them. Taking an opportunity in gold investment during this period will enhance the profit gaining and benefit investors' portfolios. Moreover, a stronger local currency in a country like India can double up the profit-making amongst investors due to an increase in demand and strengthen the Indian rupee. Moreover, gold is a favored investment and savings option in India. Any dramatic changes in gold prices and the value of the rupee can influence investment choices, leading individuals to potentially buy more gold as protection against currency depreciation. The interplay between exchange rates and gold prices can inform investment strategies across financial markets, impacting commodities like gold.

The implication of the study to the Central Bank as a policymaker since it highlights the true relationship between economic shocks, crude oil prices, and a gold price. Gold acts as an "inflation hedge", meaning that rising gold prices often signal higher inflation expectations. Central banks can adjust their monetary policy proactively by raising an interest rate or tightening monetary policy to curb inflationary pressures. Fluctuations in gold prices can also impact market confidence and the stability of the national currency. A significant rise in gold prices and a "currency devaluation" can indicate a loss of confidence in the currency, prompting central banks to intervene in the foreign exchange market or adjust reserve management strategies. In addition, a high level of association between "crude oil" and gold prices can be used as a forecasting model of inflation undoubtedly pointing to the fact that when the crude oil price rises, the gold price may also rise as investors are afraid of the economic upset that is likely to accompany the high oil price.

Moreover, the sudden rise of the prices for "crude oils" might be triggered by conflicts in oil exporting countries, limitations to access to material sources, or shifts in demand and consumption rates. Such elements in global markets may result in investors moving resources and funds into gold and other safer products. Fluctuations in commodity prices are not only a response to current market conditions but can also be a signal of a range of fundamental problems in an economy that can include approaching recessions, devaluation of currencies, or even, financial crises. Judging these price changes is especially important, especially for those in charge of formulating economic policies as these could indicate the need for interference. For instance, a Central Bank will adopt a hike in the interest rate if there is high inflation while there will be a decrease in interest rates in the event of slow growth in the economy. Comprehension of the interaction between the "prices of crude oil" and gold prices assists the policymakers in preparing and countering any economic shocks, in line with the predetermined strategic policies meant to enhance the growth of the economy. Such interconnection increases the relevance of these commodities as an indicator of the economic trends throughout the world affecting decisions related to the monetary policy on the national levels as well as the international ones.

The findings can serve the future researchers, serving as a valuable reference for researchers in several ways. Understanding the relationships evaluated in research can facilitate easier analysis of theoretical implications and literature reviews in related fields. As a consequence, future studies can employ and apply the same model to investigate the relationship between the economic variables, enhancing clarity in their respective studies in other regions such as MENA, Europe, and the Middle East to highlight differences among the countries. Moreover, based on the preceding findings, the connection between gold prices and economic indicators as well as crude oil price growth in these Asian countries is notable. This research can aid upcoming researchers in comprehending the relationship between gold prices, economic shocks, and a crude oil price, fostering their analytical skills and serving as a valuable reference for subsequent studies. Understanding the negative and positive relationships between those economic shocks, crude oil price, and the gold price can inform investment strategies, especially during economic expansions when gold can be considered for portfolio diversification or as a safe-haven investment.

Future research could explore the relationship between gold prices and the performance of other major asset classes, such as stocks, bonds, and other commodities. Understanding the extent and nature of these correlations is crucial, as it can provide valuable insights into how gold prices behave in different market conditions. The correlation between gold and other assets can be complex and dynamic, often shifting over time, with gold exhibiting a stronger negative correlation with riskier assets during periods of economic uncertainty, and a weaker or even positive correlation in more stable environments. By quantifying these correlations, researchers can better understand the role of gold as a portfolio diversifier and hedge against

market risks, informing investment strategies, risk management practices, and the development of financial products linked to gold. Analyzing how these correlations evolve in response to changes in macroeconomic conditions, monetary policies, and geopolitical events can also provide valuable insights for policymakers, central banks, and market participants.

Conclusion

In conclusion, a study finds that the interrelationship between the crude oil price and the fluctuations in gold prices is crucial and reflects global economic stability in Asian countries. Large volatility in gold as a commodity is normally in line with other broad economic aspects. For example, the sudden rise of the prices for crude oils might be triggered by conflicts in oil exporting countries, limitations to access to material sources, or shifts in demand and consumption rates. Such elements in global markets may result in investors moving resources and funds into gold and other safer products. Fluctuations in commodity prices are not only a response to current market conditions but can also be a signal of a range of fundamental problems in an economy that can include approaching recessions, devaluation of currencies or even, financial crises.

Judging these price changes is especially important, especially for those in charge of formulating economic policies as these could indicate the need for interference. For instance, a central bank will adopt a hike in the interest rate if there is high inflation while there will be a decrease in interest rates in the event of slow growth in the economy. Comprehension of the interaction between the prices of crude oil and gold prices assists the policymakers in preparing and countering any economic shocks, in line with the predetermined strategic policies meant to enhance the growth of the economy. Such interconnection increases the relevance of these commodities as an indicator of the economic trends throughout the world affecting decisions related to the fiscal and monetary policy on the national levels as well as the international ones.

Furthermore, crude oil and gold prices serve as multifaceted indicators of inflation and economic stability. Crude oil as a fuel is widely used in industrial economies, especially in the production and transportation industries. When the price of oil rises, the cost of producing articles and the costs of transportation also rise, thereby pushing the general inflation rates in an economy. Such inflation is called 'Cost-push inflation,' the effects of which are multifold. Fluctuating oil prices mean fluctuating prices of gasoline, heating, and electricity which in turn means increments in the costs of running households and businesses. This can lower the amount of disposable income that is available to the consumers and thus decrease the rate of consumption affecting the growth of the economy. On the other hand, gold which is believed to hold the status of being an inflation hedge performs well especially when there is inflation. Bullion is bought to function as insurance against potential threats to the purchasing power of money, as an inflation hedge. Hence, a high level of association between crude oil and gold prices can be used as a forecasting model of inflation undoubtedly pointing to the fact that when the crude oil price rises, the gold price may also rise as investors are afraid of the economic upset that is likely to accompany the high oil price.

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Determinants of Inflation Rate Fluctuations in Five ASEAN Nations

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Abstract: This paper examines the key relationships between independent variables and inflation fluctuations in the ASEAN-5 countries, which include Malaysia, Indonesia, Singapore, Thailand, and the Philippines. Using annual data from 2001 to 2020, a static panel data regression model is employed. The empirical results reveal that at least two independent variables significantly impact inflation rates in these five ASEAN nations. Specifically, the unemployment rate has a significant negative correlation with inflation fluctuations, while economic growth shows a significant positive correlation. Overall, this study provides valuable insights into how exchange rate determinants influence inflation fluctuations, highlighting the importance of balanced policies to address the interactions between unemployment, economic growth, and inflation.

Keywords: *Inflation Fluctuations, ASEAN-5 Countries, Unemployment Rate, Economic Growth, Exchange Rate Determinants*

1. Introduction and Background

Inflation remains a persistent challenge for the global economy, impacting both developed and developing countries. In recent years, factors such as supply chain disruptions, volatile energy prices, geopolitical instability, and unconventional monetary policy responses to crises like the COVID-19 pandemic have intensified global inflationary pressures (Hernández et al., 2024). It's important to recognize that different regions are affected at varying rates due to disparities in economic development and global market volatility. Rising inflation can lead to lower savings rates, a particular concern for individuals who rely on their savings to sustain their current lifestyle without a minimum return on investment. Conversely, those with limited savings and low incomes may increasingly turn to debt to cover their expenses (Dany-Knedlik & Garcia, 2018; Yusuf et al., 2021). Ultimately, inflation impacts everyone.

In response to rising inflation, advanced economies have implemented stricter monetary policies (Hernández et al., 2024). As a result, a short- to medium-term tightening of monetary policy is anticipated in these regions, driven by high inflation rates and surging commodity prices. This implies that developing economies may resort to additional borrowing to manage their inflationary pressures. Nonetheless, despite difficult local and global macroeconomic conditions, monetary authorities in emerging market economies have also introduced their own policy measures.

Table 1: Inflation Rate in ASEAN-5 Countries from 2014 to 2023

Years	Countries				
	Malaysia	Indonesia	Philippines	Thailand	Singapore
2014	3.14	6.39	3.60	1.90	1.03
2015	2.10	6.36	0.67	-0.90	-0.21
2016	2.09	3.53	1.25	0.19	-0.53
2017	3.87	3.81	2.85	0.67	0.58
2018	0.88	3.20	5.31	1.06	0.44
2019	0.66	3.03	2.39	0.71	0.57
2020	-1.14	1.92	2.39	-0.85	-0.18
2021	2.48	1.56	3.93	1.23	2.30

2022	3.38	4.21	5.82	6.08	6.12
2023	2.49	3.67	5.98	1.23	4.82

Source: World Bank

This study focuses on the ASEAN-5 nations—Indonesia, Malaysia, the Philippines, Thailand, and Vietnam emphasizing the significant impact of both domestic and external factors on their inflation dynamics. Inflation poses a particularly complex challenge for these countries, given their varying levels of trade dependence, economic development, and policy frameworks. While inflation trends in these nations reflect global patterns, they also exhibit distinct regional characteristics. Over the past two decades, the ASEAN-5 has undergone significant changes in inflation dynamics, marked by peaks, volatility, and the adoption of inflation-targeting policies, a common practice in emerging economies.

Since the early 2000s, persistent inflationary pressures have impeded the economic growth of these nations. Although the Global Financial Crisis (GFC) was expected to exert strong deflationary forces, monetary adjustments became more challenging after the sharp drop in oil prices in 2014. This is particularly crucial for ASEAN countries, as inflation diminishes purchasing power and drives up general price levels (Yusof et al., 2021). The economic prospects of each ASEAN nation will depend on the impact of national inflation, which can have both positive and negative effects. However, a moderate inflation rate is generally a sign of a healthy economy.

A country's inflation rate is measured by the annual percentage change in the Consumer Price Index (CPI), making it a critical indicator for guiding national economic policy (Dany-Knedlik & Garcia, 2018). In the ASEAN region, all countries experience fluctuations in inflation, impacting the cost of living, economic growth, national spending, and monetary policy decisions. Research consistently highlights that maintaining inflation at manageable levels is key to promoting economic progress, with the primary fiscal goal being to control inflation (Yusof et al., 2021). Furthermore, currency depreciation plays a significant role, as it undermines investor confidence and discourages investment when inflation increases.

Yusof et al. (2021) note that while inflation presents challenges to ASEAN's economic growth, policymakers believe that maintaining a low inflation rate can support the region's economic objectives. When a low inflation rate and stable purchasing power are achieved, economic growth is not adversely affected in the long term. Additionally, the strong two-way relationship between inflation and economic growth helps keep inflation low and stable (Abraham & Camba, 2021). This study, therefore, aims to examine the relationship between inflation fluctuations, indicated by rising overall price levels, and various economic indicators in several Asian countries, including Malaysia, India, Indonesia, Singapore, the Philippines, and Vietnam. Specifically, the study will assess the impact of the unemployment rate, exchange rate, economic growth, money supply growth, and government expenditure on inflation fluctuations.

This paper offers several contributions to the existing literature. First, it expands research on the determinants of inflation by focusing on the ASEAN region. Second, while much of the previous research has been country-specific, such as studies on the Middle East and North Africa (Ghanayem, Downing, & Sawalha, 2023), developing countries (Ghosh, 2023), South Asia (Zakaria, Khiam & Mahmood, 2021) and GCC countries (Kandil & Morsy, 2011), this paper takes a regional approach. Third, past studies have primarily examined the effects of inflation on variables such as GDP (Adaramola & Dada, 2020), FDI (FoEh, Suryani & Silpama, 2020) and exchange rates (Ha, Stocker & Yilmazkuday, 2020), with limited focus on its determinants (Chong, Tang & Yap, 2023). This study builds on these findings by exploring the factors driving inflation fluctuations in the ASEAN region. Notably, there is limited knowledge about the extent to which macroeconomic variables influence inflation determinants. Thus, this paper provides new empirical evidence, highlighting how key internal macroeconomic variables impact inflation rates in ASEAN countries.

The rest of the paper is structured as follows. The next section presents a review of prior research on inflation within the ASEAN region. Following this, the theoretical framework underlying the analysis is discussed, along with the related hypotheses. The third section details the research methodology, including sampling and data analysis procedures. The fourth section presents and discusses the key findings along with additional analyses.

Finally, the sixth section concludes with the study's conclusions, implications, and limitations, and proposes directions for future research.

2. Literature Review

Keynesian Theory of Inflation

According to the Post Keynesian perspective, inflation is driven more by cost factors than by fluctuations in demand. These cost factors include commodity prices, import prices, mark-ups, and wages, which can account for inflation (Bloch, Dockery & Sapsford, 2004). Wage money refers to the compensation a person receives for their work. This theory posits that inflation results from a decrease in aggregate supply. Additionally, four main causes of inflation are identified: diminishing returns, rising profit margins, and an increase in money wages that outpace both productivity and import prices. Diminishing returns lead to higher output costs for firms, arising from the hiring of less skilled and less efficient capital equipment operators. This trend has become a notable phenomenon, significantly contributing to the rise in supply prices before employment (Bloch, Dockery & Sapsford, 2004).

This inflationary trend cannot be halted or altered in the short term if output continues to rise under conditions of diminishing returns. However, it may be mitigated in the long run through improvements in training programs, enhanced capital utilization per worker, and advancements in technology. Profit inflation, on the other hand, focuses on the rise in gross profit margins. It is linked to the overall monopolization of the economy and is not necessarily connected to changes in aggregate demand. Nevertheless, a diminishing price elasticity of demand can lead to increased profit margins alongside output growth (Bloch et al., 2004). Additionally, price-push inflation, also known as administered price inflation, arises from the need to raise the prices of goods to compensate for rising production and labor costs, ultimately aiming for higher profits (Totonchi, 2011).

Wage inflation refers to an increase in wage rates that does not align with productivity gains, while profit margins remain stable. A decrease in unemployment gives workers the leverage to negotiate higher wages than before. In the Post Keynesian perspective, this type of inflation is not linked to changes in the level of aggregate output; instead, the overall wage dynamics within the economy play a significant role in driving inflation. According to Post Keynesian theory, wage inflation is viewed as a primary contributor to overall inflation. Additionally, import inflation can impact the inflation rate within an economy. For instance, if a country's currency depreciates, it can lead to higher import prices, consequently raising the inflation rate. Conversely, an appreciation of the currency may lower import prices and alleviate inflationary pressures. The post-Keynesian theory is often overlooked but deserves more attention for its insights into these dynamics.

Demand-Pull Theory of Inflation

According to John Maynard Keynes, the primary cause of demand-pull inflation is an increase in aggregate demand, which comprises government spending, consumption, and investment. Demand-pull inflation arises when aggregate demand surpasses aggregate supply at full employment. This situation, where full resources are utilized alongside rising prices, is referred to as an inflationary gap. The larger the gap between aggregate demand and aggregate supply, the more rapidly inflation tends to rise. Additionally, a decline in the purchasing power of assets such as money and wages contributes to heightened inflation. Keynes suggests that reducing inflation and demand pressures is an effective policy approach to managing aggregate demand. This can be achieved through measures such as controlling the money supply and increasing taxes on government spending to decrease demand and help control inflation.

Monetary Theory of Inflation

The founders of the monetarist school of thought asserted that "only money matters" and believed that monetary policy is more effective than fiscal policy in stabilizing the economy. According to the theory of monetary inflation, the general price level in an economy is influenced not by the price of goods or the money supply but rather by employment levels and the unemployment rate, especially when the economy has not yet achieved full employment. In the short term, prices can affect output, whereas, in the long term, they do not have the same effect on the money supply. The quantity theory states that "inflation is always and everywhere a monetary phenomenon." Najihah Yusof (2021) analyzed data and concluded that the money supply is the primary driver of inflation in the short term, while the relationship between money growth and inflation is

positively correlated in the long term, aligning with monetarist principles.

This research examined the unemployment rate, exchange rate, economic growth, money supply, and government expenditure as independent variables. The selection of these explanatory variables is based on findings from previous studies.

Unemployment Rate (UNE) and Inflation

Maximova (2015) argued that unemployment and inflation are critical elements of a market economy. Their research examined the relationship between unemployment and inflation in Russia from 1999 to 2007, reflecting the country's economic situation. The results indicated an inverse relationship between unemployment and inflation in Russia, suggesting that these two factors have historically been interconnected. Most economists believe there is a significant negative correlation between inflation and unemployment, meaning that an increase in the unemployment rate tends to result in a decrease in inflation. Similarly, Wulandri et al. (2019) noted that a rising unemployment rate could lead to a reduction in inflation levels and potentially result in a recession.

This research examines the relationship between the unemployment rate and inflation in Indonesia from 1986 to 2018, utilizing a causality method to investigate this connection. The findings reveal a significant negative relationship between the unemployment rate and inflation, indicating that an increase in the unemployment rate leads to a decrease in inflation. In contrast, Tenzin (2019) noted that various studies across different economies have explored the interplay between unemployment, economic growth, and inflation. Their research focused on the relationship between the unemployment rate and inflation from 1998 to 2016, demonstrating a significant positive relationship. Consequently, an increase in the unemployment rate is associated with a rise in inflation.

Additionally, Edvin (2020) identified a correlation between the unemployment rate and inflation in Sweden from 1996 to 2019, using data from the SCB database. The research employed regression tests for analysis. The results indicated a negative relationship between unemployment and inflation during this period, aligning with Phillips's theory. This suggests that low unemployment is associated with high inflation, while high unemployment corresponds to low inflation.

Finally, Omran and Bilan (2021) conducted a comprehensive study on the relationship between unemployment and inflation in Egypt from 1980 to 2019. Their findings revealed a significant negative correlation between Egypt's unemployment rate and inflation, which also supports the classic Phillips curve. This implies that an increase in the unemployment rate may lead to lower inflation rates. Overall, this research indicates a notable negative relationship between the two variables.

Based on the various studies mentioned, it can be concluded that most past research has reported a negative relationship between the unemployment rate and inflation: as the unemployment rate decreases, the inflation rate tends to increase. Thus, the following hypotheses are proposed:

Null Hypothesis (H0): There is no relationship between the unemployment rate and fluctuations in the inflation rate.
Alternative Hypothesis (H1): There is a relationship between the unemployment rate and fluctuations in the inflation rate.

Exchange Rate (EXR) and Inflation

Madesha et al (2013) noted that in a floating exchange rate system, fluctuations in the exchange rate can significantly impact price levels. On the aggregate supply side, a depreciation of the domestic currency can affect the price level directly through the cost of imported goods that domestic consumers purchase. A depreciated exchange rate increases input costs, which in turn raises manufacturing expenses. Consequently, manufacturers are likely to increase the prices of goods that consumers pay. Numerous studies have investigated the relationship between exchange rates and inflation.

Furthermore, Sanam and Fetullah (2017) assessed the critical relationship between exchange rates and

inflation, particularly in emerging economies. Their research found a positive relationship and strong correlation between the two variables, indicating that an increase in the exchange rate can lead to higher prices for imported goods. Similarly, Setiartiti and Hapsari (2019) conducted an empirical study on the relationship between exchange rates and inflation in Indonesia. Their findings demonstrated a positive correlation, suggesting that an increased likelihood of currency depreciation contributes to inflationary pressures. Conversely, a depreciation of the domestic currency could result in lower inflation.

In another study, Charles and Chilaka (2019) analyzed the impact of exchange rates on inflation in Nigeria from 1981 to 2015. They found a positive relationship between the exchange rate and inflation, which contributed to the country's persistent inflation. Therefore, a rising currency value ultimately leads to import inflation and higher prices for imported goods. A recent study by Alieu (2019) examined the relationship between inflation and the exchange rate in Gambia from 1978 to 2016. This research revealed a negative relationship, as fluctuations in Gambia's currency directly influenced import and export pricing. Thus, a decline in the nominal exchange rate tends to result in higher inflation.

Meanwhile, Kayamo (2021) investigated the relationship between inflation and the exchange rate in Ethiopia from 1982 to 2019. The study found a significant negative relationship, indicating that an increase in the exchange rate leads to a decrease in the inflation rate. Based on the various studies mentioned, it can be concluded that most past research has reported a positive relationship between exchange rates and inflation: as the exchange rate rises, inflation tends to increase. Therefore, the following hypotheses are proposed:

Null Hypothesis (H0): There is no significant relationship between the exchange rate and fluctuations in the inflation rate.
Alternative Hypothesis (H1): There is a significant relationship between the exchange rate and fluctuations in the inflation rate.

Economic Growth (GDP) and Inflation

Gokal and Hanif (2004) conducted a study on Fiji, revealing both positive and negative correlations between economic growth and inflation. The authors analyzed time series data from 1970 to 2003 using the Vector Auto-regression Model (VAR). Their findings indicated that, in the short term, inflation negatively impacts economic growth, while in the long term, economic growth positively influences inflation. Stagflation, in economic terms, refers to a scenario where inflation rises while output remains stable or declines.

Next, Khattak, Muhammad and Iqbal (2014) emphasized the need to reassess the key factors contributing to Pakistan's high inflation rate, which adversely affects the overall welfare of its citizens. Their research covered the period from 1980 to 2002, using Johnson’s Co-integration model to analyze the data. The results demonstrated a significant positive relationship between income distribution and inflation concerning economic growth. They noted that unequal wealth distribution negatively affects income development and is contingent on per capita economic growth rates.

Furthermore, Dinh (2019) analyzed the relationship between nominal inflation and economic downturns, referencing the theory of monetary quantity. The study examined time series data from 2012 to 2016 and found that most researchers indicated a positive relationship between money supply and inflation in relation to economic growth. However, this relationship is interactive rather than one-dimensional; to achieve high economic growth, some inflation must be accepted. Galloping inflation or hyperinflation can severely hinder economic growth. While inflation often has a significant positive impact on a country’s economy, some economies have faced downturns due to inflationary pressures.

Additionally, Panigrahi et al. (2020) investigated the relationship between economic growth and inflation in five ASEAN countries (Malaysia, Indonesia, Thailand, Singapore, and the Philippines) from 1995 to 2018. They employed the Johansen Cointegration Test and Granger's test of causality, concluding that inflation rates are related to economic growth. Specifically, low inflation rates are positively correlated with economic growth, with minimal inflationary effects on growth. The research also suggested that economic growth could be enhanced by lowering interest and inflation rates, prompting economists and policymakers to implement appropriate micro- and macroeconomic measures to influence economic output.

Lastly, Louangrath (2022) examined the challenges posed by inflation on ASEAN economies and its impact on economic growth. This research utilized an autoregressive model to predict inflation and its effects, considering ERPT and Prospect Theory. The findings indicated a negative relationship between the economic growth rate and the inflation rate, based on a time series analysis of ten countries from 2011 to 2022. The study concluded that following the COVID-19 pandemic, inflation does not pose a significant threat to economic growth because the influence of international trade, denominated in US dollars, may not directly affect local economies due to varying currencies and exchange rates.

Based on the various studies mentioned, it can be concluded that most past research has reported a positive relationship between economic growth and inflation, suggesting that if the exchange rate increases, inflation will also rise. The following hypotheses are proposed:

Null Hypothesis (H0): There is no relationship between economic growth and fluctuations in the inflation rate.
Alternative Hypothesis (H1): There is a relationship between economic growth and fluctuations in the inflation rate.

Money Supply (MS) and Inflation

Ovamba and Ouma (2018) assert that monetarists believe the growth rate of the money supply is the main driver of inflation, and a rapid increase in the money supply can lead to a significant rise in inflation. The findings indicate that there is a substantial positive correlation between Kenya's money supply and inflation, with the money supply identified as a key determinant of inflation in the country. Consequently, this research adds to the existing literature by supporting monetarist theory and recommends that the Kenyan government maintain strict monetary policies focused on broad money to control inflation.

Additionally, James, Felican and Robert (2014) identify the primary causes of inflation, according to basic economic principles, as increases in credit and excess money supply. Typically, the implementation of fiscal and monetary policies leads to rising inflation. Thus, the money supply has a direct and significant effect on inflation; a one percent increase in inflation will increase the money supply. Based on their findings, the central bank should avoid manipulating the money supply to create artificially low interest rates in the economy.

Furthermore, Ditimi, Keji and Emma (2018) note that economic theory attributes inflation to growth in the money supply. As the money supply increases, so do the prices of goods and services, particularly when output growth approaches its maximum potential, which tends to create inflationary pressures. Although the money supply in Nigeria showed a negative but insignificant relationship with inflation, the government should consider implementing additional measures that contribute to inflation, such as raising interest rates and domestic fuel prices, to achieve lower inflation rates.

Meanwhile, Md. Nezum, Mohammed and Monir (2019) suggest that excessive money printing and circulation often lead to increased production costs and a decline in currency value. Their research indicates that the money supply does not affect inflation, but rather that there is a significant positive relationship between the two; an increase in money supply will consequently lead to an increase in inflation.

Atif (2021) highlights that numerous theories have been proposed in economic literature to explain inflation. According to Friedman & Schwartz (1963), some scholars advocate the view that "inflation is a purely monetary phenomenon," suggesting that inflation arises from an increase in the money supply. As a result, there is a significant correlation between money supply and inflation, indicating that the money supply drives inflation in Jordan.

Based on the above review, it can be concluded that most past studies have reported a significant positive relationship between money supply and inflation. This supports the notion that an increase in the money supply leads to an increase in inflation. The following hypotheses are proposed:

Null Hypothesis (H0): There is no significant relationship between the money supply and fluctuations in the inflation rate.
Alternative Hypothesis (H1): There is a significant relationship between the money supply and fluctuations in

the inflation rate.

Government Expenditure (GOV) and Inflation

Hasnul (2015) suggests that inflation has a minimal impact on government expenditure. This study analyzes disaggregated government spending in Malaysia, differentiating between operating and development expenditures across various sectors over a 45-year period from 1970 to 2014. Using the Ordinary Least Squares (OLS) technique, the researchers examine the fixed effects of government expenditure on economic growth. The findings indicate a negative correlation between overall government expenditure and inflation in Malaysia during this extensive timeframe. Consequently, an increase in government expenditure may lead to lower inflation rates, demonstrating a significant negative relationship between inflation and government spending.

Similarly, Mehraraa et al. (2016) found that government expenditure did not directly contribute to inflation from 1990 to 2013. Using a Smooth Transition Regression Model, this research investigated the relationship between inflation and government spending. The results revealed a significant negative relationship, indicating that increases in government expenditure have a limited impact on inflation.

In addition, Senawi & Che Sulaiman (2020) stated that government spending significantly contributes to national development across various sectors. This research examined the effects of government expenditure on Malaysia's inflation from 1980 to 2017, employing Descriptive Analysis and the Autoregressive Distributed Lag (ARDL) Model. The findings indicate a significant relationship between the inflation rate and government spending in health, education, transportation, and defense, suggesting that increases in government expenditure in these sectors can lead to higher inflation rates.

Shifaniya (2022) noted that inflationary pressures on the economy stem from rising government expenditure. This research examined the relationship between government spending and inflation in Sri Lanka and India from 1977 to 2019, utilizing the ARDL Co-integration, Bounds test, Error Correction version of the ARDL model, and the Granger Causality test. The findings highlighted a statistically significant positive relationship between government expenditure and inflation in both countries, suggesting that an increase in government spending leads to higher inflation rates, indicating an adjustment toward equilibrium.

Based on the various studies reviewed, it can be concluded that the majority of past research indicates a positive relationship between inflation and government expenditure; as government spending increases, inflation tends to rise as well. The following hypotheses are proposed:

Null Hypothesis (H0): There is no significant relationship between government expenditure and fluctuations in the inflation rate.
Alternate Hypothesis (H1): There is a significant relationship between government expenditure and fluctuations in the inflation rate.

3. Research Methodology

The sample used in this study included inflation rate data spanning 20 years, from 2001 to 2020. This paper employed panel data analysis and incorporated secondary data, which consisted of independent variables such as the unemployment rate, exchange rate, economic growth, money supply, and government expenditure. The study focused on the ASEAN-5 countries, namely Malaysia, Singapore, Thailand, the Philippines, and Indonesia. The data was sourced from the World Bank database, as detailed in Table 2.

Table 2: The Summary of Measurement for Variables

Variables	Proxies	Notations	Measurements	Sources of Measurement
1. Inflation Rate	Customer Price Index (%)	CPI	$\frac{Ct}{C0} \times 100$	The World Bank
2. Unemployment Rate	Unemployment rate (%)	UNE	$\frac{Number\ of\ Unemployed}{Labour\ Force} \times 100$	The World Bank
3. Exchange Rate	Exchange Rate (RM)	EXR	$\frac{Home\ Currency}{Foreign\ Currency}$	The World Bank
4. Economic Growth	Gross Domestic Product (%)	GDP	Y= C+ I + G+ (X-M)	The World Bank
5. Money Supply	Broad Money (M2)	MS	(M2) = M1 +Savings Deposits +Time Deposits +Other Nears - Money Assets	The World Bank
6. Government Expenditure	General government final consumption expenditure (RM)	GOV	G = Y - C - I - (X -M)	The World Bank

4. Results

This section presents the descriptive statistics of the variables related to the inflation rate, based on 20 observations from 2001 to 2020. The descriptive analysis covers inflation (CPI), unemployment rate (UNE), exchange rate (EXR), economic growth (GDP), money supply (MS), and government expenditure (GOV). In addition to the descriptive analysis, Correlation Coefficient Analysis and Static Panel Regression are utilized to examine the relationships between the inflation rate and the independent variables.

Table 3: Descriptive Statistics

	CPI (%)	UNE (%)	EXR (RM)	GDP (RM)	MS (RM)	GOV (RM)
Mean	3.137900	3.571700	2195.803	1.56E+15	6.27E+14	1.43E+14
Maximum	13.11000	8.060000	14582.20	1.58E+16	6.91E+15	1.49E+15
Minimum	-1.140000	0.250000	1.250000	1.61E+11	1.80E+11	1.87E+10
Std. Dev.	2.820221	1.711883	4467.428	3.80E+15	1.52E+15	3.52E+14

Note: CPI= Inflation, UNE= Unemployment Rate, EXR= Exchange Rate, GDP= Economic Growth, MS= Money Supply and GOV= Government Expenditure

As shown in Table 3, the Money Supply (MS) reached its maximum value of RM69,059,400 billion in Indonesia in 2020. According to Bank Indonesia, this peak was largely influenced by the Christmas and New Year celebrations. Overall, the data reflects a significant increase in Indonesia's money supply during December 2020, driven by seasonal factors. In contrast, the Consumer Price Index (CPI) recorded its minimum value of -1.14% in Malaysia for the same year. This low CPI in Malaysia can be attributed to various factors, particularly the effects of the COVID-19 pandemic. 2020 marked a peak year for COVID-19, leading to reduced demand as

movement restrictions and lockdowns curtailed consumer spending, especially in areas like travel, dining, and entertainment. Additionally, the global oil price crash in 2020 significantly lowered fuel costs, which in turn affected transportation and energy-related expenses, contributing to the overall decline in inflation.

The raw data reveals that the highest standard deviation is associated with GDP, which stands at 3.80E+15, with a mean of 1.56E+15. This indicates that the GDP per capita data is widely dispersed across a range of values. The significant difference between the mean, maximum, and minimum GDP per capita values illustrates this variability. Year-to-year fluctuations are substantial, resulting in a high standard deviation. GDP serves as a comprehensive measure of economic activity, encompassing numerous sectors and industries, each with its dynamics and contributions to inflation. This can lead to considerable variations in overall GDP growth, thereby contributing to the elevated standard deviation. Such fluctuations may be influenced by various external factors, including natural disasters or the impact of the COVID-19 pandemic.

In contrast, the unemployment rate variable (UNE) exhibits the lowest standard deviation at 1.711883, with a mean of 3.571700. This suggests that the unemployment rate is closely clustered around the mean, indicating greater reliability of the data. The year-to-year changes are minimal, leading to a smaller standard deviation. This clustering is reflected in the mean, minimum, and maximum values, which demonstrate less variability and fewer extreme values. These findings can be further elucidated by examining the raw data collected for this study.

Table 3: Correlation Coefficient Analysis

VARIABLES	CPI	UNE	EXR	GDP	MS	GOV
CPI	1	0.4747	0.5278	0.2735	0.2763	0.2585
UNE		1	0.5214	0.2970	0.2999	0.2828
EXR			1	0.9094	0.9125	0.9008
GDP				1	0.9980	0.9990
MS					1	0.9979
GOV						1

CPI= Inflation, UNE= Unemployment Rate, EXR= Exchange Rate, GDP= Economic Growth, MS= Money Supply M2 and GOV= Government Expenditure

The correlations among the variables are presented in Table 3, with a cut-off point established at 0.8 for this study. As indicated in the table, most correlation values fall below this threshold, except for those between the exchange rate (EXR) and GDP, EXR and money supply (MS), and EXR and government expenditure (GOV). Specifically, EXR shows a strong correlation with GDP, MS, and GOV, with values of 0.9094, 0.9125, and 0.9008, respectively. Additionally, the correlations between GDP and MS, as well as GDP and GOV, exceed the cut-off point, suggesting a significant relationship with correlation values of 0.9980 and 0.9990. Furthermore, the correlation between MS and GOV is also above the cut-off point, reflecting a strong correlation of 0.9979 between these two variables.

Table 4: Static Panel Regression

DEPENDENT VARIABLE: INFLATION						
	POLS			FEM		
Independent Variables	Coefficient	T-stat	Prob	Coefficient	T-stat	Prob
UNE	-0.807732	-1.762620	0.0818	-0.540131	-1.145203	0.2554
EXR	0.000944	1.248507	0.2155	0.000462	0.659723	0.5112
GDP	24.36059	2.763976	0.0071	27.05872	2.722502	0.0079
MS	7.998627	0.642830	0.5222	6.806860	0.632853	0.5285
GOV	-0.273471	-0.028501	0.9773	2.693719	0.285396	0.7760

R-squared	0.165460	0.142842
Adjusted R-squared	0.071574	0.091821
F-statistic	1.762352	2.799662
Prob (F-statistic)	0.088587	0.021803
Durbin-Watson stat	2.892472	2.743535
Prob (Wald F-statistic)	0.0337	
Wald F-statistic	2.411202	
Redundant Fixed Effect	0.1620	

Note: CPI= Inflation, UNE= Unemployment Rate, EXR= Exchange Rate, GDP= Economic Growth, MS= Money Supply and GOV= Government Expenditure, POLS= Pooled Ordinary Least Square, FEM= Fixed Effect Model, T-stat= T-statistic, Prob= Probability

As shown in the Table above, POLS and FEM reported an adjusted R2 of 7.16% and 9.62% respectively. The adjusted R2 in POLS and FEM indicates that only 7.16% and only 9.62% of the variation in dependent variables can be explained by the independent variable in this study. The remaining 92.84% in POLS and 90.38% in FEM are explained by other independent variables which are omitted from the regression models. The F-statistic of 1.76 and 2.89 for POLS and FEM, respectively indicate that the models are fit as the F-statistics are significant at 10% and 1% respectively level. Both models are also free from autocorrelation and multicollinearity.

Referring to the Redundant Fixed Effect, the likelihood result which explains whether POLS or FEM is the appropriate model indicates that POLS is the best model due to the p-value being 0.1620. Therefore, the Pooled Ordinary Least Square Model is a valid model to explain the "Factors That Influence the Fluctuation of Inflation Rate in Five ASEAN Countries". In conclusion, the estimation of static panel data can be expanded problems arise. In this study, F-statistics has been used to test the null hypothesis which is composed of multiple hypotheses. It shows that the F-statistic is 1.762352 respectively, which indicates that the regression model's fit as the F-statistic is significant at level 0.1 (1%). The table shows that approximately an adjusted r-square is 7.15% of the variation in the model could be explained by the significant variables used in this research. The remaining 92.85% of the variation in the dependent variable was explained by other variables that are not included in this research and omitted from the regression model.

Referring to the p-value (Prob.) at 0.0071, it shows that GDP has a highly significant influence on inflation provided that the threshold value is at 0.01, and the GDP has a confidence level of 99%. Therefore, UNE shows the p-value (Prob.) at 0.0818 also has a high significant influence on inflation value is at 0.1, the UNE has a confidence level of 90%. This can be seen from the regression table, the outcomes show that only $H0_2$, $H0_4$ and $H0_5$ are not supported and will be rejected while $H0_1$ and $H0_3$ are supported. The Wald test is being used to test the null hypothesis that the coefficients of the six regressors in the POL'S equation are all equal to zero. The prob value for the test is 0.0337 and the F-statistic for the Wald test is 2.411202. It shows the null hypothesis was rejected at the 5% significant level. The VIF scores for all five independent variables are less than 5, it is evidence that there is no severe multicollinearity, and they can remain in the panel-data model.

Discussion

Based on the findings, it shows that the p-value (Prob.) for the unemployment rate (UNE) is 0.0818. It significantly supports the proposition of this research that UNE is more influential on inflation at a 10% level making UNE have a confidence level of 90%. Therefore, unemployment rate and inflation are proven to be negatively related with each 1 unit of change on the unemployment rate, inflation will have an inverse effect at 0.807732. Hence, the hypothesis statement (H0) is not to be accepted. From the past study of Maximova (2015), bringing inflation under control is becoming a prior goal. Indicating high unemployment results in low inflation and conversely, low unemployment leads to high inflation and will have an impact on determining the rising price of basic commodities and fuel. However, the significantly high confidence level shows that with policies to bring inflation under control, the demand for goods and services in the economy decreases. As the aggregate demand for goods and services in the economy decreases, the demand for the workforce decreases as well. Using the demand-pull theory inflation can occur when aggregate demand exceeds aggregate supply at full employment.

Next, the economic growth (GDP) is 0.0071 for the p-value (Prob.) significantly which supports the proposition of this research that ECO is more influential on inflation at 1% level that makes UNE have a confidence level of 99%. Therefore, economic growth and inflation are proven to be positively related with each 1 unit of change on the economic growth, inflation will have an effect at 24.36059. This can be seen from the coefficient section in the regression table. Hence, the hypothesis statement (H0) is not to be accepted. Louangrath (2022) shows that an increase in the rate of economic growth means more goods for money to "chase," which puts downward pressure on the inflation rate that influences micro- and macroeconomics. However, based on monetary theory, the unequal income distribution of wealth will affect the development of income and it will depend on the rates of per capita economic growth that can affect inflation.

The exchange rate result for p-value (Prob.) is 0.2155 which is higher than 0.05 and it indicates insignificant with the dependent variable. Therefore, exchange rate and inflation are proven to be positively related with each 1 unit of change on the exchange rate, inflation will have an inverse effect at 0.000944. This can be seen from the coefficient section in the regression table. Hence, the null hypothesis (H0) is accepted. This can be supported by the research by Setiartiti & Hapsari (2019), indicating that the exchange rate has an insignificant effect on inflation. The insignificance also can be caused by a condition when economic pass-through complexities even though the short-term interest rate may encounter significant performance difficulties in monetary policy.

The money supply results for p-value (Prob.) is 0.5222 which is higher than 0.05 and it indicates insignificant with the dependent variable. Therefore, money supply and inflation are proven to be positively related with each 1 unit of change on the money supply, inflation will have an inverse effect at 7.998627. This can be seen from the coefficient section in the regression table. Hence, the null hypothesis (H0) is accepted. According to Ditimi, Keji and Emma (2018), the result shows the money supply's insignificant relationship with inflation in Nigeria. This is because, in Nigeria, the cause of high inflation is raising interest rates and the price of domestic fuel. The positive coefficient can be supported from the demand-pull theory of inflation stating that measures to restrict the money supply and raise taxes on government expenditure can lower demand and control inflation, while reducing inflation and demand pressure is an effective way to lower the aggregate demand component.

The government expenditure results for p-value (Prob.) is 0.9773 which is higher than 0.05 and it indicates insignificant with the dependent variable. Therefore, government expenditure and inflation are proven to be negatively related with each 1 unit of change on the government expenditure, inflation will have an inverse effect at 0.273471. This can be seen from the coefficient section in the regression table. Hence, the null hypothesis (H0) is accepted. This can be supported by the research by Hasnul (2015), revealing a negative correlation between overall government expenditure in Malaysia during this extensive timeframe for the last 45 years. Hence an increase in government expenditure may be resulting in low-rate inflation.

5. Managerial Implications and Recommendations

This research contributed to policymakers' insight into how or what determinants of exchange rate significantly affect the fluctuation of inflation rate in the five chosen countries. This research provides essential insights into the relationship between the significant variables and the dependent variables. For example, there is also a significant and positive relationship between economic growth and inflation. Economic growth has been increasing consistently in Malaysia. The positive relationship indicates that as the economy grows, inflation tends to rise. Policymakers need to be cautious about stimulating economic growth excessively, as it might lead to higher inflation.

This research also serves as a guideline and becomes of significant relevance to investors and financial decision-makers. This information may guide prospective direct investors or companies from Europe or the Middle East seeking to invest in ASEAN countries. Besides that, the positive relationship between the unemployment rate and inflation could have a significant influence on investors. When unemployment rates increase, inflation will rise as well. Investors should consider the economic environment when making investment decisions.

Furthermore, the positive and significant relationship between economic growth and inflation could also contribute to investors' decision-making. When economic growth accelerates, inflation will rise. Investors may interpret a positive relationship between economic growth and inflation as an opportunity for investment. However, they should be mindful of the potential risks associated with higher inflation, such as interest rate hikes.

This research also holds significant relevance in the field of economics because it sheds light on several critical aspects of economics and theory. This is because it allows economists to go through the underlying causes and mechanisms that drive economic growth and inflationary pressures within an economy. For example, if there is a positive relationship between economic growth and inflation, economists can analyze the implications of the positive relationship between economic growth and inflation for long-term economic sustainability. This can inform discussions on the appropriate level of economic stimulus.

Apart from the significance of this research to policymakers, potential investors and economists, this research also contributes to the consumers. This can be explained as the unemployment rate influenced the inflation. There is a significant and positive relationship between the unemployment rate and inflation. Consumers may need to be aware that it can lead to reduced purchasing power. Understanding these economic dynamics can help consumers make informed financial decisions. There is also a positive and significant relationship between economic growth and inflation. Consumers may benefit from economic growth, but they should also be prepared for potential increases in prices. It underscores the importance of financial planning and being aware of inflationary pressures.

As for recommendations, it would be advisable for future researchers to expand their samples of studies to other broader regions such as Southeast Asia to obtain more holistic views of findings, or maybe conduct the study by comparing developed and developing countries. It is also recommended for future research to include other superior panel estimation methods such as the panel generalized method of moments (GMM) method to obtain more robust results and to investigate the variables that might react differently to the fluctuation of the Inflation rate in the ASEAN region.

Conclusion

The objective of this study the factors that influence the fluctuation of the inflation rate in five ASEAN Countries from the year 2001 until 2020. Using the static panel regression model, it found that the unemployment rate and economic growth are significant in the fluctuation of the inflation rate. Independent variables have a positive influence on the CPI, which shows that an increase in the unemployment rate and economic growth will increase the inflation rate. On the other hand, exchange rate, money supply and government expenditure do not have a significant relationship with the inflation rate.

Overall, the results highlight the significance of monetary policy in developing economies when it comes to achieving the goal of stabilizing consumer price inflation. This finding suggests that supply chain pressures create an additional obstacle for central banks in meeting their inflation targets. As a result, it may take longer and potentially require more stringent monetary policy measures to impact consumer prices.

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Exploring the Relationship between Individual Information Technology Ethics and Netizenship Behaviors

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Abstract: In the digital age, information technology (IT) ethics plays a critical role in shaping netizenship behavior within online communities. This concept paper examines the relationship between individual IT ethics and netizenship behavior and emphasizes how ethical principles guide responsible and constructive participation in digital spaces. Based on theoretical frameworks such as the Theory of Planned Behavior (TPB) and Digital Citizenship, the article examines the influence of ethical IT practices on positive netizenship, including factors such as digital literacy, hierarchical influence and cultural or religious values. The review shows that people with strong IT ethics are more likely to engage in responsible online behavior, promoting healthier digital environments. By identifying gaps in the existing literature, the paper proposes a conceptual model to guide future empirical research on how ethical IT use influences digital citizenship. The findings highlight the importance of promoting IT ethics and digital literacy to improve online interactions and contribute to more engaged, respectful and responsible digital communities.

Keywords: *Information technology, Netiquette, Netizenship, Islamic work ethics.*

1. Introduction and Background

In the rapidly advancing digital age, the proliferation of information technology (IT) has fundamentally reshaped how individuals interact, communicate, and engage with each other globally. Digital platforms such as social media, forums, and collaborative online tools have become essential in the personal, professional, and educational spheres. This shift has led to the emergence of "netizenship," a term denoting individuals' roles as citizens of the internet. Much like traditional citizenship, netizenship comes with responsibilities, where individuals are expected to adhere to ethical norms that ensure the well-being and functionality of digital communities (Floridi, 2019).

As online interaction expands, new ethical challenges emerge. These challenges include privacy breaches, cyberbullying, the dissemination of misinformation, and violations of intellectual property rights, all of which have become increasingly prevalent. Such issues raise serious concerns about how individuals navigate the ethical complexities of digital spaces (Dahlberg, 2020). Information technology ethics (IT ethics) offers a framework that guides individuals in responsibly interacting with technology. These ethical guidelines cover various dimensions, including protecting personal privacy, ensuring data security, respecting intellectual property, and maintaining respectful online behavior (Floridi, 2019). The implementation of IT ethics is crucial for establishing a digital environment that fosters trust, safety, and positive engagement (Gomes, 2021).

Despite increasing recognition of IT ethics, the specific ways in which adherence to these principles influences netizenship behavior are not yet fully understood. Netizenship behavior encompasses how individuals contribute to and interact within online communities, often shaped by their ethical stances. Positive netizenship behavior is marked by actions such as respectful dialogue, active participation, and the responsible sharing of information (Zhu, 2021). Conversely, unethical behaviors—such as cyber harassment, trolling, and the spread of misinformation—undermine the integrity of online spaces, damaging trust and weakening community bonds (Ma et al., 2020).

Previous studies have explored various dimensions of digital citizenship and online behavior, yet the relationship between IT ethics and netizenship behavior remains underexplored. Furthermore, factors like digital literacy, hierarchical influences, and cultural or religious values are likely to mediate how individuals

apply ethical principles in their online interactions. For example, hierarchical structures within organizations or communities often influence ethical behavior, where leadership sets ethical norms for digital conduct (Ma et al., 2020). Additionally, digital literacy plays a critical role in understanding and implementing ethical practices online, with those who possess higher digital literacy exhibiting more responsible online behavior (Gomes, 2021). Cultural and religious values, particularly in communities where ethical frameworks like Islamic work ethics are prominent, also shape individuals' ethical engagement in digital spaces (Asif et al., 2020).

Given these factors, this study aims to explore the relationship between individual IT ethics and netizenship behavior. It will also examine how mediating factors—such as digital literacy, hierarchical influence, and cultural or religious values—affect this relationship. By addressing these aspects, the research will provide insights into how IT ethics can be leveraged to promote responsible online conduct, ultimately contributing to the development of ethical digital communities.

2. Literature Review

Netizenship refers to the behavior of individuals as members of the online community, encompassing how they interact, contribute, and consume information on digital platforms. Netizenship behavior is shaped by various factors such as cultural values, online social norms, and individual attitudes toward technology. It includes aspects such as digital civic engagement, respectful communication, information sharing, and collaboration. According to recent studies, ethical netizenship is critical for sustaining positive online ecosystems, especially in mitigating cyberbullying, fake news, and other forms of digital misconduct (Zhu, 2021). Hauben (1998) captured the emergence of "citizen of the Net" citizens who carry invigorated rights and obligations, care about Usenet and the bigger Net, and work toward building a corporative and collective nature that benefits the larger world (Yigit, 2014).

Information Technology Ethics (IT Ethics) refers to the set of moral principles that guide individuals' actions when using technology. These principles include privacy, intellectual property rights, digital literacy, and the responsible use of online platforms. As users navigate the digital landscape, their ethical stance influences decisions ranging from sharing personal information to interacting with others in online spaces. Ethical behavior in IT is crucial to maintaining trust, ensuring data security, and promoting fairness in digital interactions (Floridi, 2019).

In other terms, IT ethics also called netiquette is a combination of the words network and etiquette and is defined as a set of rules for acceptable online behavior. According to (Fauzan, 2013) *akhlaq* should be highlighted as the most important element in all phases of human life. Other studies, mentioned that ethics is the study of what constitutes right and wrong behavior (Laudon, 2006). According to Salam (2010), computer and information ethics (IE) is an emerging field that continues to define new theories exploring our moral and human nature in the context of changing technologies and prevalent globalization.

According to Norshidah et al (2012), in a survey of information systems professionals (as cited in Cappel and Windsor, 1998) those with religious affiliation differ significantly in attitudes toward computer use in selected cases. The strong values and set of beliefs also lead to stronger opinions and perceptions of the observed unethical behavior. As Doucette et al. (2012) mention, we can respect a particular individual as a great thinker, as an occupant of a position of authority, as a threat, or just as a person, and to do so is to pay them a different kind of respect in each case.

Several theoretical models can be applied to understand the intersection between IT ethics and netizenship behavior. A relevant framework is the Theory of Planned Behavior (TPB), which postulates that individuals' intentions to engage in a specific behavior are influenced by their attitudes, subjective norms, and perceived behavioral control (Ajzen, 1991). When applied to the digital context, TPB suggests that ethical attitudes toward IT (e.g., respecting privacy) and the perceived social pressure to adhere to ethical online norms (e.g., discouraging hate speech) shape individuals' netizenship behaviors.

Additionally, the concept of Digital Citizenship provides a basis for understanding how individuals' ethical

orientations in the digital space align with responsible netizenship. Digital citizenship encompasses norms of appropriate, responsible behavior about technology use, such as respecting the rights of others and promoting digital inclusion (Ribble, 2017). By applying these frameworks, we can better analyze how ethical IT usage correlates with active and positive netizenship behavior.

The Relationship Between IT Ethics and Netizenship Behavior

Research has shown a growing awareness of the ethical challenges posed by digital technologies, particularly regarding issues of data privacy, cyber harassment, and misinformation. Studies suggest that individuals who adhere to strong IT ethics are more likely to engage in responsible netizenship behaviors (Dahlberg, 2020). For instance, those who prioritize privacy and data security tend to exercise more caution in sharing information online, contributing to safer digital spaces.

Moreover, Islamic work ethics and cultural values have also been examined as mediators in this relationship, particularly in regions with strong religious values (Asif et al., 2020). For example, Islamic principles of fairness, respect, and accountability are often reflected in online interactions, fostering a more ethical digital environment. Digital Literacy plays a crucial role in shaping ethical behavior. Individuals who are more digitally literate tend to understand the ethical implications of their online actions and, as a result, are more likely to demonstrate positive netizenship behaviors (Gomes, 2021). Digital literacy encompasses not only the technical skills to navigate digital platforms but also the critical thinking skills needed to evaluate information, engage in respectful dialogue, and recognize ethical dilemmas.

Factors Influencing IT Ethics and Netizenship Behavior

The influence of an individual's hierarchical level in an organization or community on IT ethics and netizenship behavior is significant. Studies show that individuals in higher positions often set ethical norms and standards for their subordinates, and this can extend to digital conduct (Ma et al., 2020). Ethical leadership in digital spaces can promote responsible netizenship by modelling appropriate behavior and setting expectations for others.

Generational differences also play a role in how individuals approach IT ethics and netizenship. Younger generations, especially Generation Z, have grown up immersed in technology and tend to have different perspectives on privacy, online interaction, and the ethical use of digital platforms compared to older generations (Turner & Reinsch, 2021). Gen Z's approach to netizenship is often more fluid, emphasizing open communication and collaborative efforts in online communities. Cultural values and religious beliefs can significantly influence an individual's ethical perspective in digital spaces. For example, ethical constructs derived from **Islamic work ethics** can lead to the adoption of specific digital behaviors aligned with respect, community welfare, and responsibility (Al-Kwifi & Hammoud, 2019).

Implications for Digital Society

The interplay between IT ethics and netizenship behavior has far-reaching implications for the digital society. Promoting ethical IT usage through digital literacy programs, ethical leadership, and policy development can foster healthier online environments. Governments, educators, and industry leaders must work together to embed ethical considerations into the design and use of digital technologies, ensuring that individuals are equipped to navigate the digital landscape responsibly. By aligning IT ethics with netizenship behavior, we can create online communities that promote inclusivity, trust, and positive engagement.

3. Research Methodology

This study will adopt a quantitative research design using a survey instrument to gather data on the relationship between individual IT ethics and netizenship behaviors. The survey will include structured questions to measure respondents' attitudes and behaviors concerning IT ethics and their engagement in online communities. This approach is suitable for capturing large-scale patterns and associations between the variables. The target population for this study will include individuals who actively engage in online platforms such as social media, discussion forums, and digital communication tools.

The sample will be drawn from university students, professionals, and digital users in Selangor, as they represent a diverse group of netizens with varying levels of digital literacy and exposure to technology. A stratified sampling technique will be used to ensure representation from different demographics such as age, education level, and occupation. A sample size of approximately 300-400 respondents will be targeted to ensure statistical validity. This size is appropriate for conducting multiple regression analyses to test the proposed relationships between IT ethics and netizenship behavior. Respondents must be over the age of 18, regularly use the Internet for communication and information-sharing purposes and have access to digital platforms.

The survey instrument will be divided into three main sections consisting of demographic information, IT ethics and netizenship behaviors. A Likert-scale questionnaire will be used to measure the ethical attitudes of respondents toward IT usage. This section will include items on privacy concerns, data security, intellectual property respect, and responsible digital behavior. Items will be adapted from established IT ethics scales (Floridi, 2019). A second set of Likert-scale questions will measure respondents' netizenship behavior, focusing on aspects like digital civic engagement, respectful communication, and participation in online communities. Items will be adapted from netizenship behavior studies (Zhu, 2021).

Data will be collected via an online survey platform to ensure ease of access and reach for respondents. The survey link will be distributed through university mailing lists, social media platforms, and professional networks to attract a diverse respondent pool. The survey will be open for responses over one month. The collected data will be analyzed using Statistical Package for the Social Sciences (SPSS). Descriptive statistics will be used to summarize the demographic profile of the respondents and their overall responses to IT ethics and netizenship behavior. To explore the relationship between the two constructs, multiple regression analysis will be conducted to determine the strength and direction of associations.

Informed consent will be obtained from all participants before they proceed with the survey, ensuring that their participation is voluntary and that their responses will be kept confidential. The study will also comply with university ethics approval processes and national regulations on data protection. This methodology ensures a comprehensive and systematic approach to investigating the relationship between IT ethics and netizenship behavior using a reliable and valid survey instrument.

4. Conclusion

This research emphasizes how critical it is to comprehend how netiquette—or the ethical behavior of online users—relates to information technology (IT) ethics. There is a growing need for ethical digital conduct as people interact with online platforms more and more. Promoting responsible online conduct requires a strong foundation in IT ethics which includes ideas like data security privacy protection and respect for intellectual property. Following these moral principles encourages good netizenship practices such as courteous communication engaged participation and responsible information sharing all of which are necessary to build secure and reliable online communities.

This research highlights the importance of digital literacy in helping people navigate moral conundrums when navigating the internet in addition to IT ethics. Digital literacy is a crucial element of ethical online engagement because individuals with higher levels of digital literacy are better able to comprehend and apply ethical principles. Hierarchical influence also plays a significant role, particularly in organizational or structured settings. A culture of ethical participation can be fostered in the digital community by leaders setting an example of ethical behavior and encouraging others to follow suit. Furthermore how people approach making moral decisions in digital spaces is influenced by cultural and religious values such as Islamic work ethics. In contexts with a diversity of cultural backgrounds in particular these values offer a moral compass that influences behavior online.

Future studies should confirm the relationships between IT ethics and netizenship behavior through empirical research emphasizing the roles that digital literacy leadership and cultural values play as mediators in these relationships. To promote moral behavior online and enhance digital citizenship IT ethics must be promoted through leadership and educational programs. This research contributes to the development of more

responsible and healthy online communities by offering insightful guidance on how to improve ethical behavior in digital settings.

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Fostering Nurses' Support in the Workplace: Addressing Job Burnout Among Malaysian Medical Doctors Working in Public Hospitals

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Abstract: Job burnout in employees is caused by individual factors, including demographic characteristics and nurses' support. This study analyzed the relationship between nurses' support and job burnout among medical doctors in Malaysian public hospitals. This research was a correlational study with a cross-sectional design. The research sample was 471 employees, using the non-probability sampling method with the purposive and quota sampling techniques. Data collection used the Abbreviated Maslach Burnout Inventory (aMBI) and nurses' support items. The data in this study were analyzed using the Statistical Package Social Science (SPSS) and Partial Least Squares Structural Equation Modelling (PLS-SEM) software. Findings suggest that 77 medical doctors who participated in the study were from Hospital Pulau Pinang, from the Emergency Department, mostly female, ranging from 24-56 years old, single, and have an MBBS education level. The study assessed the measurement model's loading, average variance extracted (AVE), and composite reliability (CR) where the loadings were above 0.60. AVEs were greater than 0.50 and CRs were greater than 0.708. Additionally, the bootstrap BCI LL (-0.079) and UL (-0.002) for nurses' support and job burnout were not straddled a 0 in between. Job burnout had a negative association with nurses' support. In particular, nurses' support towards medical doctors lowers their risk of job burnout, which has a substantial impact on medical doctors' overall well-being. The findings indicated that medical doctors who had complete support from their nurses performed their jobs more efficiently, displayed good task performance, and experienced less job burnout.

Keywords: *Nurses' support, job burnout, Malaysian public hospitals, medical doctors, embedded two-stage approach, PLS-SEM*

1. Introduction and Background

Job burnout is a significant issue affecting medical professionals at all stages of their careers. It is characterized by emotional exhaustion, depersonalization, and a decreased sense of personal accomplishment (Maslach et al 2001). Burnout can lead to detrimental effects on both the individual medical doctors and health care professionals. Burnout among Malaysian medical doctors is a pressing public health issue and the COVID-19 pandemic has brought this addressed issue into immediate awareness the pandemic has worsened it (Abdulmohdi, 2024; Chow, Francis, Ng, Naim, & Beh, 2021; Khan, Ntatamala, Baatjies, & Adams, 2024; Melnikow et al., 2024; Woon & Tiong, 2020). With 79,440 medical doctors and 78, 118 nurses in public hospitals in a variety of specialties and settings affected by the ongoing stresses of the increased workload and emotional burden, monitoring and protecting the well-being of all medical doctors working in public hospitals is of utmost importance (Guastello, 2024; Ministry of Health, 2022). Job burnout consists of emotional exhaustion, depersonalization, or reduced feelings of accomplishment. Burnout can happen in any employment setting but is especially relevant in healthcare professionals because it leads to an increase in compassion fatigue, workplace turnover (Sheng, Tian, Sun, Hou, & Liu, 2023), lower quality of care, decreased patient satisfaction and increased rates of medical errors. According to Omar and Nasurdin (2019), social support includes subordinate relationships in medical settings, such as nurses establishing special relationships to ensure the smooth of delivering services to patients.

Nurses provide important support to medical doctors such as ensuring necessary information has been provided by medical doctors correctly and completely, ensuring blood samples are taken from the corrected patient by the medical doctors, ensuring consent is taken and initialed by the medical doctors, patient or patient's relatives and witnessed by the nurses in charge, ensuring that there are written instruction from the medical doctors before serving medicine to the patient, ensuring the medical doctor in charge signed on the

result's slip and attached it to the patient's record before dispatching to the record office and treating injury patient according to the medical doctor's order. There is a dearth of research on job burnout associated with healthcare workers (HCW) especially medical doctors working in Malaysian public hospitals (Chow et al., 2021; Fauzi et al., 2020; Ismail, Lee, Tanjung, Jelani, & Latiff, 2021; Lau, Hadi, Marzuki, Ismail, & Che Ismail, 2024; Leong, 2023). Generally, literature is abundant on employee well-being such as job satisfaction (Chew, Ramli, Omar, & Ismail, 2013; Dousin, Collins, & Kler, 2019; Ramlan, Rugayah, & Zarul Zafuan, 2014; Roslan, Noor Hazilah, Nor Filzatun, & Azahadi, 2014), health behaviors (Alexandra-Karamanova et al., 2016), and absenteeism (Danna & Griffin, 1999) in the context of health care professional. Thus, there is a need to do a more in-depth study on nurses' support of medical doctors' job burnout as the amount of research done focusing on this matter is scarce, and the generalizability of this study is limited.

2. Literature Review

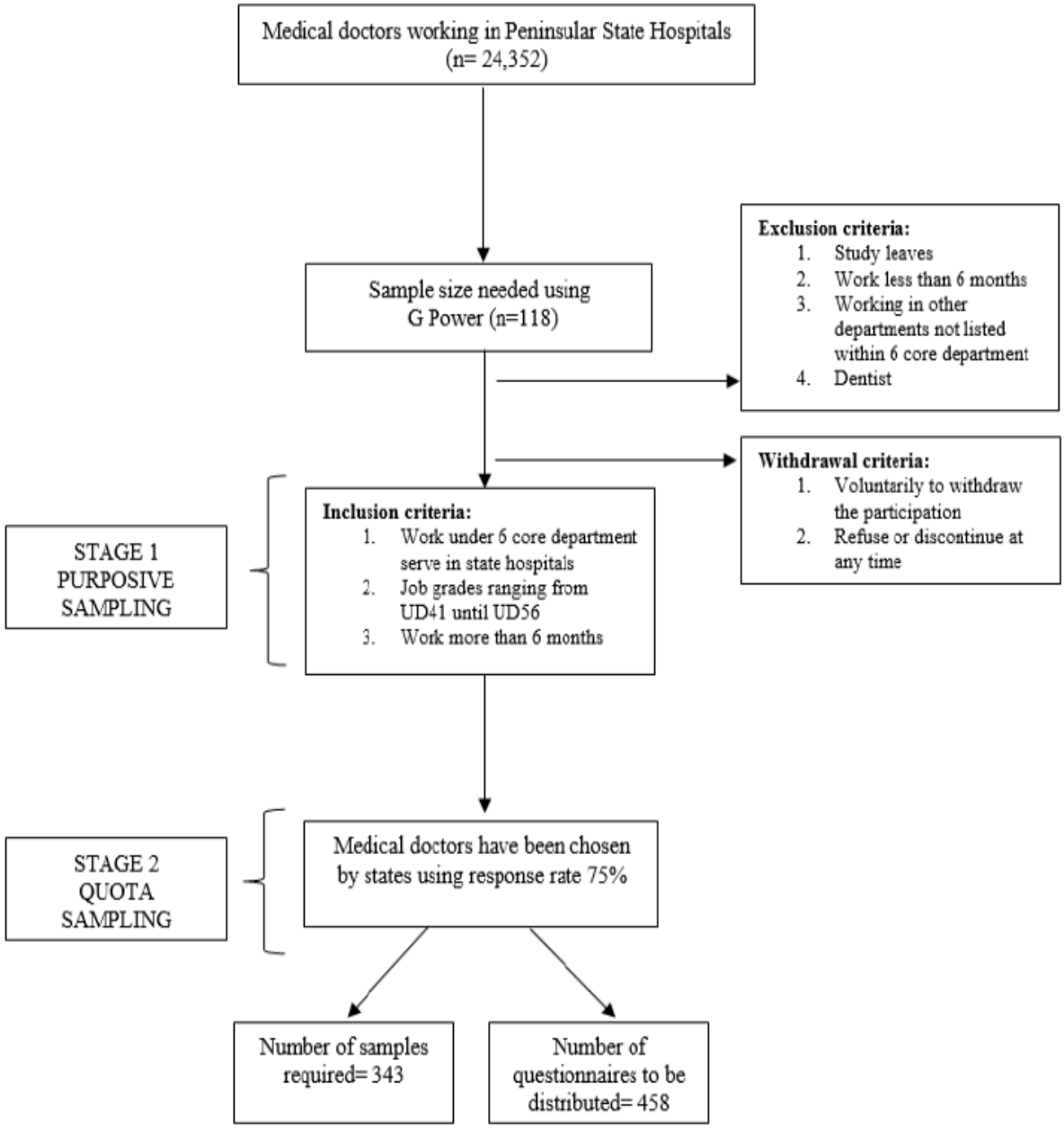
Nurses' support: Support from subordinates, such as, nurses, has a significant impact on doctors' well-being, especially in terms of reducing the risk of job burnout (Geuens, Verheyen, Vlerick, Van Bogaert, & Franck, 2020; Li, Ruan, & Yuan, 2015; Ruisoto et al., 2021). Previous research has sparked controversy about whether or not medical doctors are satisfied with their subordinate support levels (Tourangeau, Hall, Doran, & Petch, 2006; Yang, Liu, Liu, Zhang, & Duan, 2017). Tourangeau et al. (2006) Stated that nurses are subordinates to medical doctors. Thus, it was discovered that the relationship between nurses' support and job burnout influences medical doctors' well-being. The findings implied that medical doctors needed nurses' support to function effectively, especially when patients sought care in hospitals (Geuens et al., 2020; Tepper, Moss, & Duffy, 2011).

The relationship between medical doctors and nurses is significant in a hospital. They work together as a team and are likely to be satisfied with their jobs if both parties give commitments, are interdependent with each other, and are professional to avoid conflict during patient treatment. (Mills, Wand, & Fraser, 2018; Xu et al., 2019). Effective teamwork depends on a supervisor-subordinate relationship; thus, nurses' support is significant in the study (Nantsupawat et al., 2016; Rafferty, Ball, & Aiken, 2001). For instance, a study in an Australian hospital showed that collaboration between medical doctors and nurses created the best accomplishment during medication activities, patient medication safety, and effective care (Liu, Gerdtz, & Manias, 2016). The tensions between medical doctors and nurses generated a stressful working environment, leading to medical doctors' job burnout. Results found that medical doctors who received full support from their nurses were more effective in doing work, displaying effective task performance, and lowering job burnout. The findings also supported that when the employees experienced job burnout and depleting work performance, they lessened the mark when they received nurses' support. As a result, nurses are a key factor influencing job burnout among medical doctors. Therefore, the following hypothesis is proposed:
H1: There is a negative relationship between nurses' support and job burnout

3. Research Methodology

In Figure 1, the purposive sampling method was adopted in the first stage includes by selecting subjects who are in the best place to provide information. For instance, only six core departments had been selected in 12 state hospitals, as these were common in all state hospitals. Besides that, only registered medical doctors who have worked for more than six months were eligible to be part of the sample with job grades, such as UD41, UD43/44. UD47/48, UD51/52, UD53/54, and UD55/56. In the second stage, quota sampling was used to pre-specify the control characteristics and assess their distribution within the target population. Since these control characteristics were chosen based on judgment, a portion of the selection process was left at the researcher's discretion. The number of samples needed for each state is quoted based on the response rate of 75%. Therefore, there would be no waste of resources. With a minimum sample size requirement of 343 medical doctors, the total number of questionnaires to be distributed was 458. The number of questionnaires to be distributed to each state would be calculated based on the percentage quoted for each state hospital.

Figure 1: The Sampling Techniques Flow Chart



Nurses' support was measured using four items adapted from Hayton, Carnabuci, and Eisenberger's (2012) scale. Consistent with Shanock and Eisenberger's (2006) study, this study measured nurses' support with the same items used to assess nurses' support, as modified by replacing the words *subordinate* with the words *nurse.* A seven-point Likert scale was used from 1= strongly disagree to 7= strongly agree. The reliability of Cronbach's Alpha for nurses' support was reported at 0.84. The item such as "My nurse strongly considers my goals and values", "My nurse takes pride in my accomplishments at work", "My nurse cares about my well-being", and "My nurse values my contribution to their well-being". Job burnout was measured using nine items adapted from an abbreviated version of the Maslach Burnout Inventory (aMBI) by McManus, Winder, and Gordon (2002) following the original Maslach Burnout Inventory Human Service Survey using 22 items developed by (Maslach, Schaufeli, & Leiter, 2001). A seven-point Likert scale was used, from 1 = never to 7 = every day. The reliability of Cronbach's alpha for job burnout was reported at 0.87. An item such as "I feel

fatigued when I wake up in the morning and have to face another day on the job", "I feel emotionally drained from my work", and "Working with people all day is a strain for me", "I have become more callous towards people since I took this job", "I do not know how to deal very effectively with the problems of my patients", "I do not feel exhilarated after working closely with my patients", "I feel like I am not positively influencing other people's lives through my work", "I feel I treat some patients as if they were impersonal objects", and "I do not care what happens to some patients". "I feel emotionally drained from my work", "Working with people all day is a strain for me", "I have become more callous towards people since I took this job", "I do not know how to deal very effectively with the problems of my patients", "I do not feel exhilarated after working closely with my patients", "I feel like I am not positively influencing other people's lives through my work", "I feel I treat some patients as if they were impersonal objects", and "I do not care what happens to some patients". Cronbach's alpha for job burnout was reported at 0.87.

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4. Results

Initially, the study obtained approvals from JEPeM, Universiti Sains Malaysia (USM) (JEPeM Code: USM/JEPeM/19050334) and National Medical Research Register (NMRR) ((NMRR-19-1500-48412(IIR)). The study's final sample came from eight out of twelve state hospitals within Peninsular Malaysia while four withdrew participation due to their busy schedules and did not respond to the invitation. In total, 488 participants responded out of all the participating hospitals as shown in Figure 2. The responses yielded a response rate of 48.95 percent out of the 997 sets of questionnaires distributed. However, only 471 questionnaires were found usable for analysis.

Figure 2: List of Participating Hospitals

No.	State Hospital	Questionnaire Distributed	Questionnaire Received
1	Hospital Kuala Lumpur	130	49
2	Hospital Melaka	70	64
3	Hospital Tuanku Jaafar, Negeri Sembilan	150	64
4	Hospital Sultanah Bahiyah, Kedah	141	74
5	Hospital Pulau Pinang	131	77
6	Hospital Tuanku Fauziah, Perlis	70	51
7	Hospital Tengku Ampuan Afzan, Pahang	120	39
8	Hospital Raja Perempuan Zainab II, Kelantan	185	70
	Total	997	488

Profile of Demographic profile: Table 1 displays a summary of the characteristics of the participants involved in the study. It could be reported that the participants were mostly females, amounting to 297 female medical doctors representing 63.9 percent. The remaining, 174 medical doctors were males, representing 36.9 percent. The majority of the participants were Malays (58.6%). Apart from that, 27.2 percent were Chinese, 13 percent

were Indians, and 1.3 percent were others. The medical doctors were also asked about their education level. Most of them were MBBS or equivalent 87.3 percent, while 10.4 percent have a Master's or equivalent, 1.3 percent have a Ph.D. or equivalent, and the remaining 1.1 percent are others. Regarding their marital status, most medical doctors were single, representing 58 percent, while 41.2 percent were married, and the remaining 0.8 percent were others. In terms of job grade, 265 medical doctors were UD41 representing 56.3 percent, followed by 79 medical doctors were UD47/UD48 representing 16.8 percent, followed by 67 medical doctors were UD43/44 representing 14.2 percent, and 12.8 percent from UD51/UD52, UD53/54 and UD55/UD56 amounting 60 medical doctors as total. Table 1 reported that the participants were mainly from the Emergency Department, amounting to 154 medical doctors, representing 32.7 percent of the total participants. Besides that, the participants are from eight state hospitals who agreed to participate in the study. Most participants are from Hospital Pulau Pinang, representing 76 participants.

Table 1: Demographic Profile

VARIABLE	FREQUENCY	PERCENTAGE
GENDER		
Males	174	36.9%
Females	297	63.1%
Total	**471**	**100%**
RACE		
Malay	276	58.6%
Chinese	128	27.2%
Indian	61	13%
Others	6	1.3%
Total	**471**	**100%**
EDUCATIONAL LEVEL		
MBBS or equivalent	411	87.3%
Master or equivalent	49	10.4%
PhD or equivalent	6	1.3%
Others	5	1.1%
Total	**471**	**100%**
MARITAL STATUS		
Single	273	58%
Married	194	41.2%
Others	4	0.8%
Total	**471**	**100%**
JOB GRADE		
UD41	265	56.3%
UD43/44	67	14.2%
UD47/48	79	16.8%
UD51/52	23	4.8%
UD53/54	21	4.5%
UD55/56	16	3.4%
Total	**471**	**100%**
Department		
General Medicine	85	18%
Orthopedic	19	4%
O&G	31	6.6%
General Surgery	40	8.5%
Pediatric	142	30.1%
Emergency Medicine	154	32.7%
Total	**471**	**100%**

Descriptive Statistics: In Table 2, the average participants' age was 30.9 years old, with a minimum age of 24 and a maximum age of 56. For tenure of their position, the majority of the participants had an average of 3.4 years, with a minimum of three months and a maximum of 30 years. In addition, for servicing the current

hospital they were attached to, the average was 2.6 years, with a minimum of a month and a maximum of 30 years. For total service as a registered medical doctor, the average was 4.5 years, with a minimum of 6 months and a maximum of 35 years.

Table 2: Participants' Age, Position Tenure, Service at Current Hospital, and Total Service as a Registered Medical Doctor

Variable	Mean	SD	Min	Max
Age (years)	30.9	5.1	24	56
Position Tenure (years)	3.4	3.9	0.25	30
Service at Current Hospital (years)	2.6	3.2	0.09	30
Total Service as a Registered Medical Doctor (years)	4.5	4.9	0.5	35

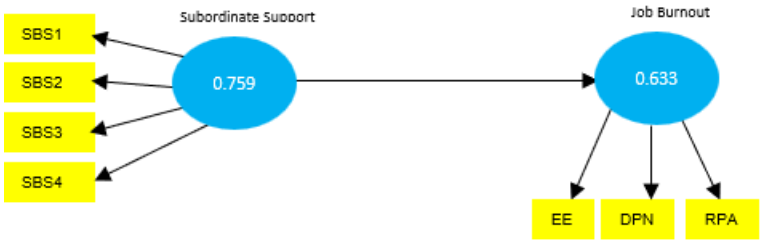
In Table 3, the study assessed the measurement models' loadings, average variance extracted (AVE), and composite reliability (CR). The values for composite reliability (CR) are considered satisfactory and very good whereby the values for nurses' support is 0.926, and job burnout is 0.838. According to Henseler, Hubona, and Ray (2016), to measure the internal consistency, the loading of each item must be examined. Loading values in each item are considered acceptable if the loading values are equal to and greater than 0.7. Thus, loading values for nurses' support and job burnout were greater than 0.70. Besides, if the AVE scores are greater than 0.5, the loading items are still acceptable if the values are equal and greater than 0.6 (Byrne, 2016). As shown in Table 3, AVEs were greater than 0.6, and CRs were greater than 0.7. The loadings were also acceptable, with less than five loadings less than 0.708 (Hair, Risher, Sarstedt, & Ringle, 2019).

Table 3: Measurement Model for the Second-Order Constructs Outer Loadings Values, Composite Reliability (CR), and Average Variance Extracted (AVE)

Constructs	Items	Loadings	AVE	CR
Nurses Support	SBS1	0.850	0.759	0.926
	SBS2	0.879		
	SBS3	0.903		
	SBS4	0.852		
Job Burnout	EE	0.853	0.633	0.838
	DPN	0.722		
	RPA	0.807		

Figure 3 shows shown job burnout was conceptualized as a higher-order construct, a hierarchical component comprising three first-order reflective constructs (emotional exhaustion, depersonalization, and reduced personal accomplishments). The second-order constructs were measured following the repeated indicators approach for the first-order constructs and moved to the second-stage approach called as embedded two-stage approach (using the latent variable score) as proposed by Becker, Klein, and Wetzels (2012), Ringle, Sarstedt, and Straub (2012), and Sarstedt, Hair, Cheah, Becky, and Ringle (2019). The embedded two-stage approach was used by creating a new dataset based on the standardized scores of all constructs in the repeated indicators approach and adding a new variable, job burnout, to the model.

Figure 3 Second-Order Construct using the Embedded Two-stage Approach



In Table 4, the structural model is examined. The assessment of the structural model involved assessing the path coefficient to assess the significance and relevance of the structural model relationship by using a 5,000-sample re-sample bootstrapping procedure (Beta, standard errors, *t*-value, *p*-value) as suggested by Ramayah, Jacky, Chuah, Ting, and Memon (2018) and Wong (2013). The path coefficient values for nurses' support and job burnout were -.0.040 with a *t*-value of 1.336. Additionally, the result showed that all the direct effects of 99 percent and 90 percent bootstrap BCI LL and UL were not straddling a 0 in between, indicating that there was a significant result. Thus, the findings ascertained that there was a negative relationship between nurses' support and job burnout. Therefore, H1 was supported.

Table 4: Hypothesis Testing for Direct Path

Hypothesis	Std Beta	Std Error	*t-values*	*p-values*	BCL LL	BCI UL
H1: Nurses' support ->Job Burnout	-0.040	0.030	1.336	0.091*	-0.079	-0.002

*p<0.10

Discussion

The direct effect between nurses' support and job burnout was examined. This study examined the relationship between nurses' support and job burnout. The results of this study support the assertion that there was a significant relationship with job burnout. Thus, H1 is accepted. The results from this study support previous literature considering nurses' support reduced job burnout among medical doctors (Geuens et al., 2020; Ruisoto et al., 2021). The findings by Geuens et al. (2020), Shacklock, Brunetto, and Farr-Wharton (2012), and Tepper et al. (2011) implied that medical doctors needed nurses' support to function effectively, especially when the medical doctors needed nurses to assist them in treating and managing patients. As a result, nurses should be provided with support in terms of knowledge, and service on patient needs, particularly those involving complicated situations. Rapidly growing in the body of knowledge of social support, nurses' support became one factor contributing to medical doctors' well-being, including job burnout (Abdulmohdi, 2024; Xu et al., 2019). Medical doctors experiencing heavy workloads need nurses' support to buffer the pressure in high-stress environments. For example, medical doctors and nurses need to have a clear relationship to reduce miscommunication to avoid failure to achieve expectations, especially when treating patients (Carter, Mohammed, Upshur, & Kontos, 2023; Slater & Herbert, 2023). They must also mix with the nurses since they work as a team (Xu et al., 2019). Both parties will fully commit and be interdependent to avoid conflict when performing their jobs. For instance, medical doctors who work in the Pediatrics, O&G, and Emergency Medicine departments are considered to experience a high prevalence of job burnout compared to other departments; therefore, they need full support from the nurses (Xu et al., 2019). Based on a qualitative study of medical doctors and nurses by Mills et al. (2018, p.10), the most highlighted point in this relationship between medical doctors and nurses' support was that *"it is the responsibility of every member in the department to look after each other, and it is called a dual-interaction process."* Liu et al. (2016) remarked that regular contact between medical doctors and nurses is important for job effectiveness, especially in drug administration tasks, such as medication prescribing, dispensing, delivering, taking, recording, assessment, and counseling.

5. Managerial Implications and Recommendations

This study provides several practical implications to the Ministry of Health Malaysia (MOH), Malaysian Medical Council (MMC), and other public administrations on the work-related factors influencing job burnout of medical doctors. A report of "Malaysia Patient Safety Goals: Nurses Roles and Responsibilities" by the Nursing

Division, Malaysia Ministry of Health (2015) Suggested that regardless of the nurse's grades and position, every nurse plays a critical role in supporting medical doctors in treating patients. The guideline helps to educate the nurse's roles and responsibilities by delivering the work based on the Nursing Action Plan according to the 13 Malaysian Patient Safety Goals. The Malaysia Ministry of Health doubled the effort by implementing the "Malaysian Patient Safety Goals 2.0" to provide a clearer guideline towards an initiative to enhance good support from nurses to medical doctors. (Medical Development Division, 2021). Despite their complexity, nurses are essential to the effective execution and attainment of patient safety goals. As such, they must be skilled in all nursing procedures and maintain an up-to-date understanding of patient safety. This is one method by which nurses can fully support the demanding work of medical doctors. Also, it is noteworthy to consider that medical doctors need to be more balanced in their lifestyle. Several programs have been offered such as training programs specifically to improve good communication between medical doctors and nurses together to demonstrate social bonding among them at the workplace. (Hussein, Ahmad, & Noh, 2018; Kunjukunju & Ahmad, 2019). Lastly, junior doctors should also be provided with flexible working hours, on-the-job training, and restructuring of the work system to reduce the risk of job burnout. (Kinman & Teoh, 2018; Thillainathan, 2011). Furthermore, medical doctors, who have been diagnosed with high risk of job burnout symptoms should be encouraged by hospital management to seek help from third parties, such as psychiatrists, families, relatives, and friends, to promote the feeling of a sense of belonging that will help to alleviate their well-being. (Fortuna, Brooks, Umucu, Walker, & Chow, 2019; van de Wal, Bucx, Hendriks, Scheffer, & Prins, 2016).

Conclusion

In conclusion, the findings have demonstrated how important it is for nurses to provide support to doctors in the workplace, particularly when it comes to reducing the likelihood of job burnout. This study expands prior research on job burnout which will add to the current body of knowledge in the nursing and medical context as well as the healthcare industry. However, this study has some limitations. First, the study was only conducted in eight public hospitals. It would be useful to replicate this study among medical doctors across other public hospitals in Peninsular Malaysia to compare findings and generalizability. Second, the study used a self-reported questionnaire that medical doctors filled in to assess job burnout. In the future, researchers may consider adding nurses' evaluations to enhance the objectivity in the perspective of nurses' support towards medical doctors' job burnout. Lastly, job burnout is still relatively uncommon as a uni-dimensional phenomenon. (Brenninkmeijer & VanYperen, 2003; Cheung, Tang, & Tang, 2011; Fairlie, 2011). The multidimensional approach is frequently used for job burnout in several cross-sectional studies. However, according to Innstrand, Espnes, and Mykletun (2002), job burnout could be considered a single psychological state that measures one construct rather than in separate dimensions. Besides that, this approach ensures parsimony to the study's framework by focusing on the job burnout construct as a whole rather than looking at separate dimensions of job burnout. (Betoret, 2009; Brenninkmeijer & VanYperen, 2003; Tan, Lew, & Sim, 2019). Thus, future research suggests the multi-dimensional approach will be considered mainly focused on emotional exhaustion which the dimension strongly dominated compared to the other two dimensions. It is suggested uni-dimensional approach versus a multi-dimensional approach may be determined by the researcher's objectives and the complexity of the research design.

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From Local Markets to Global Success: A Case Study on Scaling and Innovating in the Food Manufacturing Company

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Abstract: This paper aims to analyze the development process of a famous food manufacturing company that started only in local farmer markets aiming at snacks and agricultural products. Looking back at the different fiscal years, the company has acquired numerous accomplishments, hence attributing it to a strong focus on quality and innovation. There are several serious issues that a company faces while the strategies revealed above are to establish and consolidate a position in the rapidly growing food manufacturing industry. Some of these are the challenges of globalization, diversification of product portfolio, sustaining innovation, and building a strong and easily identifiable brand. In this paper analyzing the specifics of the company's development, its strategic directions, and defining the major issues and problem-solving approaches in responding to these complex challenges a certain group of questions will be highlighted. The paper discusses the factors that have facilitated the effectiveness of its strategic management concerning the achievement of the firm's goals and sustained growth amidst challenges. From the examination of the company's strategic choices, operating changes, and patterns of analyzing the market environment, this study has gone a long way in establishing the key dynamics underlying operation scaling within the food manufacturing industry. The lessons from this case suggest that to sustain a commitment and build a highly competitive mass-market business over time there is a need for flexibility, creativity, and vision.

Keywords: *Local Farmers' Markets, Strategic Planning, Market Adaptation, Scalability.*

1. Introduction and Background

Local markets serve as vibrant venues where regional producers can directly engage with consumers, offering a diverse range of products including fresh produce, meats, dairy items, and handcrafted goods. Typically held on a weekly or monthly basis, these markets are commonly situated in public spaces such as parks or town squares. They provide an opportunity for consumers to connect with local producers and gain insights into the origins and production methods of their food and other products. By facilitating the direct sale of goods from producers to consumers, local markets effectively bypass traditional intermediaries like wholesalers and retailers. This direct-to-consumer approach fosters a closer relationship between producers and buyers, enhancing community engagement and supporting local economies (Hinrichs, 2003; Low and Vogel, 2011; Waris & Arun, 2022). There are three main types of e-marketplaces: Business-to-Consumer (B2C), Business-to-Business (B2B), and Consumer-to-Consumer (C2C). These platforms function as neutral intermediaries, enabling interactions between the two parties involved (Cano et al., 2023).

Recent years have seen a growing focus on the development of local food markets as part of initiatives to foster sustainable and resilient food systems. Various factors influence their growth and sustainability, with consumer demand being particularly crucial. The rising interest in locally sourced and sustainable food has created a niche for local producers, leading to the establishment of direct-to-consumer channels.

Local markets act as vibrant hubs for families and entrepreneurs, offering a venue to enjoy local foods and crafts. These markets have a substantial economic impact, influencing employment, income generation, entrepreneurship, and community development. The advantages of shopping at local markets go beyond the fresh products and outdoor atmosphere. Active local markets significantly boost income for individuals and businesses, fostering economic growth. Throsby's (2001) research highlights that local markets and cultural industries positively affect income and economic development in rural areas. Supporting businesses at farmers' markets helps keep money within the community. Increased local purchasing encourages businesses to expand production, enhancing the local economy. Additionally, locally sourced foods often involve lower production

costs for farmers, eliminating extra delivery fees and preservatives. This enables farmers to offer fair prices, benefiting both consumers and producers.

Supporting local businesses at outdoor markets indirectly contributes to job creation. As vendors sell their goods, they often need to restock, which can require additional staff. Increased revenue from local shoppers enables small businesses to create more jobs. In addition to economic benefits, shopping at local markets has positive environmental impacts. Local foods from these markets come directly from producers, reducing transportation needs and conserving resources, which results in fewer emissions. Local markets also support the growth of micro and small enterprises by fostering direct connections between producers and consumers (Surya, et. al, 2021). They play a vital role in community development by encouraging social interactions and building social capital (Ghahtarani, Sheikhmohammady, & Rostami, 2019). Moreover, these markets preserve regional cultural identity by showcasing traditional crafts, local produce, and cultural products. This preservation can attract tourists and promote cultural tourism, as noted by Getz and Carlsen (2000) in their study on cultural tourism and sustainable local development.

The purpose of this case study is to provide a comprehensive analysis of the food manufacturing company, covering its company profile, SWOT analysis, and key challenges. This study will explore the strategies implemented to overcome these obstacles and enhance the company's prospects. By examining the factors contributing to the company's success, this paper aims to extract valuable insights from its entrepreneurial journey. The objective of this study is to analyze the economic, social, and environmental impacts of local markets on community development, with a focus on how these markets contribute to sustainable food systems, support local economies, and foster community engagement. Thus, these analyses could offer guidance and applicable strategies for other SME businesses, particularly in the food manufacturing sector.

2. Methods

A case study approach has been chosen because the phenomenon being examined is novel, with few similar studies available, and the goal is to deepen researchers' understanding of it (Eisenhardt, 1989). Additionally, given that the objective is to explore strategic planning for scaling operations within the food manufacturing industry, a case study is a suitable methodology. Case studies can focus on either a single case or multiple cases (Yin, 1994). In this study, a single case has been selected: a local food manufacturing company that represents a successful small business in the food sector. This choice is also influenced by the limited number of small companies expanding globally and scaling their operations.

Yin (1994) identifies three types of case studies: descriptive, exploratory, and explanatory. This case study provides a detailed account of the strategies implemented and the outcomes achieved by the company, which has successfully made operational adjustments and adapted to the market. The analysis follows the process outlined by Eisenhardt (1989), which includes defining the analysis content, selecting relevant cases, analyzing collected data, and discussing implications. Specifically, the analysis focuses on understanding the company's strategic decisions in a competitive and evolving market. Information collected includes the company's goals, the obstacles encountered, and the results achieved. The chosen company is notable for its rare achievement as a small business expanding globally within the food sector, highlighting its success in innovation through scaling operations and market adaptation using social media and the web.

Various data collection methods can be used in case studies, including qualitative, quantitative, or combination. Given the novelty of the phenomenon and the study's goal of explaining the success of local markets, a qualitative approach has been used. Yin (1994) suggests employing multiple sources of evidence, known as data triangulation. For this case study, data was gathered through interviews with marketing and R&D staff, non-participant observation of the website, documentation, and archival resources.

3. Case Study: The Food Manufacturing Company

The company can be regarded as a family enterprise that is tightly connected to the major strengths which are great internal support and the united vision. The family nature of the company means that there is cooperation, people are motivated, and good decisions are made for the company to continue running well. This internal

consistency is necessary because it enables one to overcome existing challenges while at the same time exploiting existing opportunities. Everyone in the family agrees with the company's principles and goals as they all share a commitment to achieving its growth. Due to its cohesiveness, the company becomes more sturdy and agile, enabling it to adjust to changes in the market dynamics while ensuring long-term success. Aside from that, the company's employees benefit from a supporting network that includes long-term employee retention and a work-life balance that contributes to greater productivity and organizational motivation.

Moreover, the majority of the employees at the company have been working for over 50 years, resulting in the company having an experienced workforce. On the other hand, there is a very sound knowledge base and high levels of skill despite these years of service, thus warranting efficient, productive, and most of all, quality production. For instance, the policies the company has about break times include lunch and relaxation breaks from 12p.m-2p.m hence improves balance and lifts employees' spirits/ contentment. This way, there will be a little turnover of employees and the critical information is retained within an organization through the creation of dedicated and spirited employees.

Building a better online presence could help the business attract more customers from beyond the local area and reach as many potential customers as it could. Hence the business should have developed an effective online strategy, including an e-commerce platform for selling products, boosting sales, and creating brand awareness. By diversifying its customer base, the business is more stable. The company can enhance its product offerings and marketing strategies to maintain its market position.

The local market for traditional snacks may become saturated, thus restricting growth opportunities for the company within Malaysia. With an increasing number of players entering the market, differentiating products and maintaining a competitive edge can be challenging. Consequently, the company must focus on unique selling propositions and innovative product development to stand out in a crowded market. Furthermore, economic fluctuations and downturns can adversely affect consumer spending, particularly on non-essential goods like traditional snacks. Such economic challenges can lead to reduced sales and profitability for the company. Therefore, the company needs to implement strategic measures to mitigate the impact of economic downturns, such as diversifying its product range and exploring new markets. Moreover, changes in food safety regulations, halal certification requirements, and other governmental policies can pose a threat to the business. Adapting to new regulations can increase operational costs and require additional resources. Hence, the company must stay abreast of regulatory changes and ensure compliance to avoid potential legal and financial repercussions.

While expanding its market reach internationally, competing in global markets presents significant challenges. Different consumer preferences, local competitors, and varying regulatory requirements in foreign markets can pose hurdles. Therefore, the company needs to conduct thorough market research and tailor its products and marketing strategies to fit the specific needs of each international market. Additionally, the rapid pace of technological advancements in food production and marketing can be a threat if the company is unable to keep up. Falling behind in automation, online marketing, or e-commerce capabilities can disadvantage the company. Consequently, the company must invest in technology and innovation to enhance production efficiency and engage effectively with modern consumers. Lastly, any negative publicity related to product quality, safety, or business practices can severely damage the company's brand reputation. Maintaining high standards and effective crisis management are crucial to mitigating this threat. Therefore, the company must prioritize quality control and transparent communication to preserve its brand integrity and consumer trust.

4. Results & Discussion

As the company tries to grow and do well in the competitive food manufacturing industry, it faces several big problems that need to be dealt with in a planned way to ensure long-term success. These problems include going global, making more products, coming up with new ideas, building a brand, marketing, and keeping quality high standards to ensure customers are happy.

i) International Growth

International growth is defined as pursuing business opportunities beyond the domestic borders of a nation,

and it has established itself as an aspiration for companies worldwide (Anand, et. al., 2021). The very reason for expansion is simple: new opportunities, new markets, and the potential for companies to flourish (Buckley, 2020). The difficulty of going global is one of the biggest problems that the company has to deal with. When businesses expand to a new market, they have to deal with a lot of different regulations, each with its own rules and standards that businesses have to follow. This can be hard to do because when businesses do not follow these rules, they can position the company in trouble with the law due to delays in entering new markets, as well as damage the company's reputation. Furthermore, when examined closely, an entrepreneurial endeavor's origin seems irrelevant to the scale of growth and impacts made (Ng, & Ahmed, 2024). Regardless of their origins, small and big, national-based or internationally formed, the success of businesses often heavily depends on how timely innovations in services, products, or processes are introduced to the corresponding market. Additionally, the complicated rules for importing and exporting will create different levels of difficulty, necessitating a thorough knowledge of trade deals, tariffs, and customs regulations. Certain ASEAN countries like Singapore are also so strict in importing food and agricultural products since they are aware of the biohazard impact on their agricultural production.

ii) Product Diversification and Innovation

To maintain the growth of a business, different competitors often adopt different and impactful strategies: product innovation, market penetration, market development, and product diversification (Sohl, Vroom, & McCann, 2020), There are two strategies, in addition to the product innovation strategy, that are increasingly adopted and have been the subject of extensive research: product diversification and the product diversification strategy. The product diversification strategy is the practice of broadening the range of products offered to either current customers or new potential ones. Based on Kusumawardhany & Lukito, (2024), this strategy aims to capitalize on current market strengths to gain higher sales, market shares, and market power while making the barriers to entry higher for competitors. Product innovation can be defined as a product whose design, production processes, markdowns, or performance requirements were consciously changed (Geiger & Kjellberg, 2021). The motivation for product innovation can be considered as either demand-side motivation or supply-side motivation. In the food industry, which is always changing, keeping ahead means coming up with new products and styles all the time. But this also brings its problems. Putting money and time into research and development (R&D) is necessary, but it takes a lot of both. The need to keep coming up with new ideas can put a strain on budgets and cause risks if the new goods don't do well in the market. Products such as snacks, Bahulu that are mainly produced by the company are widely known in our market, which makes it easy to copy by other competitors. Hence, the idea of diversifying the options by improving the innovation of their products is brilliant. However, whenever they expand globally further R&D effort needs to be added due to changes in consumer taste from time to time.

iii) Brand Building and Marketing

According to Steenkamp (2020), brand building has become an integral part of marketing strategies. In a globalized world filled with options for numerous products and services, companies are striving hard to create a niche. It simply refers to creating an identity in the consumer's eye and the market. He claimed that the aim of building a good brand is to foster recognition and loyalty from consumers for a particular company or product. Brand building occupies a central position in marketing strategies as it helps in making the product or company stand out among competitors (Kostelijk, & Alsem, 2020). Apart from that, building a strong reputation and making the company more visible are very important to the company. However, achieving these goals will create risks. In building good marketing efforts, they need to know a lot about how people in the area behave and how to respect their culture. A marketing strategy that works for everyone can fail, so it's important to come up with localized plans that connect with specific groups of people. As is known, the company's efforts to build its brand reputation are not easy after more than 30 years of developing its business. To cultivate trust among consumers, entrepreneurs, and partners it takes a considerable amount of time. This is because a business entity must show efforts to convince other entities about each service or negotiation that is carried out.

iv) Quality Assurance and Customer Satisfaction

Meeting customer demands via meeting quality standards is crucial to enhance purchase decisions, loyalty, and recommendations to potential customers. Quality Assurance (QA) comprises systematic inspection processes including verification to ensure a certain level of quality (Ji., et. al. 2020). The company always has to work hard

to keep quality standards high and make sure customers are happy. When making food, strict quality control methods are needed all along the supply chain, from getting the raw materials to distributing the finished product. Making sure that these standards are always met can take a lot of work and needs a strong quality assurance system. Training employees is a key part of upholding these standards, but it requires ongoing investments in their growth and the use of effective problem-solving tools. Also, how well a company can respond to changing market needs affects how happy its customers are. Continuous feedback loops from customers give them useful information, but they need to be flexible and quick to act to use this information to improve products and run their business.

Discussion

SWOT Analysis

STRENGTHS ● Robust founding team ● Product Quality ● Social Responsibility Programs	**WEAKNESSES** ● Early Financial Challenges ● Operational Challenges
OPPORTUNITIES ● Innovations of products ● Seasonal and Bulks buying ● Authentic Taste experience for tourist	**THREATS** ● Changing Consumer Preferences ● Competitive Competitor

The company's strength is its diverse range of traditional snack products that appeal to a wide range of tastes and preferences. These products consist of a variety of *"bahulu", "kuah pecal", "kuah rojak"*, a variety of crispy peanut snacks, and other products which give customers a diverse choice. This diverse product line not only appeals to a wide range of customers but also demonstrates the company's dedication to maintaining and encouraging traditional Malaysian flavors and culinary heritage. Furthermore, Halal certification from the Selangor Islamic Religious Council and JAKIM (Department of Islamic Development Malaysia) is a significant asset for the company. This certification guarantees that the company's products follow strict Islamic dietary laws, making them suitable for consumption by Muslim customers. This certification not only shows the business's dedication to quality and compliance, but it also opens up new market opportunities, both domestically and internationally.

The company's dedication to improving the community is admirable. It is because the company's employment of 30 permanent and temporary employees, as well as assisting single mothers and residents via a traditional snack product sales center, indicate an intense awareness of social responsibility and community engagement. The company assists single mothers in achieving financial independence and stability by creating job opportunities for them. The company also enhances their quality of life by providing them with a source of income, as well as the overall well-being of their families.

Regardless of its strengths, the company has several weaknesses that threaten its development and sustainability. One of the main flaws is its initial financial difficulties. With a starting capital of only RM10,000 and challenges obtaining loans and financing, the company's ability to scale operations and invest in critical resources has been limited. With such a tiny funding base, the founders had to be extremely frugal and resourceful in their financial management, making every ringgit count. Due to a lack of capital, the company is unable to invest in critical business elements such as advanced machinery, marketing, and skilled labor, all of which are required for growing operations and effectively competing in the market. Due to these challenges, the founders had to depend on their limited savings and reinvest any profits they made back into the company, slowing the rate of growth and progress.

One of the most pressing issues was handling unpaid consumer debts. In the early stages, the company most likely extended credit to attract and retain customers, but this caused cash flow issues when customers delayed or defaulted on their payments. This situation set off a vicious cycle in which the company struggled to maintain enough liquidity to purchase raw materials and continue operations. The increasing price of raw materials gave a further level of challenges. Changing costs made it difficult to forecast expenses and maintain consistent pricing for their products. This unpredictability might disrupt manufacturing processes and lower product

quality, affecting customer satisfaction and the image of the brand. To conclude, this company's early financial struggles and operational challenges evaluated the founders' resolve and resourcefulness. The company's ability to conquer these challenges through strategic planning and unwavering dedication have been critical in its transition from a small-scale operation to an established brand in the industry.

The company has the opportunity to innovate its products, exemplified by its approach to traditional Malay pastry. They have made it more relevant and increased demand by introducing various flavors such as Pandan, Chocolate Rice, and original flavor. Significant opportunities are presented through seasonal promotions and bulk buying options. By offering special promotions during festive seasons and to customers looking to purchase in larger quantities, this company can attract more customers and increase sales volume throughout the year. Furthermore, the company's customer base includes delegations and foreign tourists from countries such as Iran, the Netherlands, Indonesia, France, the United States, and others. Tourists looking for authentic traditional Malaysia 'Kueh' or pastries offered by the company. In addition, tourists could experience and see the production and process of making pastry and other products.

The first threat for the company is changing consumers' preferences based on cultural backgrounds or dietary restrictions. Traditional snacks like cake and crackers, which are sometimes thought to be rich in sugar or low in nutrients, may see a drop in demand as consumer awareness of and preference for healthy food options grows. Snacks that are organic, devoid of gluten, low in sugar, or manufactured with natural ingredients may be preferred by customers. These days, there are a lot of other companies, particularly in e-commerce, providing traditional pastries and snacks. The rivalry remains fierce. Prices and profit margins for the company may decline as a result. Businesses frequently participate in price wars in a competitive market to capture customers. Decreased profit margins for snacks and pastries will result from this, particularly if they are competing solely on price rather than on quality or unique pastry flavors selling propositions. Since the emergence of e-commerce, food manufacturing businesses have faced competition from easily accessible via the Internet in addition to local competitors.

Related Challenges

The case study analysis concludes that in overcoming growth-associated challenges for future continuation and profitability of the prospects, strategic methodologies can be used by the company customized according to every dimension linked with its expansion and operational improvement. Firstly, solving the challenges of global expansion requires meticulous planning to prepare for more stringent enforcement in the coming years. It may begin by creating and establishing teams that specialize or have an in-depth knowledge of various local-global standards as well as complying with requirements and protocols to navigate the import framework easily in other regions. Equally important is cultural adaption; in-depth market research helps understand consumer behavior, taste, and culture which can be used to offer products that are localized as well as develop campaigns that resonate with the consumers authentically thereby driving acceptance.

Secondly, if product diversification and innovation are to be an avenue through which the company might overcome these challenges, it will require a significant commitment in terms of R&D and market testing. Resources are appropriate for R&D. While constant innovation in products requires resources that are put to purpose through a rigorous process of testing the market, which is vital, as it provides feedback on what needs something further.

Thirdly, enhancing brand-building and marketing efforts demands a nuanced approach to localization and reputation management (Felzensztein et al., 2019). Crafting localized marketing campaigns that align with cultural sensitivities and consumer behaviors enhances brand visibility and resonance. Building and maintaining brand trust through consistent delivery of quality products and responsive customer service establishes enduring customer loyalty. Proactively monitoring the online presence and promptly addressing customer feedback and issues further bolsters brand reputation and consumer confidence.

Lastly, ensuring high standards of quality and customer satisfaction entails implementing rigorous quality control measures throughout the supply chain. From sourcing raw materials to final distribution, stringent quality assurance protocols guarantee product integrity and reliability. Investing in employee training empowers staff to uphold these standards while enabling efficient problem-solving and customer engagement.

Continuous feedback loops from customers provide invaluable insights for ongoing improvement and adaptation to evolving market demands. By adopting these comprehensive strategies—focused on regulatory readiness, cultural adaptation, innovation excellence, brand integrity, and quality assurance—the company can fortify its position in the global market, capitalize on growth opportunities, and navigate challenges effectively, ensuring sustained success and market leadership in the food manufacturing sector.

Based on the key findings from the case study analysis, the company may adopt some sustainable practices to enhance its growth and operational effectiveness. Localizing the market research is one of the sustainable practices for tailoring products and marketing strategies. Perhaps, this approach fosters better consumer acceptance and brand loyalty. Besides, the company may allocate resources to research and development with a focus on sustainability. For instance, the products could be innovated to be more eco-friendly, whether through sustainable sourcing, reduced packaging, or lower environmental impact in production processes. In terms of brand building and marketing, the company should craft localized marketing campaigns that are culturally sensitive to resonate with a local audience. By maintaining brand trust through consistent quality and responsiveness will enhance the company's reputation. This approach therefore will build a positive reputation. Apart from that, since the company studied in this paper is from the food manufacturing sector, the company has to ensure high standards across the supply chain with strict quality control measures.

5. Managerial Implications and Recommendations

Looking ahead, the company possesses several promising prospects that can pave the way for its future growth and success in the competitive food manufacturing industry. Initially, the company has demonstrated a robust capability for international expansion, successfully entering markets in ASEAN, Europe, and West Asia. Building upon this foundation, prospects include further geographical diversification into new regions and countries, leveraging its established reputation for quality and innovation to capture additional market share and broaden its global footprint.

Furthermore, the company is well-positioned to capitalize on opportunities arising from product diversification and innovation. Initially focusing on snacks, rojak gravy, and agricultural products, the company can expand its product portfolio to include healthier alternatives, convenience foods, and specialized dietary options. By investing in research, the company can introduce new products that cater to evolving consumer preferences for the development of nutritious, sustainable, and ethically sourced foods, thereby enhancing market relevance and competitiveness.

Perhaps, the company's proactive approach to brand building and marketing presents significant opportunities for future growth. Leveraging digital platforms, social media, and targeted marketing strategies, the company can strengthen brand visibility and engagement both domestically and internationally (Mariani et al., 2016). Enhanced brand recognition will not only attract new customers but also foster brand loyalty among existing ones, driving sustained revenue growth and profitability.

Moreover, the company's commitment to maintaining high standards of quality and customer satisfaction serves as a cornerstone for future success. By continuously improving production processes, ensuring product consistency, and providing exceptional customer service, the company can reinforce its reputation as a trusted provider of high-quality food products. This dedication not only enhances customer retention but also supports premium pricing strategies and positions the company as a preferred choice in competitive markets.

Towards the end, embracing sustainability initiatives and responsible business practices can further differentiate the company in the marketplace. Patel (2023) claimed that by integrating environmentally friendly practices across its operations, from sourcing ingredients to packaging and distribution, the company can appeal to increasingly eco-conscious consumers and meet regulatory requirements for sustainability. This strategic focus not only aligns with global trends toward sustainability but also opens doors to new market segments and partnerships, driving long-term growth and profitability.

Based on its strong foundation, commitment to innovation, robust marketing strategies, and focus on quality and sustainability efforts, the company is poised to capitalize on future opportunities, expand its market

presence, and achieve continued success in the dynamic and evolving food manufacturing industry.

Conclusion

In conclusion, based on the case study, the company is indeed providing valuable insight into the critical factors that drive the success of SMEs. Over the years, the company has demonstrated and proven how a combination of strategic vision, unwavering commitment to quality, and continuous innovation can transform a small startup into an internationally recognized brand.

It is necessary to stress that loyal customers and their retention depend on the quality and the level of their satisfaction. Some of the key success factors that have led to the actualization of the company's goal include the reliable production of quality goods. However, overcoming growth challenges through product diversification demands significant investment in research and development. Market testing and feedback are essential for continuous innovation to align with consumer needs. On the other hand, the company also maintains brand integrity by providing quality products and responsive customer service to foster customer loyalty. Lastly, by implementing rigorous quality control measures throughout the supply chain will ensure product integrity. In doing this, employee training and continuous customer feedback loops are vital to maintaining high standards and adapting to market changes.

In summary, to navigate growth challenges, ensuring profitability while sustaining the business requires the company to focus on regulatory compliance, culture adaptation, sustainable innovation, and rigorous quality assurance. Other SMEs can learn from the story of the company and apply similar strategic techniques in overcoming barriers and grasping developmental opportunities. The case shows that there exists an opportunity for SMEs and how such a global business may attain splendid success and indeed compete in the global market with vision, high determination, and proper planning.

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The Effect of Artificial Intelligence (AI) on Students' Learning

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Abstract: Various studies have been conducted to identify factors that contribute to student engagement, personalized learning experience, and student academic performance. The evolution of technology offers various benefits including in the education sector. To date, the use of Artificial Intelligence (AI) in education has been seen to provide various benefits. This study aims to identify the relationship between the usage of AI with student engagement, personalized learning experience, and student academic performance. Data was collected from 110 undergraduate students from the Faculty of Business and Management, UiTM Puncak Alam Campus using a questionnaire. 106 data were analyzed using SPSS version 29. The findings show that AI usage for study purposes significantly influences student's engagement and academic performance. On the other hand, the usage of AI and personalized learning experience show no significant influence. This study not only provides a deeper understanding of the context of AI usage for better student engagement and academic performance but also gives valuable insight for UiTM and faculty specifically to develop strategies and modules that enhance the implementation and usage of AI in their learning activities.

Keywords: *Artificial Intelligence (AI), Student's Engagement, Personalized Learning Experience, Academic Performance.*

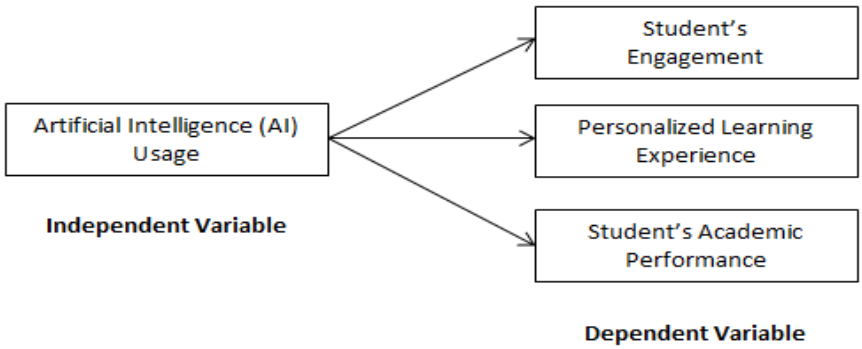
1. Introduction and Background

The 21st century has witnessed a rapid evolution of technology, particularly in Artificial Intelligence (AI), which refers to digital machines performing tasks akin to intelligent beings. This surge in AI has garnered global interest for its potential to revolutionize various societal aspects, including education. Nations are actively advancing their AI industries and exploring its implementation in education to enhance learning experiences (Chiu et al., 2023; Kang, 2023).

Contrary to common misconceptions, AI transcends mere replication of human intellect; it facilitates individualized learning, catering to each student's unique needs across diverse categories (Okunlaya et al., 2022). Research by Chiu et al. (2023) delves into AI technologies like chatbots, robots, and intelligent tutoring systems, emphasizing their role in providing adaptive learning experiences, aiding teachers in understanding student learning processes, and offering timely support anywhere, anytime. Due to continuous advancements in AI technologies, including learning, teaching, assessment, performance, engagement, and administration, AI's impact spans various educational domains (Kang, 2023). For instance, AI-powered university libraries leverage vast data to tailor resources, meeting individual student needs effectively (Okunlaya et al., 2022). This notion aligns with Cox et al.'s (2018) perspective, highlighting how AI-driven libraries can bolster learning through personalized strategies.

This study aims to investigate how AI influences student learning outcomes, such as engagement, personalized experiences, and academic performance. This underscores the pressure on students to compete effectively in higher education, leveraging technological advancements to maximize their potential (Huang et al., 2023). Notably, AI in education holds significant potential to enhance learning, teaching, assessment, and administrative processes, thereby reshaping educational methodologies (Chiu et al., 2023). In meeting these objectives, a conceptual framework as shown below has been developed:

Figure 1: Conceptual Framework



In conclusion, the integration of AI in education signifies a significant area of study, shaping the future of learning. Its potential to enhance student outcomes, foster personalized learning experiences, and optimize educational processes underscores its importance in contemporary education. As AI continues to evolve, its role in education is poised to grow, offering novel opportunities for learners and educators alike.

2. Literature Review

Student Engagement: Student engagement is the key to academic success and well-being, involving active participation and investment in learning. Engaged students are motivated, achieve academic success, and remain in school. Classroom interactions fostering collaboration, critical thinking, and practical knowledge application enhance engagement. Educators utilizing creative teaching methods, technology, and student-centered approaches facilitate active learning and sustained engagement (Lee & Hannafin 2016). Extracurricular activities and social interactions complement classroom engagement, strengthening students' sense of belonging and facilitating personal development (Kuh, 2009). Institutions emphasizing a comprehensive learning environment, diverse perspectives, and student agency will enhance overall engagement and achievement.

According to Moraes et al. (2023), technologies associated with Industry 4.0 have the potential to enhance learning processes for both students and educators by increasing engagement and interaction, enhancing soft skills, and promoting collaboration while also reducing costs and risks for universities. In the case of students, learning and striving can be optimally increased when help is provided in negotiating multiple comprehension strategies through various forms of interaction, incentives, assistance, and regular feedback (Bolliger & Martin, 2018). As regards students' engagement in collaborative online learning environments, they report that engaging in steering online discussions will add to the feeling of learning community among students (Shackelford & Maxwell, 2012; Zhang et al., 2018). This learner-instructor relationship will provide favorable results in relation to learners' gratification and performance as far as online learning is concerned (Andersen, 2013; Kang & Im, 2013; Walker, 2016).

Following a review of sixty-eight articles concerned with the effects of AI on students and their perceptions, researchers were struck by evidence suggesting that motivational and engagement aspects in the framework of student learning outcomes accounted for 34%. Multiple studies on the use of AI-enabled robots in enhancing student engagement in physical education, computer science, and mathematics in K-12, and higher educational institutions have been done in different contexts (Chiu et al., 2023; Xia et al., 2022; Ilić et al., 2021; Kuleto et al., 2021; Yang, Oh, & Wang, 2020). Furthermore, it was observed that students with lower academic achievements reported that engaging with AI Robots enhanced their feeling of safety and productivity, while also reducing their feeling of shame. Moreover, learners of language were also observed to have their engagement increased by autonomous scoring systems based on image and speech recognition technologies (Fu et al, 2020). AI-aided assessment incorporated active learning strategies since it was considered more reliable and students enjoyed the active feedback with no delays.

According to Kazu & Kuvvetli, 2023, virtual reality education incorporates the use of virtual reality technology to create engaging learning environments that improve involvement and learning outcomes. It has been established that, in virtual environments, AI can be employed to deliver tailored learning experiences for the students as well as give the students real-time assistance and feedback (Tiwari, 2023). Just like virtual education, educational AI games also use game-based integration to enhance involvement and learning outcomes and AI can be used to further target specific aspects within the games (Baker and Ryan 2019). Baker and Ryan (2019) further point out that AI technology can be employed to modify the difficulty of certain gameplay tasks, give professional guidance to players, and generate educational content that is relevant to the learners. Tiwari, 2023 points out the significance of such means in elevating the learning experience for students, however, it is imperative to study the limitations of AI systems in game development and virtual reality education. In addition, particular categories of risks should be investigated including ethical issues and societal issues related to AI employment in such areas. Furthermore, it is important to create AI policies that enhance student privacy, fairness and transparency (Tiwari, 2023).

Most of the AIEd papers that were reviewed indicated that the use of AI technology would help enhance students' participation and preparedness for 21st-century skills. However, the merits were mainly reaped by the most skilled and dedicated students. This observation has two probable explanations: (i) AI technologies for student learning are inadequately conceived and developed, and (ii) teachers do not have the requisite pedagogical knowledge to use the technologies. More vulnerable students who required more help would have been turned off by the application of AI technologies because they encountered communication barriers with the AI agents and did not find the suggested learning resources useful. Hence, the application of AIEd in its entirety or part may lead to or aggravate the existing digital divide and the continuing injustice of education. Future studies should concentrate on developing AI as an advanced learning context as well as developing AI algorithms for tailored learning interventions using a learning sciences perspective Luckin & Cukurova (2019). Hence the following hypothesis was proposed.
H1: There is a relationship between AI usage and student engagement.

Personalized Learning Experience: Personalized learning, as described by Hutchins (2017), involves tailoring educational content to meet the unique needs of individual students, allowing customization in pace and knowledge level. This approach, traditionally associated with K-12 education, has expanded into higher education, with institutions like Ohio State University piloting adaptive programs targeting a 20% implementation rate by 2019 (Hutchins, 2017). The integration of gamification elements, such as leaderboards and points, is explored to enhance the quality of education by recording student progress and addressing the challenge of balancing learning speeds (Hutchins, 2017).

The popularity of personalized learning is attributed not only to educational demand but also to companies seeking to sell software (Hutchins, 2017). The emergence of AI-enabled robotics in education, discussed by Linert and Kopacek (2016) provides child-friendly interfaces and hands-on experiences for teaching programming, robotics, mathematics, and biology. An example like Cubelets, a kit of modular robot blocks, which demonstrates the diversity of capabilities achievable through combinations (Linert & Kopacek, 2016). However, concerns about AI robots replacing teachers and impacting social mechanisms are raised, with a focus on addressing diverse learning curves and potential challenges in handling behavioral or psychological issues (Hutchins, 2017). Notably, developments like the NAO robot, designed by Aldebaran Robotics for children with autism, contribute to understanding the Uncanny Valley and guide the creation of robots that avoid triggering negative reactions (Hutchins, 2017; Linert & Kopacek, 2016).

The importance of digital technology is undeniable, it influences the way we access information, interact with others, and even behave in our daily lives. This digital revolution has profoundly impacted the educational landscape, leading to the integration of digital culture into an increasing number of educational programs worldwide. In France, for instance, internet technology courses are now offered at the primary school level, and high school students are required to demonstrate computer proficiency through standardized exams. Furthermore, it is common for educational institutions to use Learning Management Systems (LMS) which facilitate students' access to and engagement with learning materials. In recent years, interactive instructional technologies have gained significant traction. Tablets are replacing traditional textbooks, and educators are increasingly incorporating diverse learning tools such as Google Classroom, Edmodo, PowerSchool, and Moodle

into their teaching practices [Chassignol et al., 2018].

Though AI has a lot of prospects within education, questions regarding its impact on students, and their potential to attend to AI systems and instructors remain a dilemma. Students, for example, might view the process of gathering and analyzing data through AI as monopolization and a breach of their privacy, particularly given such incidents as the Cambridge Analytica experience (Chan, 2019; Luckin, 2017). In addition, the use of an AI system without addressing the issues of data and algorithmic bias can reinforce discrimination and ethical issues (Crawford & Calo, 2016; Murphy, 2019). On the flip side, the teachers are also skeptical that extreme incorporation of AI systems will impede the improvement of necessary skills like independent learning, creative problem-solving, and critical thinking (Wogu et al., 2018). It, therefore, follows that both student's and instructors' views and apprehensions regarding the role of AI systems in virtual learning spaces must be investigated and comprehended exceedingly well (Cruz-Benito et al., 2019). It will be vital to address these problems in advance to shape trust towards AI systems and make sure AI is integrated into the education sector, most ethically.

Within the AIEd community, understanding the role of AI systems in online education is becoming a new hot topic. Roll and Wylie (2016) have even called for more AI systems to be deployed to improve student-instructor interfaces and learning experiences outside the constraints of the classroom or the school environment. Nevertheless, Zawacki-Richter et al. (2019) presented a systematic mapping of AIEd publications from 2007 to 2018 and identified one of the shortcomings of this period a lack of discussion about ethical issues and risks AI systems entail for the interaction of learners and instructors. Likewise, Popenici and Kerr (2017) researched the education process considering AI systems but also delineated the places where conflicts between students and teachers could arise. This includes invasion of privacy, the rise of power imbalance, and disproportionate control among others. All these studies pointed towards conducting further studies to comprehend well the processes with AI systems and concern interaction between students and tutors in particular. A more refined knowledge such as this will be crucial in finding and correcting any existing gaps, challenges, or barriers to the maximization of AI in education.

Although AI systems offer potential benefits for instructional communication, several concerns warrant attention as outlined by Seo et al. (2021). First, students express concerns about accountability, particularly when AI systems generate unreliable or inexplicable responses that lead to negative outcomes. Second, although AI systems can facilitate personalized learning experiences, there is a risk of over-standardization. If AI dictates the "correct" responses of behaviors for engaged students, it could stifle creativity and individual learning styles. Third, while AI can enhance the perceived connection between students and instructors, the use of technologies like facial expression analysis or eye tracking raises privacy concerns. Students may feel uncomfortable with the assessment of their unconscious behavior perceiving it as intrusive monitoring. Therefore, the hypothesis is formulated as follows:
H2: There is a relationship between AI usage and student's personalized learning experience.

Student's Academic Performance: The assessment of a student's, teacher's, or institution's degree of success in meeting their learning objectives is known as academic performance or achievement. Determining a student's standing in a university requires evaluating their academic performance. Throughout a semester, this procedure helps decision-makers, academic staff, and educational administrators to accurately assess students in a variety of courses. It also serves as a warning to students to evaluate their performance and take the required actions to get better (Al Husaini & Shukor, 2022). Academically gifted students typically have high self-esteem and confidence, low anxiety and despair, sociable tendencies, and are less prone to substance abuse, such as alcohol. Academic performance is said to be influenced by several individual and family factors in addition to the quality of the institution, including socioeconomic status, English language ability, attendance, job, high school grades, and academic self-efficacy. Additionally, there is a relationship between academic accomplishment and variables including parental involvement, family size, study hours, and competencies of a teacher (Tadese et al., 2022).

Due to the last decade's technological advances in areas such as social media, sensors, mobile devices, and online learning environments (e.g. MOOC, LMS, and intelligent tutoring systems), educational psychologists today have improved access to large data. This situation has resulted in the availability of more diverse and

complicated data sets such as, but not limited to, student personal information, physiological information, academic records, learning history, and others (Daniel, 2015). Learning analytics and machine learning in combination with big data technologies have been reported to be effective in predicting school performance (Huang et al., 2020). However, very few studies have investigated learning analytics programs and AI applications in education systems. According to Liu et. al, (2020) on the other hand, recent studies have reported encouraging results in relation to increasing students' academic success and retention and helping teachers in instructional design and teaching strategy improvement.

The enormous potential to change education systems has seen a strong response from stakeholders as the world is currently investing a lot of efforts in research and development as well as infrastructure building. A case in point is the United States where institutions are being incentivized, and organizations are being funded to create AI-driven individualized learning systems. Such systems are designed to foster higher student performance through better cognitive engagement as well as address educational disparities by providing disadvantaged populations with support that is tailored to their needs (Boninger et al., 2020; Williamson & Eynon, 2020). These efforts also underline the increasing acknowledgment of AIEd as an important field of research that is capable of revolutionizing the learning paradigms in the future (Holmes et al., 2021). The attention triggered by artificial intelligence is broad and encompasses the entire domain of education: learning, teaching and assessment, and even institutional management (Gonzalez-Calatayud et al., 2021; Luckin, 2017). The keenness with which the OECD responds to such recommendations was well captured by Kuhl et al. (2019) who quote the Organization as saying that AI-based research should not only be activity-based. The OECD promotes the application of learning analytics and big data technologies to enhance educational activities.

In terms of academic achievement as a learning outcome, the role of AI was mentioned in 29% of the articles published and reviewed. Most of the researches indicate that in the context of AI technologies academic performance increases (Chiu et al., 2023), and out of the two studies that did not indicate such significant performance improvement, it was stated that there was an enhancement of students' interest and confidence in learning (Topal et al., 2021). The research, which focused on the role of artificial intelligence in enhancing learning outcomes, reported that AI did not only enhance the performance of the mainstream but also the performance of special needs students (Chiu et al., 2023), for instance, an Artificial Intelligence based braille instructor was made for teaching the visually impaired students and it was observed that when teachers used the AI tutor, the pupils responded significantly quicker and more accurately.

Nevertheless, some studies provide evidence that not all kids benefit from these AI technologies since these are mostly or only high achievers or those who have the will to do so. For instance, among kindergarten children, only those who had average-level handwriting skills were able to outperform the head of beginner-level learners in AI learning (Bonneton-Botte et al 2020). Only the most accomplished students in schools had great dealing with chatbots (Chiu et al. 2023). Less accomplished students appreciated the use of the system whereas more accomplished ones got bored with it (Nabiyev et al, 2013). Most of the researchers however claim that AI has the capacity to boost the students' achievements but only when the participation of the teachers in the teaching and learning activities is there. Moreover, apart from improving the quality of students' learning in the classroom, there is a possibility that the use of Artificial Intelligence technologies would reduce the level of students' indifference to a great extent. They have been able to establish the learning state of the students, assist program officers or teachers in academic intervention, and eventually reduce students' dropping out (Tsai et al, 2020; Villegas-Ch et al, 2021). Hence, it is hypothesized that:
H3: There is a relationship between the AI usage and student's academic performance.

Artificial Intelligence Usage: AI has emerged as an integral part of several sectors, altering the way businesses and personnel engage with technology. In medicine, artificial intelligence assists with the analysis of medical images, develops new drugs, and incorporates customized treatment plans, thus improving the processes of diagnosis significantly (Topol, 2019). Moreover, in the finance area, AI-based techniques are employed in the areas of fraud detection, risk, and automated trading, allowing for the swift assessment and execution of trades (Paramesha, 2024). Customers do not lag as such foremost AI is utilized through chatbots employing natural language processing to assist users and respond to queries more effectively and rapidly, thus enhancing the customer experience (Mohanty, 2023).

In addition, the manufacturing industry is also undergoing evolution with the introduction of smart factories which are powered with a variety of AI technologies. For example, these smart factories are integrated with tools that assist in automating processes, predictive maintenance, and implementing quality assurance systems to improve efficiency and minimize operational idle time (Davenport & Ronanki, 2018). One more significant application is the implementation of AI in self-driving cars where AI systems are designed to take input signals from the sensors and make timely decisions creating efficient and safer transport systems (Garikapati & Shetiya 2024).

In the area of education, Artificial intelligence (AI) systems assist effectively in online learning and teaching, automating instructors' mundane activities; personalizing learning for students; and adaptive evaluation (Seo et al, 2021). Would it be wise to pursue Artificial intelligence-based solutions in the educational domain? The use of artificial intelligence (AI) has made visible changes in educational processes and management in the last few years. This progression enables the educational model to be more multidimensional in terms of human, non-human, and their presence on the web. The potential offered by AI technologies has been proven in various domains, including intelligent buildings (Martínez-Comesanã et al., 2023; Troncoso-Pastoriza et al., 2022) as well as learning spaces (Martínez-Comesanã et al., 2023).

AI has been advancing rapidly in the field of education as it has the algorithmic ability to provide recommendations, forecasts, and make decisions in addition to the ability to adapt to different circumstances (Chen et al., 2022). The intent of AI in Education (AIEd) is to assist educators in discharging their responsibilities more easily and productively. As of now, around 40 % of the teaching time spent on some activities that can be automated shows great prospects for AIEd (Alam, 2021). In general, AI's application in education can significantly enhance numerous components or tools, including but not limited to individualized instruction; flexible testing; smart tutoring; automatic assessment; virtual reality for education; data mining for educational performance forecasting; learning a foreign language; and focus on accessibility and inclusiveness (Beaulac & Rosenthal, 2019; Xu et al., 2019).

3. Research Methodology

A correlation study was conducted to identify the influence of AI usage on student engagement, personalized learning experience, and student's academic performance among undergraduate students at UiTM Puncak Alam campus. The population of this study consists of students from Bachelor of Business Administration (Hons) Human Resource Management with a total number of 155 students from semester 5. The questionnaire survey was used as the instrument for data collection utilizing the 5-point Likert Scale for dependent variable (DV) and independent variable (IV) sections. Questionnaire items for Artificial Intelligence Usage were adopted from Von Garrel, J., & Mayer, J. (2023). As for the dependent variables sections, the items were adopted from Xu et al.(2023) for the Student Engagement variable. Items for Personalized Learning Experience were adopted from Cheng, L. et al. (2023), and items for Student's Academic Performance variable were adopted from Pacheco-Mendoza et al. (2023). A total of 110 questionnaires were distributed to respondents. After three weeks of the collection period, 96.36% of the return rate was achieved and a total of 106 questionnaires were analyzed using SPSS version 29. The analyses carried out for this research are descriptive demographic analysis, correlation, and regression analysis.

Table 1: Questionnaire Design

Variable	No of items	Adopted from
Artificial Intelligence in Education (IV)	9	Von Garrel, J., & Mayer, J. (2023).
Student's Engagement (DV1)	6	Xu et al.(2023)
Personalized Learning Experience (DV2)	6	Cheng, L. et al. (2023).
Student's Academic Performance (DV3)	9	Pacheco-Mendoza et al. (2023).

4. Results

The outcome of the data analysis is presented in this section. This includes the discussion of the demographic profile of respondents, as well as the results for reliability, correlation, and regression analysis.

Profile of Respondents: Table 2 displays a summary of the demographic profile of respondents. Frequency analysis was used to examine respondent's demographic characteristics which include gender, age, classes, current CGPA, and frequency of AI usage for study purposes. Based on the analysis, the majority of the respondents were female which represented 72.6% (n=77), followed by males (29.4%, n=29). Most of the respondents were between 21-23 years old (78.3%, n=83), while 20 respondents (18.9%) were between 24-26 years old. Meanwhile, the lowest frequency of age group was 3 respondents (2.8%) between 18-20 years old. In term classes, 27 respondents (25.5%) were from group BA2435C, while 25 respondents (23.6%) were from BA2435E. The total numbers of students from BA2435B, BA2435D, and BA2435A were 21 (19.8%), 18 (17%), and 15 (14.2) respectively. In terms of AI usage for study purposes, the majority of respondents (n=60, 56.6%) agree that they always use AI for study purposes. The remaining 40 respondents (37.7%) use AI occasionally and 6 respondents (5.7%) rarely use AI for study purposes.

Table 2: Demographic Profile

VARIABLE	FREQUENCY	PERCENTAGE
GENDER		
Males	29	27.4%
Females	77	72.6%
Total	**106**	**100%**
AGE		
18-20	3	2.8%
21-23	83	78.3%
24-26	20	18.9%
Total	**106**	**100%**
CLASS		
BA2435A	15	14.2%
BA2435B	21	19.8%
BA2435C	27	22.5%
BA2435D	18	17%
BA2435E	25	23.6%
Total	**106**	**100%**
CURRENT CGPA		
1.00-2.00	-	-
2.01-3.00	12	11.3%
3.01-4.00	94	88.7%
Total	**106**	**100%**
FREQUENCY OF AI USAGE FOR STUDY PURPOSES		
Rarely	6	5.7%
Occasionally	40	37.7%
Always	60	56.6%
Total	**106**	**100%**

Reliability Analysis: Reliability analysis was conducted to measure the consistency of the items used in this study. According to Salkind (2009), Cronbach's Alpha value higher than 0.6 indicates a strong association. Based on Table 3, it is shown that Cronbach's Alpha value for AI usage is 0.881 indicating the items used to measure this variable are strongly reliable. The alpha value for student engagement also showed a strong reliability of 0.882. As for personalized learning experience, 3 items have been removed from the analysis to get the alpha value of 0.870. Similarly, 2 items were removed from the analysis for the student's academic performance variable which leads to an alpha value of 0.880.

Table 3: Result of Correlation and Reliability Analysis

No	Variables	Mean	SD	1	2	3	4
1.	AI Usage	4.019	0.712	(0.881)			
2.	Student's Engagement	3.907	0.735	0.614*	(0.882)		
3.	Personalized Learning Experience	3.068	0.389	0.188	0.255**	(0.870)	
4.	Student's Academic Performance	4.017	0.573	0.605**	0.583**	0.115	(0.880)

Notes: **significant at the 0.01 level (2-tailed); Cronbach's alpha values are shown in the parentheses.

Correlation Analysis: Referring to Table 3, the result of the correlation analysis indicated a significant association between AI usage and student engagement. The result showed a moderate association with r=-0.614 ($p<0.01$). Similarly, there is also a significant association between AI usage and students' academic performance that indicated with moderate association between the variables (r=-0.605, $p<0.01$). However, the result revealed that there is no significant association between AI usage and personalized learning experience with the value of r=-0.188 ($p>0.01$).

Table 4: Model Summary of Regression Analysis

Dependent Variable	Summary		ANOVA	
	R^2	Adjusted R^2	F	Sig.
Student's Engagement	0.376	0.370	62.783	<.001
Personalized Learning Experience	0.035	0.026	3.792	.054
Student's Academic Performance	0.366	0.360	60.004	<.001

Independent variable: Artificial Intelligence (AI) Usage

Regression Analysis: Three separate regression analyses were conducted to identify the relationship between the independent variable (AI usage) and dependent variables (student's engagement, personalized learning experience, and student's academic performance). Based on the results in Table 4, the R^2 value score for AI usage and student engagement is $R^2=0.376$. This result indicated that the independent variable influenced 37.6% of the dependent variable and the remaining 62.4% of the variance that attributed to the dependent variable came from other factors. As for the relationship between AI usage and personalized learning experience, the R^2 score ($R^2=0.035$) indicated that AI usage only contributes 3.5% towards personalized learning experience. The remaining 96.5% variances come from other factors that were not investigated in this study. Moreover, the R^2 value of 0.366 derived from AI usage and students' academic performance explained that AI usage among students contributes to 36.6% of student's academic performance. The remaining 63.4% come from other factors that are not included in this study.

Table 5: Regression Coefficient Analysis

Variables	Standardized Coefficients Beta
Student's Engagement	.614*
Personalized Learning Experience	.188
Student's Academic Performance	.605*

Independent variable: Artificial Intelligence (AI) Usage

The regression result in Table 5 shows two results show a significant relationship between the variables. There is a positive relationship between AI usage and student engagement with the value of $\beta=-.614$ with $p<0.05$. Other than that, AI usage also significantly influences student's academic performance as shown by the value of $\beta=-.605$ with $p<0.05$. However, AI usage does not show any significant relationship with personalized learning experiences among students.

Discussion: The findings from the demographic profile show that more than half of the respondents in this study utilize AI for study purposes. As for the relationship between variables, this study revealed that only H1 and H3 were accepted, while H2 was rejected. The findings explained that AI usage for study purposes among students does significantly improve student engagement and student's academic performance. Overall, this finding indicates that the usage of AI for education has become a trend among students, which is used to facilitate student's engagement in learning sessions and exploration of knowledge. Furthermore, AI also

enables students for information searching which supports better comprehension and thus improves their academic performance compared to traditional methods.

5. Managerial Implications and Recommendations

This study expands our understanding of how AI usage for study purposes influences students' engagement, personalized learning experience, and student's academic performance among undergraduate students. This study provides evidence that increased use of AI will improve student's engagement and academic performance. Due to this fact, it is crucial for the faculty specifically to facilitate the use of AI in classroom sessions so that the potential of AI in learning settings can be explored and used ethically by students. Proper strategies and modules can be developed to embed AI elements in delivery and assessment methods. Although the usage of AI does not significantly influence students' personalized learning experience in this study, it is worth future research to explore more on these variables as to what condition AI can facilitate self-learning among students.

Conclusion: In conclusion, the evolution of AI especially in the education sector cannot be denied as there is evidence of its increasing adaptation by students to enhance their learning experiences. AI has the potential to significantly improve learning effectiveness thus leading to better learning performance. This study suggested that AI usage for study purposes influences student's engagement and academic performance. Thus, it is crucial for higher education institutions to actively promote and integrate AI into their pedagogical practices. Developing comprehensive strategies and modules that seamlessly embed AI within the teaching and learning context will be paramount. This study contributed to a better understanding about condition under which AI usage can effectively foster student's engagement and enhance academic performance.

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A Study of Long-Run Equilibrium Relationship Between Foreign Direct Investment and Its Key Determinants in Malaysia

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Abstract: This study investigates the long-run equilibrium relationship between foreign direct investment (FDI) and its key determinants in Malaysia. Employing the Autoregressive Distributed Lag (ARDL) model on annual data between 1971 and 2021, it aims to identify the factors influencing FDI inflows and assess its impact on the Malaysian economy. The key findings confirm a long-run equilibrium relationship between FDI and the selected macroeconomic variables as a group. However, the individual impact of gross domestic product, inflation, exchange rate, and trade openness on FDI is not statistically significant when analyzed separately. Specifically, the long-run results suggest that the determinants do not have significant effects on FDI. Meanwhile, the short-run relationship between FDI and its determinants in Malaysia reveals a complex interplay of factors. Inflation and exchange rates play significant roles, with inflation generally encouraging FDI and exchange rate volatility creating mixed effects. Trade openness on the other hand shows some short-run significance but it is not consistently impactful. The error correction (ECM) model also confirms the existence of a long-run relationship. It highlights that while short-term fluctuations can occur, FDI tends to move towards a long-term equilibrium influenced by a relatively moderate speed of adjustment. The key conclusion implies that FDI is influenced by the combined effect of these variables in the longer term, but the individual contribution of each variable is not strong enough to stand out statistically. This research contributes to the understanding of FDI dynamics in Malaysia by providing insights, thereby informing policymakers and investors about effective strategies to attract and leverage FDI for sustainable development. It also indicates that the relationship between FDI and macroeconomic variables is more complex, involving other underlying factors or non-linear dynamics.

Keywords: *Foreign Direct Investment, Gross Domestic Product, Inflation, Exchange Rate, Trade Openness, ARDL Model, Malaysia.*

1. Introduction and Background

Foreign Direct Investment (FDI) is a significant investment made by a firm or individual in one country into business interests located in another country. It can be classified into Greenfield and Brownfield Investment categories (Rani, 2023). FDI is crucial for economic growth and development, providing benefits such as capital inflow, technology transfer, employment prospects, and globalization. As stated by Bakar et al. (2022) factors influencing a country's appeal include market size, growth potential, political and legal factors, financial factors, labor market factors, trade and investment policies, and social and cultural impact. Technological advancements can introduce novel managerial practices and skills development technologies, while multinational corporations can enhance local personnel through training and development initiatives. Environmental impact is another factor that influences FDI, with the implementation of advanced and environmentally friendly technology being beneficial but potentially damaging to the environment if corporations capitalize on inadequate ecological regulations (Saqib & Dinca, 2024).

According to Boltayev (2024), social and cultural impact also influences FDI, with cultural exchange promoting ideas and cross-cultural interactions, while foreign cultural values can facilitate the erosion of local cultures. FDI faces various risks and challenges, including political and economic risks, regulatory and compliance risks, operational risks, and integration challenges. In recent decades, there has been a transition in FDI migration from developed to developing countries, particularly in Asia and Africa. Services and high-tech industries have become the primary focus, with Asia, particularly India and China, being the first recipients due to their substantial markets and development potential. Economic reforms have made FDI more appealing to numerous countries, with Western Europe being a traditional hub due to its skilled populace and stable

economic environment. Global FDI volumes decreased by 12.4% in 2022, reaching a total of USD1.3 trillion. The majority of this decrease occurred in developed economies, where FDI decreased by 36.7% to USD 378 billion. In contrast, FDI flows into developing economies increased by 4.0%, reaching a historic high of USD 916 billion. However, this increase was only uniform across some regions (UNCTAD, 2022). In 2022, developing Asia and Oceania were the largest recipients of FDI, representing half of the global inflows.

Foreign direct investment (FDI) has emerged as a crucial catalyst for economic growth and development in many countries, including Malaysia. Of late, however, it has become a concern for Malaysia to maintain its appeal as an FDI destination. Malaysia is faced with confronting rising challenges related to environmental sustainability, regulatory transparency, and global economic volatility (Subramaniam, 2021). There are various factors influencing FDI in Malaysia including market size and growth, natural resources, infrastructure, political stability, financial factors, labor market factors, trade and investment policies, and investment incentives (Hatim et al., 2024). The major components of FDI include an increase in GDP, development of the industrial sector, competitiveness in the export market, technological advancements, employment and skill development, and social and environmental impact (Zaharum et al., 2024).

Despite the many factors that have been identified in the past literature, Malaysia is still finding it a challenge to maintain its appeal as a popular FDI destination of choice. Therefore, this study aims to delve into both the long-run equilibrium and short-run relationship between FDI and its key determinants within the Malaysian context. The selected macroeconomic variables include gross domestic product, inflation, exchange rate, and trade openness in Malaysia. By understanding these dynamics, policymakers and investors can make informed decisions to identify the factors influencing FDI inflows and assess their impact on the Malaysian economy.

2. Review of the Literature

This section provides a thorough review of the literature relating to the factors that attract foreign direct investment (FDI) into an economy. Several theoretical aspects are also highlighted which include the Production Cycle Theory, Dunning Eclectic Paradigm Theory, and Foreign Direct Investment Internalization Theory (Faruq, 2023). Past studies are critically reviewed ranging from academic papers, journals, and other relevant sources to seek an understanding of FDI-related topics and hence the correct direction for this paper. According to Paul & Feliciano-Cestero (2021), a literature review acknowledges, summarizes, objectively evaluates, and clarifies the antecedent study, henceforth incorporating fundamental theories to clarify the investigation's objective. The methodology and choice of variables applied in prior research on FDI in Malaysia are assessed, with the definition of each explanatory variable and previous findings of relevant studies identified (Miraz & Soo, 2024).

Relationship between Gross Domestic Product and Foreign Direct Investment

Macroeconomic factors, such as GDP, have been widely used as determinants of Foreign Direct Investment (FDI) in various studies. A significant positive correlation has been found between GDP and FDI, with long-term relationships being statistically significant and positive in Malaysia (Al-Matari et al., 2021). This relationship is beneficial for inbound FDI and enhances the gross domestic product, making it an attractive market for foreign investors (Mudiyanselage & Epuran, 2022). FDI can enhance productivity and efficiency by generating positive economic spillover effects.

Policymakers should prioritize continuous improvement and preservation of GDP's upward trajectory to make affected nations more attractive targets for FDI (Ashurov et al., 2020). Increased FDI inflows can stimulate economic activity, employment, and consumer demand, while complementary variables like a strong and expanding GDP can attract higher levels of FDI (Immurana et al., 2023). A well-structured analysis of FDI and GDP dynamics in Malaysia is crucial for fostering economic growth and competitiveness. The causality between GDP and FDI has been the subject of numerous investigations, with Carkovic and Levine (2005) suggesting that GDP may attract FDI and FDI may also influence GDP growth. Market size, which is often approximated by GDP, is a significant factor in determining the positive relationship between FDI and GDP growth. Li and Liu (2005) the relationship between GDP and FDI may be contingent upon other variables, such as human capital, infrastructure, and institutional quality.

According to Nunnenkamp (2002), the correlation between GDP and FDI may differ depending on the industry and country, with variations in the relationship based on sector characteristics, level of economic development, and governance. Financial crises have also been studied, with Bevan and Estrin (2004) stating that economic stability and the prevention of severe recessionary periods are critical factors in the attraction of FDI. Negative GDP growth may serve as a deterrent to FDI inflows, and the relationship may differ based on long-term effects.

Relationship between Inflation and Foreign Direct Investment

Inflation in Malaysia has a significant positive relationship with FDI in both the long and short term, as suggested by Dadu and Payu (2022). However, it also has a substantial and beneficial effect on FDI in Vietnam, Thailand, Indonesia, and Singapore. In other related studies, however, researchers have found that governments must decrease inflation to attract more FDI. The relationship between inflation and FDI in Malaysia is complex, with high inflation rates affecting investment costs, stability, predictability, exchange rate impact, policy responses, and macroeconomic stability (Mudiyanselage & Epuran, 2022). Foreign investors may find it less appealing to invest in companies with high inflation rates due to potential decreases in profit margins and return on investment. Low and consistent inflation rates foster a business environment conducive to growth, increasing investor confidence and attracting FDI.

As stated by Morshed and Hossain (2022), regressors for inflation have been implemented, and policy responses, such as interest rates, can also increase financing costs and impact investment decisions. Consistent FDI is attracted by stable economic conditions, necessitating the implementation of a solid monetary policy to regulate inflation (Azam & Haseeb, 2021). It is also possible for the influence of inflation on FDI to differ between developed and developing countries, with excessive inflation potentially being highly detrimental in developing economies with inferior institutional frameworks and financial markets (Alfaro et al., 2010).

Relationship between Exchange Rate and Foreign Direct Investment

The relationship between foreign direct investment (FDI) and exchange rates has been extensively studied, with various countries showing significant impacts on their economies. In Indonesia, Malaysia, and Vietnam, FDI is adversely affected by exchange rates, while Thailand has a substantial and advantageous influence (Dadu & Payu, 2022). In Singapore, the exchange rate has a positive but insignificant impact on FDI. In Malaysia, the exchange rate has a positive long-term relationship but a negative short-term relationship, impacting investor profitability and risk (Shaari et al., 2023). The study suggests that the exchange rate needs to be increased to account for the variation in inbound FDI, indicating policy implications such as enhancing the investment climate through open trade policies and preserving a stable exchange rate (Mudiyanselage & Epuran, 2022). Exchange rate fluctuations also affect the cost of investment, competitiveness of exports, repatriation of profits, and stability and predictability (Aldalou & Sarsour, 2022).

The exchange rate regime (fixed versus floating) can also influence FDI, with countries with fixed exchange rate regulations attracting a higher volume of FDI due to increased certainty regarding future exchange rates (Klein & Rosengren, 1994). The long-term relationship between FDI and exchange rates may differ by sector, with other variables such as inflation, interest rates, and political stability influencing the relationship (Froot & Stein, 1991). The impact of exchange rates on FDI may differ by country and region, with market size, distance, and cultural connections influencing the relationship (Chakrabarti & Scholnick, 2022). Dunning's Eclectic Paradigm is the most suitable theory for understanding the relationship between FDI and exchange rates, as it explicitly accounts for the impact of macroeconomic factors on FDI decisions (Dunning, 1998).

Relationship between Trade Openness and Foreign Direct Investment

The relationship between trade openness and FDI in Malaysia is crucial for understanding the impact of international trade policies on FDI inflows. Studies have shown that trade openness has a positive long-term relationship with FDI, while the relationship is positive and insignificant in the short term (Mudiyanselage & Epuran, 2022). Trade openness in Malaysia can improve market access, facilitate supply chain integration, align with export-oriented FDI strategies, promote policy coherence, and facilitate technological transfer and knowledge spillovers.

According to Bakdi (2022), trade liberalization is the primary factor influencing FDI in India, with trade openness being the most critical factor for FDI inflow in middle-income economies. However, the relationship

is multifaceted, with factors such as market size, political stability, infrastructure, human capital, and sector-specific considerations also influencing FDI decisions (Rathnayaka Mudiyanselage et al., 2021). Macroeconomic indicators and investor perceptions are essential components of a thorough examination of Malaysia's trade openness and FDI dynamics (Dewi & Hutomo, 2021).

Open trade policies are correlated with more substantial FDI inflows, particularly in developing nations. Trade agreements and common markets can attract FDI through the use of trade agreements and common markets (Globerman & Shapiro, 2002). Export-platform FDI is facilitated by increased trade openness, with economic growth, market size, and other variables mediating the relationship between trade liberalization and FDI in Mexico (Jordaan, 2005). As stated by Asiedu (200) the relationship between trade openness and FDI may differ between developed and developing nations, with financial and trade openness having a more robust impact on FDI. Dunning's Eclectic Paradigm is the most suitable theory for explaining the relationship between trade openness and FDI, as it explicitly evaluates the impact of macroeconomic factors on FDI decisions (Dunning, 1998).

3. Research Methodology

Data for all variables in this study were sourced mainly from the Central Bank of Malaysia and World Bank databases to ascertain how the factors influence FDI in Malaysia. Annual time series data span from 1971 to 2021 and the E-Views 12 software was utilised to analyse the data. Time series data is a sequence of routinely recorded data pieces throughout time. It is widely used in finance, economics, weather forecasting, stock market analysis, and sales forecasting (Sharma & Bandhu, 2023). Time series analysis of temporal dependency also helps in finding the underlying structures, trends, seasonal fluctuations, and patterns (Runge et al., 2023). In this study, the ARDL model is employed to evaluate the data and identify the main elements influencing FDI in Malaysia. It is particularly advantageous because it can be applied regardless of whether the fundamental variables are I(0) (stationary) or I(1) (non-stationary) as seen in Table 4. This model combines GDP, inflation, exchange rate, and trade openness. The functional form model specification is expressed as FDI = f (GDP, INF, EXR, TOP).

Figure 1: The Conceptual Framework

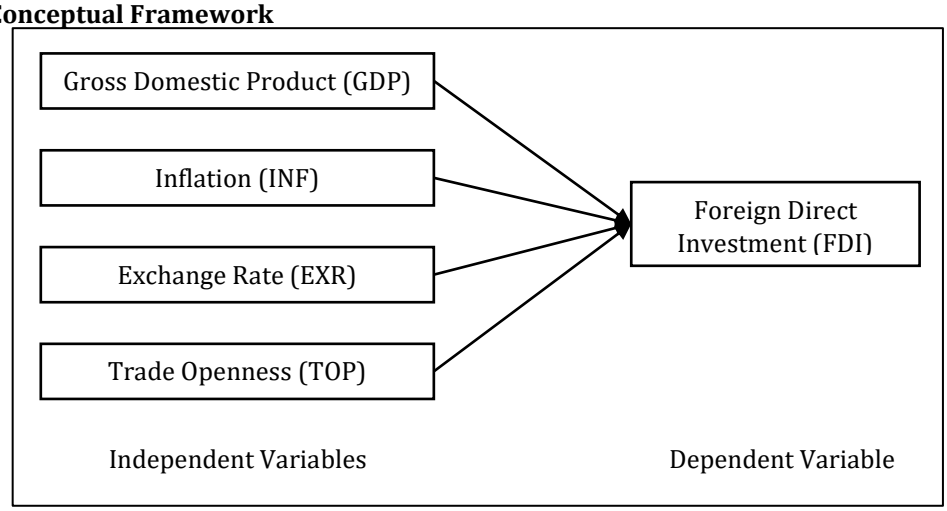


Figure 1 shows the conceptual framework undertaken in this study which highlights the links among variables. In a conceptual framework, the dependent and independent variables are the two most important aspects corresponding with each other. The dependent variable is also known as the criteria variable that mostly interests the study (Bansal et al., 2023). Either favorably or negatively, independent predictor variables will directly affect the dependent variable. Figure 1 shows FDI as the dependent variable, while the other macroeconomic variables (gross domestic product, inflation, exchange rate, and trade openness) are the independent variables that are investigated for its long-run equilibrium relationship in Malaysia for the years spanning between 1971 and 2021.

The main objective of this study is to investigate the long-run equilibrium relationship between FDI and the selected macroeconomic variables including GDP, inflation, exchange rate, and trade openness. The following Table 1 presents a summary of the research objectives (RO), research questions (RQ), and hypotheses statements (HS) that are undertaken in this study.

Table 1: **Summary of RO, RQ, and Hypotheses Statements**

Research Objectives (RO)	Research Questions (RQ)	Hypotheses Statements (HS)
RO1: To examine the impact of GDP on FDI in Malaysia.	RQ1: Does GDP significantly influence FDI in Malaysia?	**H_1: There is no significant relationship between GDP and FDI.** **H_1: There is a significant relationship between GDP and FDI.**
RO2: To analyze the effect of inflation on FDI in Malaysia.	RQ2: Does inflation significantly influence FDI in Malaysia?	**H_2: There is no significant relationship between inflation and FDI.** **H_2: There is a significant relationship between inflation and FDI.**
RO3: To investigate the influence of exchange rates on FDI in Malaysia.	RQ3: Do exchange rates significantly influence FDI in Malaysia?	**H_3: There is no significant relationship between exchange rate and FDI.** **H_3: There is a significant relationship between exchange rate and FDI.**
RO4: To explore the role of trade openness in affecting FDI in Malaysia.	**RQ4: Does trade openness significantly influence FDI in Malaysia?**	**H_4: There is no significant relationship between trade openness and FDI.** **H_4: There is a significant relationship between trade openness and FDI.**

4. Results and Discussion

Section 4 of this research work highlights the empirical results and their analyses. It focuses on the interpretation of descriptive statistics, regression and estimation results which clarify the relationships between variables and address the research problems. The dependent and independent variables involved in this study include foreign direct investment, gross domestic product, inflation, exchange rate, and trade openness. The analysis uses descriptive statistics, correlation matrix, unit root test, optimal lag length selection, ARDL model, Bounds test, and long-run estimation, as well as diagnostic and stability tests. The E-Views 12 software is employed for analysis purposes, with the final goal of investigating the relationship between the independent and dependent variables.

Descriptive Statistics

This section analyses the results that have been obtained for the central tendency and dispersion distribution measurements. Other than investigating the normalcy of the data, unprocessed data have been transformed into logs before estimation. Table 2 presents the central tendency and dispersion results for this study.

Table 2: **Descriptive Statistics**

	Mean	Median	Maximum	Minimum	Std. Dev	Skewness	Kurtosis	ırque-Bera	Probability
FDI	3.7277	3.4502	8.7605	0.0567	1.7429	0.6361	3.7811	4.7362	0.0937
GDP	5.9946	6.2522	11.7011	-7.3594	3.8969	-1.4256	5.4348	29.8716	0.0000
INF	3.3507	2.8132	17.3289	-1.1387	2.9199	2.5645	12.2339	237.0919	0.0000
EXR	3.0824	2.8196	4.3004	2.1769	0.6692	0.3553	1.6283	5.0710	0.0792

TOP	143.3523	136.6891	220.4068	73.3755	41.9883	0.2481	1.8853	3.1637	0.2056

Source: Authors' computation.

Table 2 shows the data on foreign direct investment (FDI) as a percentage of GDP, with an average value of 3.7277%. The data spans from 8.7605% to 0.0567%, with a standard deviation of 1.7429%. The data shows positive skewness and kurtosis of 3.7811, suggesting a flattened curve distribution. The average GDP is 5.9946%, with a middle value of 6.2522%. The lowest recorded GDP is -7.3594%, while the highest is 11.7011%. The data is platykurtic, meaning a positive kurtosis and a flattened curve. Meanwhile, the exchange rate (EXR) and trade openness (TOP) have mean values of 3.0824 and 2.8196, respectively.

Correlation Matrix

The correlation test assesses the linear relationship between variables, evaluating their direction and strength (Baak et al., 2020). It uses a correlation matrix containing FDI, GDP, inflation, exchange rate, and trade openness, and analyses the correlation coefficients thoroughly as depicted in Table 3.

Table 3: Correlation Matrix

	FDI	**GDP**	**INF**	**EXR**	**TOP**
FDI	1	0.4339	0.3715	-0.2399	0.2030
GDP	0.4339	1	0.3047	-0.4630	-0.1378
INF	0.3715	0.3047	1	-0.4395	-0.2639
EXR	-0.2399	-0.4630	-0.4395	1	0.4973
TOP	0.2030	-0.1378	-0.2639	0.4973	1

Source: Authors' computation.

Stationarity Unit Root Test

The test assesses the sequence of integration in each data set using comprehensive dataset analysis to determine stationarity and determine if the data sets are stationary (Ching et al., 2024). It improves the ability to determine if the data sets are stationary. A unit root test is necessary before using the Autoregressive Distributed Lag Model (ARDL). Statistical validation of the unit root test was achieved using the Augmented Dickey-Fuller (ADF) and Philips-Perron (PP) criteria (Efendi et al., 2024). Each trait was considered independently, and their significance was significantly proportional. Two levels are constructed at the level and first difference, using automated lag adjustments to achieve stationary behavior as seen in Table 4.

Table 4: Unit Root Test

Variable	**ADF Test Statistics (with Intercept)**			**PP Test Statistics (with Intercept)**		
	Level	**First Difference**		**Level**	**First Difference**	
FDI of GDP	0.0051*	0.0000*	I(0) I(1)	0.0048*	0.0000*	I(0) I(1)
GDP	0.0000*	0.0000*	I(0) I(1)	0.0000*	0.0001*	I(0) I(1)
INF	0.0025*	0.0000*	I(0) I(1)	0.0025*	0.0000*	I(0) I(1)
EXR	0.8481	0.0000*	I(1)	0.8481	0.0000*	I(1)
TOP	0.3566	0.0001*	I(1)	0.5062	0.0001*	I(1)

* Stationary and significant at 5% level respectively.
ADF: Augmented Dickey-Fuller. PP: Philips-Perron.
Source: Authors' calculation.

The dataset is a mix of connectivity, with some variables remaining constant and others becoming fractionally integrated after the initial difference. Unit root testing determines the dataset's fit for the ARDL model (Efendi et al., 2024). The Phillips-Perron test shows that only FDI, GDP, and inflation variables show stationarity at the

level. Both trade openness and exchange rate are non-stationary at level but show stationarity at the first difference. As stated by Efendi et al., (2024) the ARDL model can fit stationary and first-order integrated variables, making it suitable for studying a combination of I(0) and I(1) variables. However, exchange rates and trade openness become stationary after initial differencing, indicating they must be more differentiated before inclusion in the model (Pesaran & Shin, 1995).

Optimal Lag Length Selection

The optimal ARDL order specification for this study was determined through the automatic ARDL model selection. It is summarized in Table 5. Employing the Akaike Information Criterion (AIC), the ARDL (1,0,3,4,4) configuration was the most successful, with the lowest AIC values of 3.147081 compared to other ARDL order specifications. The criteria graph shows the model selection value for the twenty best models with the lowest AIC value.

Table 5: Optimal Lag Length Selection

Model	FDI	GDP	Inflation	Exchange Rate	Trade Openness	AIC
2401	1	0	3	4	4	3.147081
1776	2	0	3	4	4	3.159708
2276	1	1	3	4	4	3.178428
2376	1	0	4	4	4	3.188037
1151	3	0	3	4	4	3.191609
1651	2	1	3	4	4	3.194737
1777	2	0	3	4	3	3.201104
1751	2	0	4	4	4	3.201709
1152	3	0	3	4	3	3.205975
2402	1	0	3	4	3	3.211172
2151	1	2	3	4	4	3.219270
2251	1	1	4	4	4	3.220062
1827	2	0	1	4	3	3.227389
1652	2	1	3	4	3	3.228887
1026	3	1	3	4	4	3.229453
2277	1	1	3	4	3	3.230653
1126	3	0	4	4	4	3.233728
526	4	0	3	4	4	3.234012
527	4	0	3	4	3	3.234369
1526	2	2	3	4	4	3.236414

Source: Authors' computation.

Autoregressive Distributed Lag (ARDL) Model and Short-Run Estimation

The Autoregressive Distributed Lag (ARDL) model is an econometric technique used to estimate the relationship between a dependent variable and one or more independent variables (Lucky & Elfreda, 2024). It was developed by Pesaran and Shin in 1998 and is useful for analyzing time series data with varying integration orders. The model estimates the relationship between a dependent variable and its own lagged values and other independent variables. In this study, it is employed for estimating the relationship between FDI and macroeconomic variables including gross domestic product (GDP), inflation (INF), exchange rate (EXR), and trade openness (TOP).

Table 6: Estimated Short-Run Coefficient Results

ECM Regression Case 2: Restricted Constant and No Trend				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(INF)	0.240865	0.070105	3.435775	0.0018
D(INF(-1))	0.216115	0.063040	3.428245	0.0018
D(INF(-2))	0.165820	0.060567	2.737785	0.0103

D(EXR)	-1.884031	0.716465	-2.629620	0.0134
D(EXR(-1))	1.702545	0.733168	2.322175	0.0272
D(EXR(-2))	-0.288575	0.699193	-0.412726	0.6827
D(EXR(-3))	-2.866231	0.694275	-4.128377	0.0003
D(TOP)	0.017888	0.018266	0.979295	0.3353
D(TOP(-1))	-0.008839	0.019774	-0.446990	0.6581
D(TOP(-2))	0.038922	0.018779	2.072696	0.0469
D(TOP(-3))	0.038794	0.019271	2.013103	0.0532
CointEq(-1)*	-0.445575	0.083967	-5.306522	0.0000
R-squared	0.754102	Mean dependent var		-0.012669
Adjusted R-squared	0.676820	S.D. dependent var		1.657106
S.E. of regression	0.942047	Akaike info criterion		2.934315
Sum squared resid	31.06081	Schwarz criterion		3.406693
Log-likelihood	-56.95640	Hannan-Quinn criteria.		3.112074
Durbin-Watson stat	1.859286			

Table 6 reports the results from the error correction model (ECM) regression. It highlights the ARDL short-run model results that indicate how changes in the determinants of FDI influence it in the short term. The model's short-term dynamics are illustrated by the coefficients of the differenced variables, reflecting the immediate impact of changes in the independent variables on the dependent variable (Bati, 2024).

The immediate impact of changes in inflation (D(INF)) is significantly positive (coefficient = 0.240865, p = 0.0018). This suggests that an increase in changes in inflation initially attracts FDI. Meanwhile, the lagged effects of changes in inflation, represented by D(INF(-1)) and D(INF(-2)), remain positive and significant, with coefficients of 0.216115 (p = 0.0018) and 0.165820 (p = 0.0103), respectively. This indicates a sustained short-run positive influence of inflation on FDI in Malaysia.

On the other hand, the direct impact of exchange rate fluctuations (D(EXR)) is negative and significant (coefficient = -1.884031, p = 0.0134), suggesting that in the short run, a depreciation in the exchange rate discourages FDI. Interestingly, the lagged exchange rate effects (D(EXR(-1)) and D(EXR (-3))) show varying impacts. The first lag (D(EXR(-1))) has a positive and significant effect (coefficient = 1.702545, p = 0.0272), while the third lag (D(EXR(-3))) has a strong negative effect (coefficient = -2.866231, p = 0.0003). This volatility suggests that exchange rate movements have complex and fluctuating impacts on FDI in the short run. Overall, this volatility might reflect investor sensitivity to currency fluctuations. The short-run effects of trade openness (D(TOP)) are largely insignificant, except for D(TOP(-2)), which has a positive and significant effect (coefficient = 0.038922, p = 0.0469). In the short run, increased trade openness can positively affect FDI, but the overall impact is not consistent across different time lags.

The error correction term (CointEq(-1))* is significant with a negative coefficient (-0.445575, p = 0.0009). This indicates that there is a long-run equilibrium relationship between FDI and its determinants. The speed of adjustment to equilibrium is relatively moderate, implying that deviations from the long-run path correct at a moderate pace. As the existence of a long-run relationship is confirmed, it implies that while short-term fluctuations can occur, FDI tends to move towards a long-term equilibrium influenced by the key determinants identified in the study.

F-Bounds Test and Long-Run Estimation

The ARDL F-Bounds Test is used to test for the existence of a long-term relationship between variables in a model. The F-Bounds Test is used in the ARDL model to determine whether a long-run equilibrium relationship exists between the dependent variable (in this case, FDI as a percentage of GDP) and the selected macroeconomic variables (GDP, inflation, exchange rate, and trade openness) using the Malaysian data.

Table 7: ARDL F-Bounds Test

Test Statistic	Value	*k*
F-Statistics Value	4.022739	4

Significance Level	I(0)	I(1)
10%	2.2	3.09
5%	2.56	3.49
2.5%	2.88	3.87
1%	3.29	4.37

Source: Authors' computation.

In Table 7, the calculated F-statistic (4.0227) is greater than the upper bound at the 5% significance level (3.49) and close to the 1% significance level upper bound (4.37). This result indicates that there is a statistically significant long-run equilibrium relationship between FDI (as a percentage of GDP) and the selected macroeconomic variables (GDP, inflation, exchange rate, and trade openness). This means that these variables collectively influence FDI in the long run. Once the F-Bounds test confirms that a long-run relationship exists, it implies that the selected macroeconomic variables, when considered together, have a meaningful impact on FDI over time.

Autoregressive Distributed Lag (ARDL) and Long-Run Estimation

In this section, the following Table 8 shows the estimated results for long-run coefficients from the ARDL model. The ARDL estimation provides specific coefficients for each macroeconomic variable, showing how each one impacts FDI in the long run.

Table 8: Estimated Long-Run Coefficient Results

Levels Equation Case 2: Restricted Constant and No Trend				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
GDP	0.211378	0.145669	1.451090	0.1571
INF	-0.184663	0.324299	-0.569422	0.5733
EXR	1.107145	1.044444	1.060033	0.2976
TOP	-0.011429	0.013484	-0.847609	0.4034
C	1.718010	3.504923	0.490171	0.6276
EC = FDI_OF_GDP - (0.2114*GDP -0.1847*INFLATION + 1.1071*EXCHANGE_RATE -0.0114*TRADE_OPENNESS + 1.7180)				

Source: Authors' computation.

The coefficient for GDP is 0.2114, indicating a positive relationship between GDP and FDI in the long run. However, the t-statistic (1.4511) is not significant (p-value = 0.1571). It suggests that the positive relationship between GDP and FDI might not be statistically significant in the context of this study. Meanwhile, the coefficient for inflation is -0.1847, indicating a negative relationship between inflation and FDI, which aligns with past literature. This suggests that higher inflation may lead to a reduction in FDI inflows in the long run. However, similar to GDP, the relationship is not statistically significant at a 5% level (t-statistic = -0.5694, p-value = 0.5733).

The exchange rate has a positive coefficient of 1.1071, suggesting that a higher exchange rate (likely indicating a depreciation of the local currency) is associated with increased FDI inflows. This relationship, however, is not statistically significant (t-statistic = 1.0600, p-value = 0.2976). In the case of trade openness, the coefficient of -0.0114, indicates a negative relationship between trade openness and FDI in the long run. This suggests that greater trade openness might lead to a slight decrease in FDI inflows, though this relationship is again not statistically significant (t-statistic = -0.8476, p-value = 0.4034) in this model.

The ARDL model results suggest that while there are positive and negative relationships between FDI and the selected macroeconomic variables (GDP, inflation, exchange rate, and trade openness), none of these relationships are statistically significant in the long run within the context of this model. The lack of statistical significance implies that these macroeconomic variables might not have a strong or direct long-term impact on

FDI inflows according to the model's estimation. However, these relationships could still be economically meaningful and warrant further investigation with different models or additional data.

Diagnostic Checks

In this study, two types of diagnostic tools are employed to test for serial correlation and heteroscedasticity in the regression model residuals. They include the Breusch-Godfrey Serial Correlation LM Test and the Breusch-Pagan-Godfrey Heteroscedasticity Test. In addition to that are the CUSUM stability tests being undertaken for this study.

Table 9: Diagnostic Test

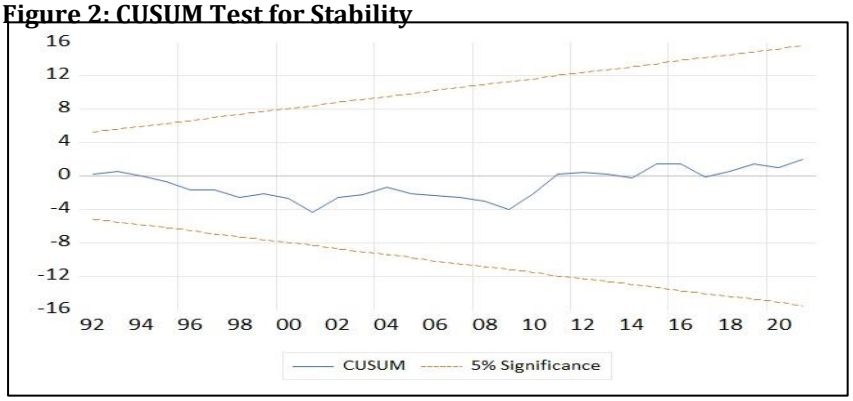
Items	Test Applied	F-Statistics	Probability
Serial correlation	Breusch-Godfrey Serial Correlation LM Test	1.853618	0.1693
Heteroscedasticity	Breusch-Pagan-Godfrey	0.190324	0.9423

Source: Authors' computation.

The Breusch-Godfrey Serial Correlation LM Test is a statistical method used to determine the presence of serial correlation in regression model residuals (Mignon, 2024). It is used when residuals from one period are correlated with those from another, violating the assumption of independence in error terms. The test results are interpreted as either a null hypothesis (H0) or an alternative hypothesis (H1). In this study, the null hypothesis is rejected due to a p-value of 0.1693 as depicted in Table 9, which exceeds the conventional significance level (0.05). This indicates that there is insufficient evidence to infer serial correlation in the residuals of the ARDL model. The summary of the test shows no evidence of serial correlation, indicating that the residuals are independent, consistent with the assumption of no serial correlation. Meanwhile, the Breusch-Pagan-Godfrey Heteroscedasticity Test is a diagnostic tool used to identify heteroscedasticity in regression model residuals (Mignon, 2024). This study failed to reject the null hypothesis (H0) due to a p-value of 0.9423, suggesting that the residuals are likely homoscedastic, meaning the variance of errors remains constant across observations. The Breusch-Pagan-Godfrey Heteroscedasticity Test did not reveal any evidence of heteroscedasticity in the residuals, confirming the reliability and robustness of the model's estimates and inferences.

Stability Test (CUSUM)

Figure 2: CUSUM Test for Stability

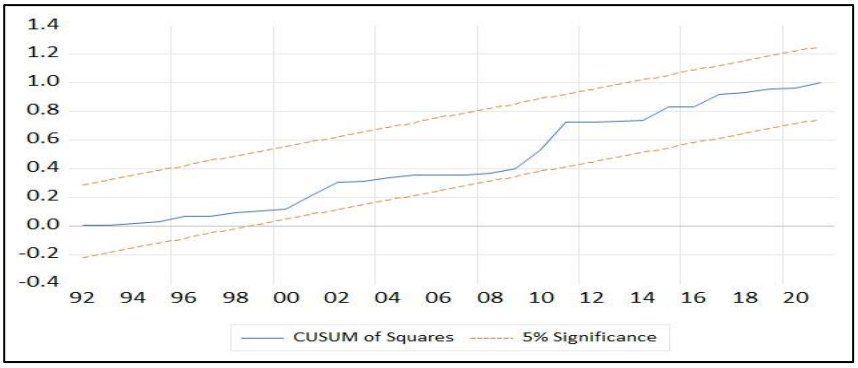


The Cumulative Sum (CUSUM) test is a stability test used in econometrics to determine the stability of regression model coefficients over time (Otto & Breitung, 2023). The test is based on the cumulative total of recursive residuals, and a stable model remains within a pair of crucial lines for analysis. The graph shows the blue line representing the cumulative sum of residuals, while red dashed lines represent the 5% significant limits. The critical values of the test are used to calculate these limits, which form a corridor for the CUSUM line to be located if the model is stable.

The graph in Figure 2 shows that the CUSUM line remains within the 5% significant boundaries during the entire sample period from 1992 to 2020. Although there are oscillations in the CUSUM line, none are significant enough to break through the significance boundaries. As a result, the model is considered stable, as the parameters remain stable over various periods.

Stability Test (CUSUM of Square)

Figure 3: CUSUM of Squares Test for Stability



The Cumulative Sum of Squares (CUSUM) test is a statistical method used to monitor a regression model's parameters over time to identify any structural changes or instability (Otto & Breitung, 2023). It uses time series analysis and econometrics to determine if the relationship between variables is consistent over the observed period. The test is displayed in a figure with significance thresholds for 5%, aiming to determine if the regression coefficients remain stable over time. The blue line in Figure 3 represents the cumulative total of squared residuals, while dashed red lines represent the bounds associated with the 5% significance level. The null hypothesis of parameter stability is accepted if the blue line remains within these boundaries throughout the experiment. From 1992 to 2020, the CUSUM of Squares line remains within the 5% significance boundaries, indicating that the regression model has remained consistent and that the model's parameters have not undergone significant structural changes.

5. Conclusion

The empirical findings from the ARDL model on the relationship between FDI and its selected macroeconomic determinants in Malaysia offer insightful conclusions about how various economic factors influence FDI as a percentage of GDP. It reveals both short-run and long-run dynamics, as analyzed through the ARDL model. In the short run, the ARDL model's results suggest that inflation, and exchange rates are important determinants of FDI in Malaysia. Trade openness, while theoretically important, does not show strong statistical significance in this empirical setup. The findings underline the importance of stable economic conditions, particularly controlled inflation and stable exchange rates, in attracting FDI into the Malaysian economy.

Meanwhile, the error correction model confirms the existence of a long-run relationship. It highlights that while short-term fluctuations can occur, FDI tends to move towards a long-term equilibrium influenced by the key determinants identified in the study. Additionally, the calculated F-statistic from the F-Bounds test results confirms that there is a stable, long-run relationship among these variables. The F-Bounds test results suggest that the selected macroeconomic variables are collectively cointegrated with FDI. This means that changes in GDP, inflation, exchange rate, and trade openness are likely to have a lasting impact collectively on FDI levels as indicated by the presence of cointegration in the model, despite its absence at the individual level. In particular, the long-run results for individual variables suggest that the determinants considered (GDP, inflation, exchange rate, and trade openness) do not have strong or significant effects on FDI.

Overall, the ARDL analysis in this study reveals a complex relationship between FDI and its determinants in Malaysia. These findings highlight the importance of managing short-term economic variables, particularly controlled inflation and stable exchange rates, to attract and maintain FDI inflows into Malaysia which is in line

with Chew (2024) where preserving macroeconomic stability is crucial. This information can be used by policymakers and researchers to make informed decisions and forecasts, as it is founded on the understanding that these variables are interconnected and maintain a stable long-run relationship, albeit collectively.

Future Research

The lack of evidence for individual variables' long-run relationship could imply that there are other factors not included in the model, such as political stability, regulatory environment, or external economic conditions, that may play more critical roles in shaping long-term FDI in Malaysia. This study suggests a need for further investigation into other long-term determinants. Such efforts will assist policymakers in deducing effective strategies to increase Malaysia's appeal to foreign investors in terms of FDI.

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The Dominance of TikTok in Shaping Online Purchasing Intention

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Abstract: In recent years, TikTok has emerged as a dominant force in the realm of social media, captivating millions worldwide with its short-form video content. This paper explores the significant influence of TikTok on consumers' online purchase intentions. Through an examination of relevant literature and empirical studies, the paper elucidates the mechanisms through which TikTok impacts consumer behavior and decision-making processes. It delves into the role of user-generated content, influencer marketing, and algorithmic recommendations in shaping consumer preferences and driving purchase intentions on the platform. Additionally, the paper discusses the unique features of TikTok, such as its immersive and engaging format, personalized content delivery, and seamless integration of e-commerce functionalities, which contribute to its efficacy as a persuasive tool for brands and marketers. Furthermore, the paper highlights the implications of TikTok's dominance for businesses seeking to leverage the platform for marketing purposes and outlines strategies for effectively harnessing its potential to enhance online sales and brand engagement. Overall, this paper sheds light on the transformative influence of TikTok in the digital landscape and underscores its pivotal role in shaping contemporary consumer behavior and purchase intentions.

Keywords: *TikTok*, *Online Purchase Intention, Perceived host interaction, Perceived convenience, Perceived Media Richness*

1. Introduction and Background

The shift in how consumers approach online purchases is indeed a fascinating subject, particularly when examining the role of emerging platforms like TikTok. The internet has drastically altered consumer behavior, making online shopping a standard practice. Social media, particularly platforms like TikTok, now plays a pivotal role in influencing purchasing decisions. TikTok's unique format—short, engaging videos often enhanced by trends and viral content—creates a compelling environment for driving consumer interest. This is especially relevant for students and younger demographics who are highly active on these platforms. TikTok's algorithm-driven content discovery and influencer-driven promotions can significantly impact purchase intentions by making products appear both desirable and accessible.

When studying this phenomenon, researchers like Rodrigues et al. (2021) focus on how TikTok's immersive and interactive nature, combined with its strong social influence dynamics, can shape online shopping behaviors. The platform's ability to generate viral trends and harness the power of influencer endorsements makes it a powerful tool for shaping consumer preferences and driving purchasing actions. For students and tech-savvy individuals, who are typically more engaged with social media, TikTok's influence is particularly pronounced. This demographic's interaction with the platform often results in high levels of engagement with sponsored content and trends, which can directly affect their purchase intentions.

Overall, the dominance of TikTok in shaping online purchasing intentions among students highlights the evolving landscape of digital marketing and consumer behavior. Understanding these dynamics can provide valuable insights for businesses looking to leverage social media to influence consumer decisions effectively.
In the modern business atmosphere, numerous factors can influence a consumer's online purchase choice. The shopping cart software is one of the elements. This is because shoppers in Malaysia now have access to a plethora of e-commerce platforms, such as Shopee, Lazada, Go Shop, and Mudah.my, each offering a unique set of features and prices for the products they desire. However, other social media platforms, such as Twitter, Instagram, and Facebook, enable consumers to make purchases online. Facebook, for example, has announced the launch of brand-new capabilities that will allow sellers to advertise and sell their goods on the platform (Nair, Ganatra, Kee, Heng, Mei & Huang, 2022), even though all of these platforms have added numerous new

features aimed at helping small and large businesses survive. Furthermore, it is indisputable that Lazada and Shopee are the preeminent e-commerce platforms in Malaysia (Vasudevan & Arokiasamy, 2021). Nevertheless, after the unprecedented COVID-19 pandemic that has engulfed the nation, TikTok, a video-creating application, has surged in prominence within the business sector (Nair et al., 2022). According to Shaun (2023) findings, the number of TikTok users in Malaysia is anticipated to increase by 52%, from 6,990,081 in 2022 to 10,643,189 in 2026.

TikTok is a cutting-edge social media application that primarily showcases concise video content. By utilizing various filters, effects, and renowned musical compositions, individuals can create videos ranging from 15 to 60 seconds. TikTok is an AI-driven amalgamation of Instagram, Facebook, and YouTube (Mhalla, Yun, & Nasiri, 2020). Furthermore, according to Changhan, Zhu, and Phongsatha (2021), the Chinese corporation ByteDance launched TikTok, a social media platform specializing in short musical videos, on September 20, 2016. It is a platform dedicated to short music videos specifically designed for teenagers. Users can select songs, pair them with brief movies, and create their compositions for short videos for all ages on this social platform. It is fair to argue that "TikTok algorithm" and "viral TikTok" are frequently used in society. Another significant factor contributing to this predicament is the platform's announcement about the debut of its e-commerce endeavor, TikTok Shop. Once recognized primarily as a social media site for brief videos, TikTok has altered users' perceptions by functioning as an e-commerce platform (Ooi, 2022).

By offering vendors the ability to create captivating and user-friendly movies to promote their products, the TikTok shop undoubtedly entices numerous consumers to make online purchases. This is because contemporary individuals are more inclined towards video-based advertising than reading, as this approach is perceived as more captivating and comprehensible. There are eight out of ten millennials believe that videos are highly advantageous when making online purchase decisions, and seven out of ten are inclined to watch videos during online shopping. Live streaming and video advertising represent a novel marketing phase in the business sector (Haenlein, Anadol, Farnsworth, Hugo, Hunichen & Welte, 2020). Consequently, TikTok is the preferred platform for people seeking to make online transactions. Numerous vendors also started transitioning and actively marketing their products through this program because it facilitated consumer acquisition, resulting in a surge in sales.

As a result, consumers now have a new opportunity to engage in the shopping process in a physical store by inspecting product channels, receiving immediate guidance, and testing products, all thanks to the emergence of a novel digital marketing strategy known as live streaming (Zhang et al., 2020). Live streaming enables the simultaneous transmission of visuals, sound, and motion to convey product information to consumers (Ahmadi & Hudrasyah, 2022). This allows consumers to obtain more precise product information, capturing their attention and enhancing their intention to purchase online. Several vital elements contribute significantly to TikTok's ability to attract and enhance online buying intentions among Malaysian consumers, particularly younger ones. The remarkable success of the TikTok platform has compelled its competitors to emulate its strategies to establish a stable presence in the market. Leiva Castillo et al., 2023 observed that rivals in social media recognized TikTok's widespread appeal and subsequently included comparable functionalities in their platforms. In November 2020, Snapchat launched a Spotlight feature similar to TikTok's "For You" page. Similarly, in August 2020, Instagram released Reels, a short video feature on its platform.

TikTok's dominance in the contemporary business sector remains unaffected by introducing this new feature. TikTok obtained over 176 million downloads in the third quarter of 2019 and ascended to the second most downloaded app on the Android store and the fifth most downloaded app on the Apple store globally, which explains why the majority of users continue to be devoted customers (Changhan et al., 2021). Furthermore, consumers in Malaysia have their online purchasing intentions enticed by the TikTok shop through the provision of discount vouchers and complimentary shipping. These incentives have emerged as popular consumer favorites. Students enrolled at Universiti Teknologi Mara (UITM) constituted the target population for this research, thereby influencing the online purchase intentions of consumers of varying ages and facilitating their exploration and comprehension of TikTok's dominance in the Malaysian business sector.

2. Literature Review

Perceived host interaction, a key aspect of TikTok marketing, involves the seller engaging with consumers through live TikTok sessions or providing product feedback (Liu, J., & Khong-khai, S.,2024). Studies have shown social presence and the perception of being together with others in a virtual environment which significantly enhances sustained engagement among students (Li et al., 2022b). Due to their ability to affect consumer behavior, emotions are vital in marketing and advertising. In response to outside stimuli, emotions are evoked. These emotions can be used to draw in customers, improve product recall, promote sharing, and eventually increase revenue. According to Song et al. (2021), emotional marketing tactics try to elicit particular feelings like fear, rage, grief, or happiness to get the intended reaction.

Interactivity, the degree to which consumers actively engage with content, is particularly high in live-streaming e-commerce. Live streaming e-commerce has a very high level of interaction, or how actively users interact with the content. According to Lu and Chen (2021), broadcasters must encourage audience participation during live sessions as live-streaming shopping has a direct impact on consumers' purchasing inclinations. Viewer involvement can be raised by introducing yourself, responding to questions and comments, and thanking them for their participation. Hosts can create a more participative and interesting live-streaming experience by interacting with their audience.

Perceived convenience: To understand why people may purchase online, it is important to comprehend the idea of perceived convenience (Li et al., 2021). Students no longer need to leave the TikTok platform to conduct buying and selling operations because of this ease. TikTok aims to make this application a hub for online shopping and entertainment. According to Vikas Gautam (2018), convenience refers to how quickly and easily buyers can access shops to purchase their desired products.

Consumers can visit the seller's profile directly and click on the "store" icon, which features an image of a handbag, to view every item that the seller has listed along with their prices. The consumer has the option to purchase the item and add it to their cart before completing payment. TikTok provides an experience for purchases that is comparable to other online marketplaces. Therefore, buying goods on TikTok Shop wouldn't be a problem for a consumer who has previously made purchases on websites like Shopee (Le-Hoang, 2020).

Online consumers can immediately and easily do online shopping that identifies their demands since they have access to convenient services and products over the Internet. Online purchasing offers a variety of benefits. Customers can find goods easily. You can also find the items you want to buy through the videos that appear on the "For Your Page" (FYP). Recently, TikTok created a function that offers a two-in-one buying experience. This eliminates the need for you to waste time looking for things on other platforms. Without leaving the app, you can purchase a range of suggested items through the TikTok Shop.

Nowadays, with all the advancements in technology and knowledge, it is simple to use the services that are offered. All formerly challenging personal and professional tasks can now be made easy in a variety of ways thanks to modern advancements. We can benefit from this technology to earn money from home.

Perceived Media Richness: refers to consumers' subjective opinions and impressions about the reasonableness, acceptability, and affordability of the price gap between the previous, competitor's, and seller's prices. Moreover, marketers should strive to promote and establish the concept of price equity for their product or service, as customers' inclination to make a purchase is enhanced when the price is deemed fair (Son & Jin, 2019). Furthermore, dynamic pricing was prevalent in the field of e-commerce, and it generated significant controversy due to consumer apprehensions around apparent disparities in prices.

The perception of pricing fairness is essential as it determines the value of a product. Equitable pricing enhances the product's worth. As both a student and a buyer, I have witnessed the prices of a product among different stores on an internet platform. TikTok has become the preferred platform for comparing goods prices. Customers' perception of unjustifiable pricing may result in dissatisfaction, decreased consumption, dissemination of negative feedback, or implementation of actions that negatively impact the sellers' reputation or their capacity to cultivate customer loyalty.

A business can expand its customer base and foster economic growth by providing equitable pricing to student consumers. Students experience satisfaction when they acquire a thing at a reasonable and equitable price. This has prompted consumers to make repeat orders and has increased their propensity to make online purchases. Hence, the students of the semester 5 Faculty of Business and Management at UITM Puncak Alam considered the fairness of the pricing to be crucial in determining their intention to make online purchases.

Based on the theory and previous studies, a few hypotheses have been formed for the factors that influence semester 5 UiTM students' online purchase intention. Three hypotheses statements have been shown below:
H1: A perceived host interaction positively influences the TikTok intention of students in the semester five faculty of Business and Management at the Universiti Teknologi Mara (UiTM), Puncak Alam.
H2: A perceived convenience positively influences the TikTok intention of students in the semester five faculty of Business and Management at the Universiti Teknologi Mara (UiTM), Puncak Alam.
H3: A perceived Media Richness positively influences the TikTok intention of students in semester five faculty of Business and Management at the Universiti Teknologi Mara (UiTM), Puncak Alam.

3. Research Methodology

This research aims to analyze the effect of online purchase intention among TikTok users who are students at Universiti Teknologi MARA. The considered population includes individuals who have used TikTok for shopping purposes. Specifically, the target population consists of Universiti Teknologi MARA students aged 20 years old and above, actively engaged with TikTok and exposed to TikTok marketing activities and content. The scope of the study includes the entire student population of Universiti Teknologi MARA, which totals 160 students across International Business courses. For this study, a simple random sampling method was used to obtain a balanced sample from the student body at Universiti Teknologi MARA. According to the guidelines outlined by Krejcie and Morgan (1970), the sample size determined for the entire population was 160 students.

For the survey, questionnaires are disseminated through Google Forms and WhatsApp. The questionnaire opted for online distribution due to its cost-effectiveness, speed in gathering responses, and lack of geographical constraints, a departure from traditional mail-in surveys. The online survey method, widely accepted by internet researchers, is anticipated to yield credible primary data on the subject of TikTok's influence on online purchasing intentions among 5th-semester students in the Faculty of Business and Management at UiTM Puncak Alam in which the outcome of the said data was tabulated for further interpretation. In terms of graphical representation, the SPSS software was used, as this software's function is to provide a statistical analysis of the data that has been tabulated.

4. Results

Demographic

In this study, the researcher categorizes demographic information into three distinct factors to consider: Age, Gender, and Class. The question is situated in Section A of the questionnaire. The results are presented in the following summary:

For the frequency and percentage of age among the respondents of the organization, there is a total of 160 respondents. The majority of respondents, comprising 102 individuals (63.7% of the total), were between the ages of 20 and 22. Additionally, 46 respondents (28.7%) fell within the age range of 23 to 25, while the remaining 12 respondents (7.5%) were 26 years old or older.

Next, the frequency and percentage of gender among the respondents of the organization. There is a total of 160 respondents. The respondents consist of 104 females and 56 males. The data shows that 65% of the respondents are female, while 35% are male.

For the frequency of the distribution of classes, the total number of respondents is 160. The majority of respondents were from class BA246 5B, which is 48 (30%) of the respondents; 35 (21.9%) of respondents were from class BA345 5E; 28 (17.5%) of the respondents were from class BA245 5A; 28 (17.5.5%) of the respondents were from class BA245 5D; and lastly, 21 (13.1%) of respondents are from class BA246 5C.

Reliability test

In researching the online purchase intentions of students in semester 5 at UiTM Puncak Alam, in the Faculty of Business and Management, there are six questions used for all dependent variables and independent variables. There are 160 respondents on each scale. Firstly, the result of Cronbach's Alpha for perceived media richness is 0.793. The Cronbach's Alpha result for the perceived host interaction is 0.794. Lastly, for the dependent variable, which is perceived convenience, Cronbach's alpha result is 0.794. We can conclude that all three independent variables and dependent variables are stable and have an excellent reliability level.

Normality test

Descriptive Statistics

PMR: The mean value is 4.101, with standard deviations of 0.628. The minimum values are all 1 except for PMR which is 1.58 the maximum values are all 5. PHI: The mean value is 4.134, with standard deviations between 0.612. The minimum value is 1 and the maximum values are all 5. PC: The mean value is 4.182, with standard deviations between 0.589. The minimum value is 1 and the maximum value is 5. DV: The mean value is 4.272, with standard deviations of 0.559. The minimum value is 1 and the maximum values are all 5.

The statistics also include skewness and kurtosis measures, which provide information about the shape of the distribution of the data. For example, a negative skewness value indicates that the data is skewed to the left, while a positive kurtosis value indicates that the data is peaked. Overall, the data in the table appears to be fairly consistent across the different variables, with means and standard deviations within a similar range. There is also no significant skew or kurtosis in the data.

Validity analysis: Validity indicates whether the concept is well-founded and corresponds accurately. Bougie, R., & Sekaran, U. (2019) identify three types of validity: content validity, criterion-related validity, and construct validity. In this study, content validity is being utilized. According to Bougie, R., & Sekaran, U. (2019), content validity ensures that the measure contains an adequate and representative set of items that capture the concept. Experts determined the validity of the instruments used in this study. The experts' feedback was used to validate the questionnaires before they were distributed to actual respondents.

Factor analysis: Factor analysis is a data reduction technique that is used to reduce a large number of variables to a smaller set of back factors that summarize the primary data contained in the variables. According to Coakes & Ong (2011), the sampling adequacy tests Bartlett and Kaiser-Meyer-Olkin (KMO) can be used to determine the factorability of the entire matrix, and if Bartlett's test of sphericity is high and significant and the KMO value is greater than 0.6, factor ability is assumed. SPSS's factor menu offers seven methods for factor extraction. Principal Components Analysis is used to test the factor analysis in this study.

Dependent Variable (DV)

Correlation Analysis of Dependent Variable

The result indicates that none of the variables exhibit a correlation coefficient below +/- 0.30, indicating a lack of low correlation. Therefore, it is necessary to retain all of the variables. Moreover, all correlation values are below 0.90. This suggests the absence of any issues related to multicollinearity.

KMO and Bartlett's Test (DV)

Kaiser (1974) recommends a minimum value of 0.5 for the Kaiser-Meyer-Olkin (KMO) statistic, which is considered barely acceptable. Values between 0.7 and 0.8 are considered acceptable, while values above 0.9 are considered superb. According to the findings, the KMO measure is 0.852, which exceeds the threshold of 0.5 and thus can be considered acceptable.

Subsequently, Bartlett's test was conducted. The results demonstrate an additional indication of the robustness of the relationship between the factors. Bartlett's test of sphericity yields a p-value of less than 0.001. The significance level is less than 0.05. Consequently, a correlation matrix is not equivalent to an identity matrix. The Bartlett test for sphericity is significant, and the Kaiser-Meyer-Olkin measure of sampling adequacy is considerably higher than 0.8.

Total Variance Explained by the Dependent Variable
The total variance presents the three potential factors. The cumulative value of 80.91% signifies that the initial factor explains more than half of the variability in the independent variables. Therefore, the question can be utilized.

Rotated Factor Matrix for Factor Analysis of Dependent Variable

a. 1 component was extracted
The purpose of the rotation is to decrease the dependence of the variables under consideration on a large number of factors. Rotation does not impact the investigation except for facilitating translation. Upon examining the result, it is evident that DV1, DV2, DV3, DV4, and DV5 exhibit significant loadings on Factor (Component) 2. This factor can serve as an independent variable for subsequent analysis. Varimax rotation is the most frequently used method of rotation, wherein the factor axes are maintained perpendicular to each other. Generally, rotation decreases the number of intricate variables. Nevertheless, the solution that has been rotated still includes multiple intricate variables. Factor 1 exhibits five-factor loadings, which vary between 0.199 and 0.647.

Independent Variable (IV)

Correlation Analysis of Independent Variable (IV)
The analysist indicates that all of the variables have correlation coefficients that are not considered low (r > +/- 0.30). Therefore, it is imperative that none of the variables are eliminated. Moreover, all correlation values are below 0.90. This suggests the absence of any issues related to multicollinearity.

KMO and Bartlett's Test (IV)
Kaiser (1974) recommends a minimum value of 0.5 for the Kaiser-Meyer-Olkin (KMO) measure, which is considered barely acceptable. Values between 0.7 and 0.8 are considered acceptable, while values above 0.9 are considered superb. The result indicates that the KMO measure is 0.741, surpassing the threshold of 0.5, which suggests that it is acceptable. Subsequently, Bartlett's test was conducted. The results demonstrate an additional indication of the robustness of the relationship between the factors. The critical value for Bartlett's test of sphericity is 0.001. The significance level is less than 0.05. Therefore, it can be inferred that the correlation matrix is not equivalent to an identity matrix. The Bartlett test for sphericity is significant, and the Kaiser-Meyer-Olkin measure of sampling adequacy is greater than 0.7.

Total Variance Explained of Independent Variables
This analysis presents data elucidating the salient factors. The total variance table presents the three potential factors. The combined percentages for Factors 1, 2, and 3 are 22.26%, 42.83%, and 62.49%, respectively. This suggests that the independent variables' corresponding factors account for more than half of their variation. Therefore, the question can be utilized.

Descriptive analysis

Descriptive Statistics for Variables
The descriptive statistic displays the mean and standard deviation of responses for interval-scaled variables. The results show that the overall mean for the variables on a five-point scale was average. Perceived convenience has the highest mean 4.18 and the lowest standard deviation 0.58927, while perceived media richness has the lowest mean 4.1014 and the highest standard deviation 0.62823. For perceived host interaction mean is 4.1344 and the standard deviation is 0.61187.

Correlation analysis
The correlation analysis shows a strong Pearson's correlation of r = 0.725 between perceived media richness and perceived convenience. The correlation coefficient (r) between perceived host interaction and perceived convenience is 0.669, indicating a strong positive relationship. The findings from Table 14 demonstrate a robust Pearson's correlation of r = 1 between perceived convenience and perceived host interaction. This suggests that there is a statistically significant correlation among all variables.

Multiple regression analysis: Multiple regression analysis utilizes multiple variables to elucidate the variation in the dependent variable (Bougie & Sekaran, 2019). The study employed multiple regression analysis to examine the impact of perceived convenience, perceived host interaction and perceived media richness on UiTM Puncak Alam Students' online purchase intention. According to Bougie, R., & Sekaran, U., (2019), the R-square quantifies the amount of variability in the dependent variable that the predictors can account for.

R-square Analysis

The result indicates that the coefficient of determination (R2) for this study is 0.435. This implies that the independent variables in this study—perceived convenience, perceived host interaction, and perceived media richness—can account for 43.5% of the variability in the dependent variable. Furthermore, according to the outcome produced by SPSS 25, the result demonstrates a significance level of .001. Therefore, this suggests that the collected data were reliable and can be deemed acceptable. The data's significance may be attributed to the extensive number of questions being tested for each variable.

Coefficient table

Coefficient table in the analysis reveals that only two independent variables, namely perceived host interaction and perceived convenience, made a substantial contribution to online purchase intention. Both variables exhibited significant values of <0.001. The standardized coefficients (beta) indicate that only 2 independent variables are significant which are perceived host interaction and perceived convenience. Standardized indicates perceived convenience has the greatest influence on the dependent variable (β .413, σ <.001) followed by perceived host interaction (β .397, σ <.001).

Discussion

Hypothesis 1

H1: A perceived Media Richness positively influences the TikTok intention of students in semester five faculty of Business and Management at the Universiti Teknologi Mara (UiTM), Puncak Alam.

According to the perceived media richness Spearman's Correlation Analysis, the factor's r-value is 0.823 and its p-value is 0.000. Since the results indicated a positive correlation between perceived price fairness and online purchase intention, the hypothesis can be accepted. It has been demonstrated that one of the factors affecting TikTok's dominance in online purchase intentions among UITM Puncak Alam students is perceived pricing fairness. The notion of pricing fairness for their product or service to their customers, particularly in purchasing intention to grow when the price is fair, is backed by (Son & Jin, 2019). Our analysis of the data leads us to the conclusion that, in comparison to other online platforms, TikTok is a preferred online purchasing destination for many young consumers, particularly UITM Puncak Alam students, because of its higher selling prices. TikTok store featuring a selection of brief content available on the well-known TikTok platform. Early reports from many other nations claim that sales through it are higher than those through other internet shopping platforms. Another way for customers to receive a lower price is to pay close attention to what is being shown live on the TikTok shop. Usually, these internet retailers will compare prices to provide you with the greatest deal. Some sellers also frequently launch flash bargains in a few minutes.

The researchers hypothesized that because TikTok shop transactions are more affordable than those made on other online shopping platforms, perceived pricing fairness influences UITM Puncak Alam students. It's critical to weigh your options and compare costs. As a result, when making an online purchase, customers can compare what they wish to buy by searching on the relevant sales platforms. When making purchases on TikTok, using past knowledge and expertise can frequently lead to lower prices for the product. This is because the top sellers on TikTok will be vying with each other to market their goods in an attempt to win over clients. Sales that are typically presented at the TikTok shop on the day of the festival or in the future are examples of advertising that are advertised. On the day of the festival or the relevant day, many items are usually provided at a lower price.

Hypothesis 2

H2: A perceived host interaction positively influences the TikTok intention of students in the semester five faculty of Business and Management at the Universiti Teknologi Mara (UiTM), Puncak Alam.

The findings indicate that among UiTM Puncak Alam students, there is a positive correlation between perceived host interaction which is (β .397, σ <.001) on the intention to make an online transaction. In cases where the significant result is less than 0.05, the hypothesis can be accepted. This is corroborated by (Liu, J., & Khong-khai, S.,2024). They mentioned that host engagement is one of the ideas where the seller interacts with the younger customer by providing comments on the products being offered or by doing a live TikTok stream about a product. We can infer from the results that users enjoy watching the host engage with viewers through the TikTok shop function. Therefore, the way hosts interact with young customers can increase their confidence in making purchases on TikTok by giving them information and showing the stuff to the audience.

Hypothesis 3

H3: A perceived convenience positively influences the TikTok intention of students in the semester five faculty of Business and Management at the Universiti Teknologi Mara (UiTM), Puncak Alam.

According to Ching, Hasan, and Abu Hasan (2021), an individual's intention to make an online purchase is mostly influenced by their perceived convenience, which can be broken down into three primary categories: time commitment, shopping location, and purchasing method. These factors have led to a greater inclination among most people to make purchases online rather than in person. As a result, there is a strong and positive correlation between the intention to make an online purchase and perceived convenience. In addition, the younger generation, which includes UiTM Puncak Alam students, will undoubtedly respond positively to this issue because they are renowned for appreciating convenient things and allowing them to save time and energy.

Furthermore, because students may continue to seek and evaluate desired goods and services from multiple brands and retailers to ensure that they only get the finest without having to travel, this perceived convenience also positively affects their intent to make online purchases. In summary, all information is easily accessible thanks to a platform design that is simple enough for people of all ages to use and comprehend. Standardized indicates that perceived convenience has the greatest influence on the dependent variable which is β .413, σ <.001.

5. Managerial Implications and Recommendations

This study will provide some information on the variables influencing UITM Puncak Alam students' propensity to make online purchases. The inclination to make an online purchase is positively influenced by numerous things. As consumers, students must consider and weigh a variety of aspects before making an online purchase. Thanks to the research findings, a large number of internet businesses will be able to evaluate their offerings to better meet the needs and desires of today's customers. As an illustration, during the pandemic, an excessive amount of transactions was made online, particularly on TikTok. Other than TikTok, a lot of businesses operate online today. Examples include Alibaba, Lazada, and Shopee. But what draws people to TikTok is that it follows market trends, which encourages students to use the app to make online purchases. In addition, businesses using social media or e-commerce platforms ought to focus more on these particular aspects.

Additionally, companies may use UITM Puncak Alam students as a target market for their improved strategies in locating and creating original ideas for social media platforms. The purpose of this study is to examine the factors influencing the intention of UITM Puncak Alam students to make online purchases. The study's theoretical conclusion is that after performing this analysis, a future researcher will have a solid comprehension of this subject. As there aren't many studies in Malaysia on this subject, the results of this study should encourage the next researcher to look into this matter. An entrepreneur might also use this research to examine their target market.

Conclusion

This study investigates the dominance of TikTok in online purchasing intention among semester 5 students at UiTM Puncak Alam. In this study, independent variables such as perceived host interaction, perceived

convenience, and perceived media richness were included to investigate the relationship between online purchasing intention and TikTok usage among UiTM Puncak Alam students. As mentioned in previous chapters, 161 respondents were selected from UiTM Puncak Alam to investigate the factors that influence online purchase intention among UiTM Puncak Alam students by distributing questionnaires via Google Forms. The respondents are semester 5 students enrolled in International Business courses.

Furthermore, consumer behavior theory was used in this study because it investigates how people make purchasing decisions. Consumer behavior theory allows businesses to better understand their target market and create products, services, and corporate cultures that influence consumer behavior. Furthermore, this theory aids in determining what drives these decisions and identifies methods for actively manipulating behavior.

In a nutshell, the two hypotheses were all found to be positively correlated at the end, and neither of them were refuted by the findings. Future researchers can contribute more information and findings to obtain more granular results. Future researchers can add additional information to produce more granular results. Additionally, this study provides recommendations and limitations for future research, which will be useful. The purpose of this research was to examine the significance of job factors, workload, and reward in influencing job stress. Results show that workload and job factors are major sources of job stress. While foreign superiors must find ways to impose numerous restrictions to improve a person's life, it is crucial to execute any type of improvement healthily so that foreign employees can improve their work style and attitude to doing their tasks. The main factor is for all parties to tackle this matter holistically to fulfill employee expectations while guaranteeing that the company requirements are addressed in this difficult business environment.

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Technological Innovation for Sustainable Supply Chain Management in the Food Industry

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Abstract: This study explores the critical role of technological innovations—specifically blockchain, Internet of Things (IoT), and artificial intelligence (AI)—in enhancing sustainable supply chain management within Malaysia's food industry. As the industry faces increasing pressure to adopt sustainable practices due to environmental concerns, regulatory demands, and consumer expectations, these technologies offer significant potential for improving traceability, reducing waste, and optimizing operational efficiency. The research highlights how blockchain enhances transparency and ethical sourcing, IoT enables real-time monitoring to minimize waste, and AI optimizes demand forecasting and inventory management, reducing overproduction and resource waste. However, the study also identifies substantial barriers to the adoption of these technologies, particularly for small and medium-sized enterprises (SMEs). These challenges include high implementation costs, a shortage of skilled labor, and concerns over data security and privacy. To address these issues, the study recommends starting with pilot projects to mitigate risks, investing in continuous workforce training, enhancing data security measures, and leveraging government support and industry collaborations. By overcoming these challenges, Malaysia's food industry can effectively integrate these innovations, leading to more sustainable, efficient, and resilient supply chains. This research underscores the importance of strategic planning and continuous improvement in fully realizing the benefits of technological advancements, thereby positioning Malaysia's food industry as a leader in sustainable practices within the global market.

Keywords: *Sustainable Supply Chain, Technological Innovation, Food Industry, SMEs*

1. Introduction

The food industry is a critical component of Malaysia's economy, contributing significantly to its GDP and employment. However, the industry faces increasing challenges due to rising consumer demand for sustainably produced food, stricter environmental regulations, and the global need to reduce carbon footprints across all sectors. As the global population continues to grow, the demand for food is expected to rise by 70% by 2050, putting immense pressure on food supply chains to become more efficient, transparent, and sustainable (Food and Agriculture Organization, 2018).

Sustainability in the food supply chain is not just a regulatory or consumer-driven requirement but a strategic imperative (Narayanan et al., 2024a; Narayanan et al., 2024b). Companies that adopt sustainable practices can reduce waste, improve resource efficiency, and enhance their brand reputation, leading to better financial performance and long-term resilience (Christopher & Peck, 2004). In Malaysia, the food supply chain faces unique challenges, including food waste, inefficient resource management, and the environmental impact of agricultural practices. Addressing these issues requires a shift towards sustainable supply chain management (SSCM) practices that integrate environmental, economic, and social goals (Seuring & Müller, 2008).

Technological innovation plays a pivotal role in this transition towards sustainability (Atikah et al., 2024). Technologies such as blockchain, the Internet of Things (IoT), and artificial intelligence (AI) offer new opportunities to enhance the sustainability of food supply chains. Blockchain technology, for example, can provide greater transparency and traceability, helping to ensure that food products are sourced sustainably and that their journey from farm to table is fully documented (Kamilaris et al., 2019). IoT devices enable real-time monitoring of supply chain activities, allowing for more efficient resource use and better management of food safety risks (Verdouw et al., 2016). AI can optimize various aspects of the supply chain, from demand forecasting to inventory management, reducing waste and improving overall efficiency (Choi et al., 2018).

Despite the potential benefits, the adoption of these technologies in Malaysia's food supply chain has been slow. Factors such as high implementation costs, lack of technical expertise, and concerns about data security and privacy pose significant barriers (Kamble et al., 2020). Moreover, small and medium-sized enterprises (SMEs), which make up a large portion of Malaysia's food industry, often lack the resources needed to invest in and implement these advanced technologies (Wamba & Akter, 2019).

This paper seeks to explore the role of technological innovations in fostering a sustainable supply chain within Malaysia's food industry. It aims to provide a comprehensive analysis of the current state of technology adoption, the challenges faced by industry players, and the potential benefits of integrating these technologies into their operations. Through a qualitative analysis involving key stakeholders in the food industry, this study will offer insights into the best practices and strategies for leveraging technological innovations to achieve sustainability goals in Malaysia's food supply chain.

2. Literature Review

The Importance of Sustainable Supply Chain Management (SSCM) in the Food Industry

The concept of Sustainable Supply Chain Management (SSCM) has become increasingly critical in the food industry, where sustainability challenges are both environmental and socio-economic (Mkumbo et al., 2019; Othman et al., 2023; Selvaraju et al., 2017). SSCM involves managing the flow of goods and services, including all processes that transform raw materials into final products, in a manner that minimizes negative environmental impacts, maximizes social welfare, and maintains economic viability (Ahi & Searcy, 2013; Sivan et al., 2024a; Sivan et al., 2024b). In the food industry, SSCM practices address issues such as food waste, resource efficiency, and ethical sourcing, which are essential to meeting global sustainability goals (Touboulic & Walker, 2015).

Malaysia's food industry is heavily reliant on agriculture, which has a significant environmental footprint due to factors like deforestation, water usage, and greenhouse gas emissions. The need for sustainable practices in this sector is driven by both international pressures to comply with sustainability standards and local imperatives to ensure food security and environmental conservation (Lim, 2020). Effective SSCM in the food industry can lead to reductions in waste, improvements in resource efficiency, and enhanced corporate social responsibility (Grimm et al., 2014).

Technological Innovations in Supply Chain Management

The advent of Industry 4.0 technologies has brought about transformative changes in supply chain management, offering new tools for improving sustainability. These technologies include blockchain, the Internet of Things (IoT), artificial intelligence (AI), and big data analytics, all of which can be leveraged to enhance transparency, efficiency, and sustainability in supply chains (Hofmann & Rüsch, 2017).

Blockchain technology is particularly relevant for the food industry as it provides a secure and transparent method for tracking the origin and journey of food products throughout the supply chain. This capability is crucial for ensuring food safety, preventing fraud, and promoting sustainable sourcing practices (Tian, 2016). For example, blockchain can verify that agricultural products are produced according to sustainable practices, ensuring compliance with certifications like Fair Trade or organic labels (Caro et al., 2018).

IoT devices play a significant role in real-time monitoring of supply chain operations. In the context of the food industry, IoT sensors can monitor various parameters such as temperature, humidity, and location during the transportation and storage of food products. This data ensures that food is handled correctly throughout the supply chain, reducing waste due to spoilage and improving overall supply chain efficiency (García et al., 2020).

Artificial Intelligence (AI) and **big data analytics** enable more accurate demand forecasting, inventory management, and decision-making processes. In the food industry, AI can analyze vast amounts of data from various sources, such as weather patterns, market trends, and consumer behavior, to optimize supply chain operations (Margherita et al., 2020). This optimization can lead to reduced waste, better resource utilization, and improved sustainability outcomes (Soni et al., 2020).

Challenges in Adopting Technological Innovations in Malaysia's Food Industry

While the potential benefits of these technologies are clear, their adoption in Malaysia's food industry is fraught with challenges. One significant barrier is the high cost of implementation. Many of the advanced technologies, such as blockchain and AI, require substantial initial investments in infrastructure, software, and expertise (Kamble et al., 2021). For many small and medium-sized enterprises (SMEs) that dominate Malaysia's food industry, these costs can be prohibitive (Chege et al., 2020).

Another challenge is the lack of technical expertise and skilled labor to implement and manage these technologies effectively. The successful integration of IoT, AI, and blockchain requires a workforce with specialized skills in data science, software development, and supply chain management (Raguseo, 2018). However, there is a notable skills gap in Malaysia's labor market, particularly in these high-tech areas, which hinders the widespread adoption of these innovations (Hashim et al., 2018).

Additionally, concerns about data security and privacy also pose significant challenges. The use of blockchain and IoT devices involves the collection and storage of vast amounts of data, which raises issues related to data ownership, security breaches, and compliance with data protection regulations (Casino et al., 2019). These concerns can be particularly acute in the food industry, where sensitive data about supply chain practices and product provenance must be protected.

Despite these challenges, the Malaysian government has recognized the importance of technological innovation for the sustainability of the food industry and has initiated various policies and programs to encourage the adoption of Industry 4.0 technologies. For instance, the National Policy on Industry 4.0, known as Industry4WRD, aims to transform Malaysia's manufacturing sector, including the food industry, by promoting the adoption of advanced technologies (Ministry of International Trade and Industry Malaysia, 2018).

Technological Innovations for Enhancing Sustainability in the Food Supply Chain

The integration of technological innovations in Malaysia's food supply chain holds significant promise for enhancing sustainability. Blockchain technology can improve transparency and traceability, helping to reduce food fraud and ensure that products are sustainably sourced (Pearson et al., 2019). The immutable nature of blockchain records ensures that every transaction is recorded and verified, providing a reliable way to track the environmental impact of food production and distribution (Francisco & Swanson, 2018).

IoT devices contribute to sustainability by enabling real-time monitoring of environmental conditions throughout the supply chain. This capability helps in maintaining the quality and safety of food products while reducing energy consumption and minimizing waste (Boursianis et al., 2020). For example, IoT sensors can alert supply chain managers to deviations in temperature or humidity that could spoil perishable goods, allowing for corrective actions to be taken promptly.

AI and big data analytics further enhance sustainability by optimizing supply chain processes. AI can be used to predict demand more accurately, reducing overproduction and minimizing waste. Big data analytics provides insights into consumer behavior, enabling companies to adjust their supply chains to better meet demand while reducing excess inventory and associated waste (Wamba et al., 2020).

Future Directions and Research Opportunities

The future of sustainable supply chain management in Malaysia's food industry will likely be shaped by continued technological advancements and increased collaboration among stakeholders. Future research should focus on developing cost-effective solutions that make these technologies accessible to SMEs, which are crucial to the food industry in Malaysia (Vatumalae et al., 2020). Additionally, there is a need for more empirical studies on the impact of these technologies on sustainability outcomes in the Malaysian context, as most current research is based on case studies from other countries (Brandenburg et al., 2014). Another important area for future research is the exploration of hybrid approaches that combine multiple technologies, such as blockchain and IoT, to create more robust and integrated supply chain solutions. These hybrid systems could address some of the limitations of individual technologies and offer more comprehensive solutions for managing the complexities of the food supply chain (Kim & Laskowski, 2018). In conclusion, while the adoption of technological innovations in Malaysia's food supply chain presents several challenges, the potential benefits

for sustainability are significant (Sundram et al., 2016; Vatumalae et al., 2022). By addressing the barriers to adoption and leveraging the capabilities of these advanced technologies, Malaysia's food industry can achieve greater sustainability, contributing to both national and global environmental goals.

3. Research Methodology

Conceptual Framework

The conceptual framework for this study is grounded in the intersection of technological innovation and sustainable supply chain management within the food industry in Malaysia. The framework posits that the integration of advanced technologies such as blockchain, IoT, and AI can significantly enhance the sustainability of the food supply chain by improving transparency, efficiency, and resource management. This framework draws on existing literature that highlights the transformative potential of these technologies in addressing key sustainability challenges, such as waste reduction, traceability, and resource optimization (Margherita & Heikkilä, 2020; Kamilaris et al., 2019). The framework also considers the specific challenges and barriers to technology adoption within Malaysia's food industry, such as high implementation costs, lack of technical expertise, and data security concerns (Chege et al., 2020; Kamble et al., 2021). By addressing these challenges, the study aims to explore how technological innovations can be effectively leveraged to promote sustainability in the supply chain, contributing to both environmental goals and business performance.

Sampling

This study employs a purposive sampling strategy to select participants who are knowledgeable and experienced in supply chain management and the implementation of technological innovations within the food industry. The sample includes key stakeholders across various sectors of the food supply chain in Malaysia, including:

Supply Chain Managers: Individuals responsible for overseeing and optimizing supply chain operations in food manufacturing and distribution companies.

Technology Vendors: Representatives from companies that provide technological solutions (e.g., blockchain, IoT, AI) for supply chain management.

Industry Experts and Consultants: Professionals with expertise in sustainable supply chain management and the implementation of advanced technologies.

A total of 10 participants were selected to ensure a diverse representation of perspectives and experiences. The participants were chosen based on their roles, experience in supply chain management, and involvement in technology adoption within the food industry.

Data Collection

Data for this study was collected through semi-structured interviews, allowing for an in-depth exploration of participants' insights, experiences, and perspectives on the adoption of technological innovations in the food supply chain. The interview questions were designed to address the key research objectives, focusing on the following areas:

Technology Adoption: Understanding the extent to which blockchain, IoT, and AI have been integrated into the food supply chain in Malaysia, including the specific technologies used and the processes involved.

Challenges and Barriers: Identifying the main challenges faced by participants in implementing these technologies, such as cost, technical expertise, and data security.

Sustainability Outcomes: Exploring the perceived impact of technological innovations on sustainability outcomes, including waste reduction, resource efficiency, and traceability.

The interviews were conducted either in person or via video conferencing, depending on the participants' availability. Each interview lasted approximately 60 minutes, and with the participants' consent, all interviews were audio-recorded and transcribed for accuracy.

Interview Questions: The interview questions are structured to cover three main areas: technology adoption and implementation, challenges and barriers, and sustainability outcomes. Each section is designed to elicit detailed responses that provide a comprehensive understanding of how technological innovations are influencing sustainable supply chain management in the food industry, as per following:

Technology Adoption and Implementation
Q1: How has your organization used technologies like blockchain, IoT, or AI in your supply chain?
Q2: Which technology has been the most helpful in making your supply chain more sustainable?
Q3: What steps did your organization take to start using these technologies?

Challenges and Barriers
Q4: What difficulties did your organization face when adopting these technologies?
Q5: How does your organization handle data security and privacy when using these technologies?
Q6: Have you had trouble finding skilled workers to manage these technologies?

Sustainability Outcomes
Q7: How have these technologies helped make your supply chain more sustainable?
Q8: Can you give an example of a time when technology led to significant sustainability improvements?
Q9: How do you measure the success of these technologies in improving sustainability?
Q10: What are your plans for using more technology in the future?

By employing this qualitative methodology, the study aims to gain rich (Sivan, Anuar, Krishnasamy, Bahrin, Narayanan, & Sundram, 2024b), in-depth insights into the role of AI in supply chain risk management, the challenges faced by practitioners, and potential solutions for overcoming these challenges.

4. Data Analysis

Table 1 provides an overview of the respondents who participated in the study on technological innovation in sustainable supply chain management within Malaysia's food industry. It captures key information about each respondent's role, the industry they represent, and their experience in both supply chain management and technology implementation.

Table 1: Respondent Demographics

Respondent's ID	Role	Industry	Years of Experience in Supply Chain	Years of Experience in Technology Implementation
1	Supply Chain Manager	Food Manufacturing	15	5
2	Technology Vendor	Technology Solution l	10	8
3	Industry Expert	Consultancy	20	12
4	Supply Chain Manager	Food Distribution	12	4
5	Technology Vendor	IoT Solution	18	10
6	Industry Expert	Sustainable Supply Chain	25	15
7	Supply Chain Manager	Agriculture	8	3
8	Technology Vendor	Blockchain Solution	14	7
9	Industry Expert	Food Safety	22	10
10	Supply Chain Manager	Retail Food Chain	10	6

Table 2 also provides a snapshot of the respondents involved in the study, representing various roles such as Supply Chain Managers, Technology Vendors, and Industry Experts from diverse sectors within Malaysia's food

industry, including Food Manufacturing, Distribution, Agriculture, and Retail. The respondents have a wide range of experience, with years in supply chain management ranging from 8 to 25 years and technology implementation experience spanning 3 to 15 years. This diversity in roles and experience levels offers a comprehensive view of how technological innovations are being adopted at different stages across the industry, providing valuable insights into the challenges and opportunities related to enhancing sustainability in Malaysia's food supply chain.

The thematic analysis in Table 2 organizes the responses from the interviews into key themes, providing a structured understanding of how technological innovations like blockchain, IoT, and AI are being integrated into Malaysia's food supply chain. The themes highlight the various strategies organizations use to adopt these technologies, the specific benefits they offer in terms of sustainability, and the challenges faced, such as high costs, skills gaps, and data security concerns. The table also captures the real-world impact of these technologies, with examples of how they have led to significant improvements in waste reduction, efficiency, and traceability within the supply chain. It also outlines how organizations measure the success of these innovations through KPIs and environmental impact assessments, offering insights into the tangible benefits of technology adoption. Finally, the table reflects broader perceptions of technology's role in transforming Malaysia's food industry towards greater sustainability, along with recommendations for other organizations considering similar technological adoption. This analysis provides a comprehensive overview of the current state of technological innovation in the industry and the potential for future advancements.

Table 2: Data Analysis -Thematic Analysis

Interview Question	Codes	Themes	Key Insight / Comment
Q1: How has your organization used technologies like blockchain, IoT, or AI?	Blockchain Integration (R1, R4, R7)	Technology Integration Strategies	"Blockchain has improved traceability, especially in high-value products." (R1)
	IoT Monitoring (R3, R6)		"IoT sensors have reduced waste by monitoring real-time storage conditions." (R3)
	AI Adoption (R2, R5, R10)		"AI-driven demand forecasting has cut down on overproduction." (R10)
Q2: Which technology has been the most helpful in making your supply chain more sustainable?	Blockchain for Traceability (R1, R8)	Key Technology for Sustainability	"Blockchain's transparency helps ensure sustainable sourcing." (R8)
	IoT for Real-time Data (R3, R6)		"Real-time data from IoT devices allows us to react quickly to supply chain issues." (R6)
	AI for Forecasting (R2, R9)		"AI's predictive capabilities have optimized our inventory management." (R9)
	Pilot Testing (R4, R6)		"Pilot testing was crucial to minimize risks before full-scale deployment." (R4)
Q3: What steps did your organization take to start using these technologies?	Gradual Rollout (R2, R9)	Implementation Process	"We implemented the technology in phases to ensure smooth integration." (R9)
	Staff Training (R5, R10)		"Ongoing staff training was essential for successful technology adoption." (R10)
Q4: What difficulties did your organization face when adopting these technologies?	High Costs (R1, R5, R9)	Challenges in Technology Adoption	"The initial investment was substantial, especially for SMEs." (R5)
	Lack of Expertise (R4, R7)		"Finding skilled personnel for AI implementation was challenging." (R7)
	Data Security Concerns (R8, R10)		"Data privacy issues are a major concern with blockchain adoption." (R10)

	Encryption (R3, R8)		"We use advanced encryption to protect data across the blockchain." (R8)
Q5: How does your organization handle data security and privacy when using these technologies?	Data Governance (R5, R6)	Data Security and Privacy Management	"Strict data governance policies are in place to ensure compliance." (R5)
	Compliance with Regulations (R2, R9)		"We adhere to global standards to ensure data privacy." (R9)
	Skills Gap (R1, R7)		"The skills gap is significant, requiring extensive internal training." (R1)
Q6: Have you had trouble finding skilled workers to manage these technologies?	Training Needs (R4, R9)	Workforce Challenges	"Continuous training programs are needed to keep up with technological advancements." (R9)
	Recruitment Challenges (R6, R10)		"Recruiting qualified staff has been difficult due to high demand for tech skills." (R6)
	Reduced Waste (R2, R4)		"AI and IoT have reduced waste significantly by optimizing resource use." (R4)
Q7: How have these technologies helped make your supply chain more sustainable?	Improved Efficiency (R3, R10)	Sustainability Outcomes	"Efficiency has improved dramatically, leading to lower costs and environmental impact." R10)
	Enhanced Traceability (R6, R8)		"Blockchain ensures that every step of our supply chain is traceable." (R8)
Q8: Can you give an example of a time when technology led to significant sustainability improvements?	Specific Case Studies (R1, R4)	Real-world Impact of Technology	"A specific blockchain implementation reduced our supply chain fraud incidents by 30%." (R1)
	Success Stories (R7, R9)		"IoT sensors helped us cut spoilage in half during the last quarter." (R9)
	KPIs (R5, R6)		"KPIs such as carbon footprint reduction and waste minimization are closely monitored." (R6)
Q9: How do you measure the success of these technologies in improving sustainability?	Metrics (R3, R10)	Measuring Success and Impact	"We use metrics like energy consumption and efficiency gains to measure impact." (R10)
	Environmental Impact Assessments (R2, R8)		"Regular environmental impact assessments help us track our sustainability progress." (R2)
Q10: What are your plans for using more technology in the future?	Future Integration Plans (R1, R9)	Future Technology Strategies	"We plan to expand our AI capabilities to cover more supply chain processes." (R1)
	Scaling Technologies (R4, R8, R10)		"Scaling up blockchain technology across all product lines is our next step." (R8)
Q11: What do you think about the role of technology in making Malaysia's food industry more sustainable?	Technology as a Catalyst (R2, R3, R	Perceptions of Technological Impact	"Technology is key to transforming Malaysia's food industry towards sustainability." (R5)
	Industry Transformation (R7, R8)		"The industry is in the midst of a technological revolution that will redefine sustainability." R8)
Q12: What advice would you give to other organizations that want to adopt these technologies?	Best Practices (R1, R6)	Recommendations for Adoption	"Start small, pilot new technologies, and scale as you see positive results." (R6)
	Lessons Learned (R4, R9)		"Continuous learning and adaptation are critical for success." (R9)

Discussion

This study explored the role of technological innovations in enhancing sustainable supply chain management within Malaysia's food industry, focusing on the adoption of blockchain, IoT, and AI technologies. The findings reveal significant insights into how these technologies are being implemented, the challenges encountered, and the tangible benefits they bring to sustainability efforts.

Technology Integration Strategies and Their Impact

The integration of blockchain, IoT, and AI into the food supply chain has been embraced by various organizations, as evidenced by the responses from the study participants. Blockchain technology, particularly, has proven to be a powerful tool for enhancing traceability and transparency, which are critical components of sustainable supply chain management. Respondents noted that blockchain's ability to provide an immutable record of transactions has significantly reduced fraud and ensured the ethical sourcing of products, aligning with global sustainability standards. IoT technology, with its real-time monitoring capabilities, has allowed organizations to reduce waste and improve efficiency by closely managing storage conditions and responding swiftly to potential issues. AI, particularly in demand forecasting and inventory management, has optimized operations, minimizing overproduction and resource waste. These technologies, therefore, are not just supplementary tools but are becoming central to achieving sustainability goals in the food supply chain.

Challenges in Technology Adoption

Despite the clear benefits, the adoption of these technologies is not without its challenges. High implementation costs emerged as a significant barrier, particularly for small and medium-sized enterprises (SMEs) that dominate Malaysia's food industry. The initial investment required for blockchain, IoT, and AI infrastructure, coupled with the ongoing costs of maintaining these systems, poses a substantial challenge. Additionally, the lack of skilled labor to manage and operate these advanced technologies was highlighted by several respondents. This skills gap necessitates continuous training and upskilling programs, which add to the overall cost and complexity of technology adoption (Sundram, Ghapar, Osman, Chew, & Muhammad 2023). Data security and privacy concerns also pose significant challenges, especially in the context of blockchain and IoT. Organizations are required to navigate complex regulatory environments to ensure compliance, which can be resource-intensive. The need for robust data governance frameworks and advanced encryption techniques further complicates the adoption process, making it difficult for organizations to fully leverage the potential of these technologies without exposing themselves to risks (Sundram, Rajagopal, Nur Atiqah, Atikah & Appasamy, Zarina, 2018).

Sustainability Outcomes and Measuring Impact

The study reveals that, where successfully implemented, these technologies have had a substantial positive impact on sustainability outcomes (Sundram, Rajagopal, Atikah & Subramaniam, 2018). Blockchain's ability to ensure traceability has not only enhanced transparency but has also built consumer trust, which is increasingly important in a market where sustainability is a key concern. IoT's role in real-time monitoring has significantly reduced waste, particularly in perishable goods, by preventing spoilage and ensuring optimal storage conditions. AI has improved operational efficiency, leading to both cost savings and reduced environmental impact. Organizations have developed various methods to measure the success of these technologies in achieving sustainability goals. Key Performance Indicators (KPIs) such as carbon footprint reduction, waste minimization, and energy efficiency are closely monitored. Environmental impact assessments are also regularly conducted to ensure that the sustainability objectives are being met. These measures provide tangible evidence of the benefits of technology adoption, further justifying the investments made.

Future Prospects and Recommendations

Looking forward, the study participants expressed plans to further integrate and scale these technologies across their supply chains. The potential for expanding AI applications and scaling blockchain to cover more aspects of the supply chain is particularly promising. However, the successful expansion of these technologies will depend on overcoming the identified challenges, particularly those related to cost and skills. For organizations considering the adoption of these technologies, the study offers several recommendations. Starting with pilot projects and gradually scaling up as positive results are achieved can help manage costs and reduce risks. Investing in ongoing training and development is crucial to address the skills gap. Additionally, organizations should prioritize data governance and security from the outset to protect against potential risks

(Sundram, Ghapar, Chew & Muhammad, 2023).

Implications for Malaysia's Food Industry

The findings from this study suggest that technological innovations hold the key to transforming Malaysia's food industry towards greater sustainability. As the industry faces increasing pressure from both consumers and regulators to adopt sustainable practices, the successful integration of blockchain, IoT, and AI will be critical. However, to fully realize the potential of these technologies, both the industry and the government will need to address the existing barriers, particularly those related to cost, skills, and data security.

In conclusion, while challenges remain, the benefits of adopting these technologies far outweigh the difficulties. With the right strategies and support, Malaysia's food industry is well-positioned to lead in sustainable supply chain management, setting a benchmark for other industries in the region.

5. Conclusion and Recommendations

This study underscores the transformative potential of technological innovations such as blockchain, the Internet of Things (IoT), and artificial intelligence (AI) in driving sustainability within Malaysia's food supply chain. These technologies have demonstrated substantial benefits, including enhanced traceability, reduced waste, and improved operational efficiency, which are crucial for meeting the growing demands for sustainable practices in the food industry. However, despite these clear advantages, the adoption of these technologies faces significant challenges, particularly for small and medium-sized enterprises (SMEs). High implementation costs, a shortage of skilled labor, and concerns about data security and privacy are major barriers that need to be addressed. Overcoming these challenges is essential for fully realizing the benefits of technological advancements in creating a more sustainable, efficient, and resilient food supply chain in Malaysia.

To mitigate the risks associated with high implementation costs and technical complexities, it is recommended that companies, especially SMEs, start with pilot projects. These smaller-scale implementations can help organizations understand the practical implications of new technologies, identify potential challenges early, and refine their strategies before full-scale deployment. Successful pilot projects can serve as proof of concept, easing the transition to broader adoption. Additionally, the shortage of skilled labor is a significant barrier to the successful adoption of advanced technologies like blockchain, IoT, and AI. Companies should invest in continuous training and development programs to equip their workforce with the necessary skills. Collaboration with educational institutions and industry experts to develop specialized training programs can help bridge the skills gap. Government-supported initiatives to enhance digital literacy and technical expertise across the industry will be critical.

Given the sensitivity of data handled by technologies such as blockchain and IoT, robust data security measures must be a priority. Organizations should implement advanced encryption techniques and establish comprehensive data governance frameworks to protect against breaches and ensure compliance with regulatory standards. This is particularly important in maintaining consumer trust and ensuring that the benefits of these technologies are not undermined by potential security risks. Moreover, the Malaysian government has already recognized the importance of Industry 4.0 technologies, as evidenced by the Industry4WRD policy. To accelerate the adoption of these technologies within the food industry, there is a need for more targeted support, particularly for SMEs. This could include subsidies for technology adoption, tax incentives, and grants for research and development. Additionally, the development of clear regulatory frameworks around the use of these technologies, particularly concerning data privacy and security, will be crucial in providing a stable environment for innovation.

Collaboration between different stakeholders in the food industry, including technology vendors, supply chain managers, and government bodies, can significantly enhance the effectiveness of technology adoption. Establishing industry consortia or partnerships can help share the costs and risks associated with implementing new technologies, provide platforms for knowledge sharing, and foster innovation through collective problem-solving. Such collaborations can also facilitate the standardization of practices, which is essential for the scalability of technological solutions across the industry. As companies move from pilot projects to full-scale implementation, scalability should be a key consideration. Long-term strategic planning

should focus on how these technologies can be integrated across the entire supply chain, from farm to table, to maximize their impact. This involves not only technological investments but also a shift in organizational culture to embrace continuous improvement and innovation. By planning for scalability, companies can ensure that the benefits of these technologies are fully realized over the long term.

In conclusion, the integration of blockchain, IoT, and AI within Malaysia's food supply chain presents a significant opportunity to enhance sustainability and competitiveness in the global market. While challenges remain, the potential benefits far outweigh the difficulties, particularly with the right strategies and support in place. By adopting a phased approach, investing in skill development, ensuring robust data security, and leveraging government and industry support, Malaysia's food industry can lead the way in sustainable supply chain management. These efforts will not only contribute to environmental conservation and social responsibility but also position Malaysia's food sector as a leader in innovation and sustainability in the global arena.

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Factors that Influence Customer Loyalty in Online Banking Among University Students

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Abstract: Banks confronted tough competition in acquiring and maintaining consumers with their e-banking platforms due to the rising rate of use of e-banking systems. Essentially, improving e-banking service quality is seen as the best strategic strategy for increasing client loyalty to the e-banking system. The purpose of this paper was to empirically investigate a comprehensive mechanism for enhancing customer loyalty toward e-banking platforms via e-banking service. Reliability, website design, privacy and security, and customer service and support were the dimensions used. The objectives of this research included exploring relationships between factors such as customer satisfaction regarding online banking, reliability of service, quality and performance, service privacy and security in transactions, website design and its use, and the service and assistance in the usage, and customer loyalty. The respondents were among part 2 to part 5 students from Human Resources Studies in a higher learning institution. The researcher distributed the questionnaire to the respondents through the online method using social media accounts like WhatsApp, Instagram, and Telegram. The findings of the research included that, value and relevance were insights strategies to develop loyalty among student users. This included development and promotions with products like educational loan assistance, scholarship tracking tools, budget budget-friendly debit cards with student-specific features. Rewards, points, and other incentives should be used to make sure that online banking is being used frequently. Plugging the site along with its social features through a community forum made sure the students provided peer-to-peer support in sharing financial tips and experiences.

Keywords: *Customer Loyalty, Reliability, Privacy and Security, Website Design, Customer Service and Support, Customer Satisfaction, Service Quality*

1. Introduction

Background of the Study

Research on factors affecting customer loyalty in online banking. Providing high-quality online banking services has been considered a key strategy to attract and retain customers using electronic banking platforms. In this context, offering high-quality e-banking services is seen as a fundamental approach to establishing a competitive edge in this service delivery platform. The purpose of this paper was to empirically study a comprehensive moderating mechanism for improving customer loyalty to online banking platforms through online banking service quality (EBSQ) practices. Reliability, website design, privacy and security, and customer service and support were the EBSQ dimensions. The use of structured questionnaires as a communication method was growing rapidly. Banks now offer their services through an electronic banking channel (e-banking). Personal computers were how customers could access electronic banking services, with the terms "online banking", "Internet banking", "electronic banking" and "electronic banking" being used interchangeably in the literature (Ali et al, 2023). The challenges to the banks in acquiring and retaining customers were brought out in the statement of the problem amidst an increasing use of e-banking. It described that enhancing quality in e-banking is a strategic path that can provide the banks with a competitive advantage together with an opportunity to enhance loyalty among customers.

Electronic banking is the process by which a customer interacts digitally with a bank through computers without the need for human contact (Garepasha et al, 2019). Customer loyalty can be defined as the customer's willingness to do business with a company or brand again and again. It is the result of customer satisfaction, exceptional customer experience, and the value of products or services received by a customer from a bank. When a consumer committed to a particular brand, they were not easily influenced by availability or price. He

was willing to spend more as long as he had the same high-quality product or service that he was used to and liked. All companies should strive to increase customer loyalty, which will motivate them to continue using and indirectly increase brand awareness through word-of-mouth advertising from loyal customers. Customer retention is essential, regardless of the size of an organization. New customers are more difficult to convince because they have no previous experience with the services or products offered by the banks. Therefore, the business needs a complete marketing funnel to get people to buy. However, customers who used a particular service were closer to the sale because they knew what to expect. Customer retention allows businesses to forecast growth more effectively, facilitating financial planning. Online banking facilitates consumers to use a variety of personalized banking services and helps banks provide their services to a large number of consumers in a cost-effective manner (Khan et al, 2023).

Research Objectives:
RO1: To examine the relationship between customer satisfaction and customer loyalty in online banking
RO2: To examine the relationship between service quality and customer loyalty in online banking
RO3: To examine the relationship between reliability and customer loyalty in online banking
RO4: To examine the relationship between privacy and security and customer loyalty in online banking
RO5: To examine the relationship between website design and customer loyalty in online banking
RO6: To examine the relationship between customer service and support and customer loyalty in online banking
RO7: To examine the most significant factor influencing customer loyalty in online banking

Research Questions
RQ 1: What are the factors that influence customer loyalty in Online Banking among Part 2 until part 5 students from the Department of Human Resources Studies?
RQ 2: What are the most significant factors that influence customer loyalty in Online Banking among part 2 until part 5 students from the Department of Human Resources Studies?

2. Literature Review

Dependent Variable

Customer Loyalty:
It is a complex process that has played a crucial role in the success of an organization (Fianto et al, 2020). Loyal customers resist price fluctuations and actively promote a particular provider's services to potential customers through positive word of mouth (Alzaydi, 2023). Therefore, loyal customers are considered beneficial for a business. The concept of customer loyalty in online banking is defined as "the tendency of customers to visit the bank's website frequently, use online banking services regularly and share positive words about online banking " (Gautam and Sah, 2023). Online banking has become the preferred choice over conventional financial methods (Kaabachi, Mrad & Fiedler, 2020). According to Haq and Awan (2020), when consumers have experienced high-quality interactive services on an online banking website, they return to the platform and recommend it to others. The demand for internet banking is constantly increasing as customers prefer online banking to visiting physical banks (Islam et al., 2023). However, building trust remains essential for customer retention in digital environments (Shankar & Jebarajakirthy, 2019). Therefore, banks have had to design marketing strategies aimed at providing more value to customers to maintain their loyalty to online banking services (Kartika, Firdaus & Achmad, 2019). In particular, loyal users of online banking tend to share positive words through electronic devices and social media, thus creating a favorable perception of online banking among other consumers (Ozkan et al., 2019).

Independent Variable

Customer Satisfaction:
A wide range of independent variables, including customers' overall level of satisfaction with their online banking experience, make up customer satisfaction (Raza et al., 2020). This variable takes into account many factors, such as usability, efficiency and problem-solving. The study examined customer satisfaction levels with the overall online banking experience and how these levels relate to platform loyalty. Customer satisfaction is

used, designed as an evaluation of feelings regularly over time. User satisfaction is considered the degree to which a user feels that holding or using an object causes optimistic emotions (Raza, et al, 2020). Satisfaction is the emotional response of the individual, characterized by feelings of happiness or disappointment, after a comparison between the perceived performance of a product or result and expectations (Hamouda, 2019). In simpler terms, customer satisfaction serves as a metric to evaluate how well the company's products perform To meet the general expectations of consumers (Pritjahjono, Jahroh & Saptono, 2023). It reflects the adoption rate of a product based on buyer expectations. When products meet or exceed customer expectations, individuals feel satisfaction and exceeding expectations can lead to a higher level of satisfaction or happiness (Salem, Baidoun & Walsh, 2019)

Service Quality:
All the performance and efficiency of the online banking service are included in the service quality (Raza et al., 2020). The impact of service quality on customer loyalty is examined as an independent variable in this study. This variable took into account the overall quality of service delivery, transaction efficiency and information accuracy. Optimizing online banking to meet customer expectations requires an understanding of the relationship between service quality and customer loyalty. One of the main aspects of service quality was transaction efficiency, which measures how quickly and easily users can perform various financial activities on the online banking platform. A smooth and efficient transaction process increases customer satisfaction, thereby increasing the likelihood that they will remain loyal to the service. Another important consideration was information accuracy, as users rely on the online banking platform for up-to-date and accurate information about their accounts, transactions and financial activity. Errors or inconsistencies in this regard can damage credibility and have a detrimental effect on customer loyalty. To optimize their online banking services, financial institutions needed to understand the relationship between customer loyalty and service excellence. Customers who received excellent service and were satisfied with the platform were more likely to have a good opinion and feel safe and secure. Over time, this attitude favorable can evolve into continuous participation and loyalty. The purpose of the study was to provide in-depth insights into the specific aspects of service quality that have a major impact on customer loyalty in the online banking sector.

Reliability:
"The ability of the service provider to deliver the promised services accurately and consistently" (Shankar and Jebarajakirthy, 2019) was the definition of reliability used in the study. Customers' favorable opinions of Internet banking are influenced by trust, which is also a critical component of Internet banking service quality (EBSQ) (Sleimi, Musleh & Qubbaj, 2020). In online banking, credibility served as an independent variable that influenced client loyalty. She was talking about how online banking services are dependable and long-lasting. When customers can rely on the platform's uninterrupted availability, accurate transactions, and seamless system operation, they are more likely to be loyal. The goal of investigating the connection between trust and client loyalty is to ascertain how a dependable online banking experience affects users' propensity to stick with the service (Stevano et al., 2019). Reliability in online banking extends beyond basic operation. It contains the guarantee that consumers can transact uninterrupted, encounter few problems, and depend on the platform's constant availability. In addition to satisfying consumers' fundamental needs, a strong and dependable online banking system fosters trust. Customers are more inclined to incorporate Internet banking into their regular financial operations when they believe it to be dependable. Additionally, examining the connection between consumer loyalty and trust acknowledges the fluidity of digital interactions. Customers are increasingly using online banking to handle their money, so having a dependable platform is essential to establishing a lasting partnership. To maximize the technological features of online banking and to establish a foundation of trust that promotes enduring engagement and loyalty in the constantly evolving landscape of digital financial services, it was crucial to comprehend the subtleties of how trust influences client loyalty. To fully comprehend the elements influencing client loyalty in online banking, the study attempts to identify these complications.

Privacy and Security:
Privacy and security, defined as "the degree to which customers believe that the site is safe from intrusion and that the personal information shared on the platform is protected" (Stevano, Andajani & Rahayu, 2019), were essential elements. Inside online banking. The lack of face-to-face interaction between customers and service providers in the context of online banking has raised concerns about privacy and security issues during financial transactions on online banking sites (Thaker et al, 2019). Privacy and security have played a crucial

role in online banking and have had a significant impact on customer loyalty (Gautam & Sah, 2023). In this study, privacy was related to the protection of personal information, while security was related to the protection of financial transactions. The study examined how a strong privacy policy and a secure online banking environment contributed to customer trust and, therefore, loyalty. Understand the dynamics between Privacy, security and customer loyalty were essential for financial institutions seeking to promote a safe and reliable online banking experience. Security and privacy were the two pillars of a reliable and customer-centric online banking environment. In the context of online banking, privacy and personal data protection were closely linked. Consumers had entrusted financial institutions with sensitive information, so it was essential to have peace of mind knowing that personal information was protected from abuse or illegal access. Therefore, a strong privacy policy includes procedures and safeguards to ensure the privacy and security of user data when interacting with the online banking platform. On the other hand, security in online banking includes the security of financial transactions in addition to personal information. Consumers wanted to know that there was no risk of fraud or illegal access to the secure environment in which their financial transactions were carried out. To detect and prevent any security breach, it was necessary to establish strong encryption techniques, secure authentication processes and continuous monitoring.

Website Design:

Web design includes "various elements of the online banking website that consumers use to interact with the website, including navigation, detailed information and the transaction process" (Ullah, 2022). E-service providers usually design their websites to provide comprehensive information, improve search efforts and stimulate interaction with customers (Zhang and Zhou, 2022). These website designs aim to improve customer trust in e-commerce platforms and encourage loyalty to online service providers (Khan, Arshad, & Munir, 2023). The design of an online banking platform has played a vital role in defining the user experience. In this research, website design was considered as an independent variable affecting customer loyalty (Kaabachi et al, 2019). An intuitive and user-friendly design can improve accessibility, ease of navigation and overall satisfaction. The study aims to find out how the aesthetic and functional aspects of the website design influenced customers' perceptions of online banking and, therefore, their loyalty to the platform. Furthermore, the study aims to examine how these design elements affect customers' perceptions of online banking and, consequently, their loyalty to the platform. The way users interact with the platform, the ease with which they can transact, and the overall satisfaction derived from the design contribute to their loyalty. Understanding the dynamics of this relationship was essential for financial institutions seeking to optimize their online banking platforms and create an environment conducive to lasting customer loyalty.

Customer Service and Support:

Customer service and support played a crucial role in maintaining a positive customer experience. In online banking, customers look for professional help and support when they face problems with online banking. In particular, when technology and website improvements are made by online banking providers, customers tend to seek technical support from these providers (Ozkan et al, 2019). When the online customer support team quickly provided solutions to customer queries, thus demonstrating a transparent and hassle-free recovery policy, customers have developed trust in service providers (Fianto et al, 2020). The proactive nature of the customer support team has been demonstrated by their ability to anticipate and resolve potential issues before they escalate into significant issues, thereby improving the overall customer experience. As an independent variable, customer service and support in this study include the response, efficiency and usefulness of the support system provided by online banking (Haq & Awan, 2020). The study of the relationship between customer service and customer loyalty aims to discover the impact of a supportive and responsive service team on customer loyalty to the online banking platform.

The Relationship Between Independent Variable and Dependent Variable

The Relationship Between Reliability and Customer Loyalty in Online Banking:

The relationship between reliability and customer loyalty in online banking is based on the idea that reliable and stable online banking promotes user trust and satisfaction. When customers can trust the system to make accurate transactions, provide real-time information and act transparently, they are more likely to develop a sense of loyalty (Salem et al., 2019). Another study found only a partial mediating effect of online banking satisfaction between the service quality dimensions of reliability and website design on online banking loyalty

(Ul Haq and Awan, 2020). Reliability is considered one of the factors that influence the responses, although the timely processing of banking transactions without errors is often considered crucial in the evaluation of the reliability of Internet banking providers (Gautam and Shah, 2023). The study aims to find out how the reliability of the online banking platform affects the users' perception of the service and, therefore, their willingness to stay loyal to the platform over time.

The Relationship Between Privacy and Security and Customer Loyalty on Online Banking:
Confidentiality and security are the main issues in online banking and their relationship with customer loyalty is an integral part of this study. Complete and comprehensive information about the company, products, services, privacy policies and security systems play a crucial role in creating trust in e-commerce (Hamouda, 2019). Banks use their websites to disseminate information, offer banking products and services, and improve customer relations. The websites are listed in the financial sector as functional or relational. Functional characteristics include technical dimensions such as visual design, security, privacy, ease of use and interoperability (Haq and Awan, 2020). Customers are more likely to show loyalty to an online banking platform that ensures the protection of their personal information and financial transactions. The study examines how a strong privacy policy and security measures contribute to customer trust and, therefore, loyalty (Garepasha et al., 2019). Understanding this relationship is essential for financial institutions that want to create a safe and reliable online banking environment that encourages long-term customer engagement.

The Relationship Between Website Design and Customer Loyalty on Online Banking:
The appearance of a website has a huge impact on how users interact with online banking. Improving user satisfaction through aesthetic and intuitive design can have a positive effect on customer loyalty. To understand how the aesthetic and functional elements of the design of a website influence the opinions of consumers about online banking, this relationship is studied (Salem et al., 2019). Banks should prioritize these four aspects (website design, usability, security and privacy) to maintain a high level of banking service quality. To achieve customer loyalty, customers must be satisfied (Alzaydi, 2023). Users rate the design of a website in six dimensions: information content, information design, navigation design, visual design, website trust and transaction security (Kartika, Firdaus, & Achmad, 2019). The quality of a website is shaped by usability, informative content and elements of interaction with the service. The study aims to determine the impact of website design on the overall user experience and its subsequent effect on customer loyalty (Khan, Arshad, & Munir, 2023).

The Relationship Between Customer Service and Support and Customer Loyalty on Online Banking:
The customer experience with online banking is greatly influenced by the speed, efficiency and usefulness of customer service and support. This interaction was examined to understand how helpful and responsive support staff influences user opinions and, therefore, their persistence on the platform (Khan et al., 2023). Customer service is one of the factors that influence customer loyalty to organizations (Harazneh et al., 2020). To be effective, banks must prioritize superior customer service, quality, profitability and innovation (Ahmed et al, 2020).

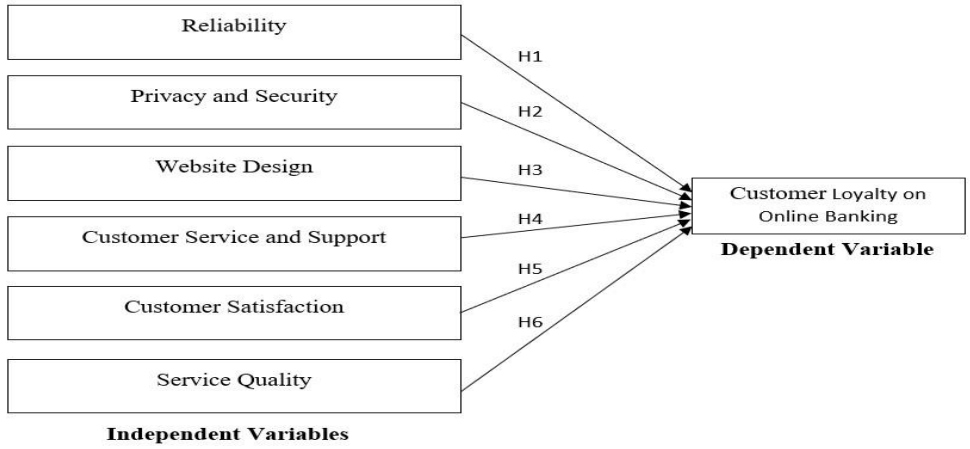
The Relationship Between Customer Satisfaction and Customer Loyalty on Online Banking:
Customer satisfaction is a broad concept that encompasses various aspects of the online banking experience. This relationship is explored to understand customer satisfaction with overall service, including ease of use, efficiency and problem-solving. The study examined the structural relationship between the dimensions of online banking service quality, e-customer satisfaction and loyalty. The results revealed that when more people have adopted the Internet as their primary way of communicating with their bank, the importance of the Internet in banking services increases. Customer loyalty was mainly aimed at keeping customers online by meeting their needs, solving online banking problems and ensuring overall satisfaction (Raza et al., 2020). Customer satisfaction and loyalty have been identified as critical factors that contribute to stronger relationships (Thaker et al, 2019). In the banking sector, the exceptional quality of systems and information helps to increase customer satisfaction and loyalty (Banu, Mohamed and Parayitam 2019).

The Relationship Between Service Quality and Customer Loyalty in Online Banking:
A comprehensive assessment of the performance and effectiveness of an online banking service is called service quality (Salem et al., 2019). The objective of this relational analysis was to determine the extent to which

customer loyalty was influenced by service quality, including transaction efficiency and information accuracy. The objective of the study was to determine the extent to which consumers' opinions about the overall quality of the service influenced their likelihood of remaining loyal to long-term online banking platforms. The efficiency of the transaction played an important role in the evaluation of the quality of the service. Customers using online banking expect smooth and fast transaction processes. A platform that facilitates fast and error-free transactions contributes positively to the overall user experience. When customers perceive a high level of transaction efficiency, it not only meets their immediate needs but also contributes to their overall satisfaction and happiness with online banking.

Theoretical Framework

Figure 1: Theoretical Framework



Hypotheses:
H1: There is a significant relationship between IV1: reliability and DV: customer loyalty in online banking.
H2: There is a significant relationship between IV2: privacy and security and DV: customer loyalty in online banking.
H3: There is a significant relationship between IV3: website design and DV: customer loyalty in online banking.
H4: There is a significant relationship between IV4: customer service and support and DV: customer loyalty in online banking.
H5: There is a significant relationship between IV5: customer satisfaction and DV: customer loyalty in online banking.
H6: There is a significant relationship between IV6: service quality and DV: customer loyalty in online banking.

3. Methodology

Research Design

Data Analysis: This study used correlational research to determine the influence of how customer satisfaction, service quality, reliability, privacy and security, website design, and customer service influenced customer loyalty in online banking from part 2 until part 5 of Human Resources full-time and part-time students in UITM Puncak Alam. In this type of research, the independent and dependent variables were evaluated separately, and the relationship between them was observed. As we only measured and kept this relationship without manipulating any variables, the correlation between factors that influence customer loyalty in online banking was considered non-experimental.

Type of Investigation: This research explored a correlation relationship, investigating the connection between occurring variables. In simple terms, it helped us understand whether there was a relationship between two or more variables and the extent to which they were related. The study considered two types of variables: dependent variables and independent variables. The independent variables considered in this study were as

follows: (i) customer satisfaction, (ii) service quality, (iii) reliability, (iv) privacy and security, (v) website design, and (vi) customer service and support. All these components contributed to the influence of how the factors influenced customer loyalty in online banking among part 2 until part 5 of Human Resources full-time and part-time students in UITM Puncak Alam.

The extent of the Researcher's Interference with the Study: This study utilized a correlational research design aligned with the research objective, conducted within the natural environment of the organization. The theoretical framework was developed with minimal intervention, keeping the research setting unchanged. Respondents experienced minimal environmental distractions while answering the questionnaire, with no significant disruptions.

Study Setting: This study was conducted in a natural environment setting without any artificial alterations. It adopted a non-contrived approach, meaning that no aspects of the research were intentionally manipulated. The research procedures required a minimal level of intervention. The factors under investigation were not controlled or modified. Data were collected through an online survey administered manually to respondents. The primary focus was to examine how customer satisfaction, service quality, reliability, privacy and security, website design, and customer service and support influenced customer loyalty in online banking among part 2 until part 5 of Human Resources students in UITM Puncak Alam.

Population and Sampling

Population: The research population of the study focused on part 2 until part 5 Human Resources full-time and part-time students, specifically in Universiti Teknologi MARA (UiTM) Puncak Alam.

Sampling Size: As a sample for our study, we selected students from various classes of Part 2 until Part 5 of Human Resources full-time and part-time students in UiTM Puncak Alam. Since we used probability sampling, we needed to get a minimum of 196 respondents for this study. Therefore, the total sample size obtained was 251.

Table 1: Sampling Size

No.	Part of Students	A proportionate Number of Students
1	2	70
2	3	42
3	4	54
4	5	85
	TOTAL	**251**

Sample Techniques: There were two major types of sampling, which were probability and non-probability sampling. This included simple random, stratified, systematic, and convenience sampling, among others. For this study, we used a probability sampling.

Data Collection Procedures

For the data analysis in this research, the researcher used primary data to gain valuable insights for implementing the analysis of the study. The researcher used an online questionnaire spread via Google Forms as the medium of data collection. The questionnaire was designed based on the dependent variable and independent variables that were chosen and consisted of seven sections. The questionnaire was distributed among full-time and part-time students from Part 2 until Part 5 of the Degree Human Resources program at Universiti Teknologi Mara (UiTM) Puncak Alam. The researcher distributed the questionnaire to the respondents through the online method with the help of platforms such as WhatsApp and other social media accounts like Instagram and Telegram, enabling the researcher to reach them immediately and conveniently. Additionally, a five-point Likert Scale was used in collecting data, indicated as below 1 = Strongly Disagree 2 = Disagree 3 = Neutral 27 4 = Agree 5 = Strongly Agree.

Table 2: Questionnaire Design

Variables	No. of Item	Sources
Customer Loyalty in Online Banking (DV)	12	(Ozkan et al., 2019)
Customer Satisfaction (IV1)	7	(Ozkan et al., 2019)
Service Quality (IV2)	8	(Ozkan et al., 2019)
Reliability (IV3)	4	(Shankar et al., 2019)
Privacy and Security (IV4)	3	(Shankar et al., 2019)
Website Design (IV5)	4	(Shankar et al., 2019)
Customer Service and Support (IV6)	5	(Shankar et al., 2019)

Data Analysis

The purpose of data analysis was to obtain useful and useful knowledge. In addition, it also helped to synthesize, analyze and interpret all the data collected after conducting the research. Then, all the data we successfully collected through Google Forms were transferred into the SPSS software. All these data were analyzed with the latest version of SPSS (Statistical Package for the Social Sciences) software. Descriptive statistics are often used to explain underlying characteristics data in a study where they provide a simple summary of the sample and data measures. Inferential statistics were used to draw conclusions or predictions with t-tests, ANOVA and regressions. In addition, correlation and regression analysis 28 was found to be essential to examine the relationship between dependent and independent variables based on responses to distributed questionnaires.

Validity Test:

The validity test was one of the significant elements that needed to be included in the research for the quality and accuracy of the questionnaire, which was done by Dr. Maliza Delima Kamarul Zaman.

The purpose of the conducted study was to examine the relationship between customer loyalty and several factors, including (i) customer satisfaction, (ii) service quality, (iii) reliability, (iv) privacy and security, (v) website design, and (vi) customer service support. For this purpose, a total of 251 sets of questionnaires were distributed to Part 2 until Part 5 of Human Resources full-time and part-time students in UiTM Puncak Alam over a month. The study achieved a 100% response rate, as all respondents provided answers to the questions. To ensure widespread distribution, the e-questionnaires were shared through messaging applications like WhatsApp and Telegram given the lack of a clear total population count for the targeted respondents. The response rate of the study is illustrated in Table 3. Total E-Questionnaires Distributed Total Questionnaires Collected Overall Response Rate (%) 251 251 100 Table 3: Response Rate of Study 30 4.2

Table 3: Response Rate of the Study

Total E-Questionnaires Distributed	Total Questionnaires Collected	Overall Response Rate (%)
251	251	100

Demographic Analysis Variable Frequency Percentage (%) Gender: Male Female 185 66 73.7 26.3 Age: 18-20 years old 21-25 years old 26-30 years old 31 years old and above 28 186 11 26 11.2 74.1 4.4 10.4 Marital Status: Single Married 223 28 88.8 11.2 Part of Students: Part 2 Part 3 Part 4 Part 5 70 42 54 85 27.9 16.7 21.5 33.9

4. Results

Table 4: Demographic Analysis

Variable	Frequency	Percentage (%)
Gender:		
Male	185	73.7
Female	66	26.3
Age:	28	11.2
18-20 years old	186	74.1
21-25 years old	11	4.4
26-30 years old	26	10.4

31 years old and above		
Marital Status:		
Single	223	88.8
Married	28	11.2
Part of Students:		
Part 2	70	27.9
Part 3	42	16.7
Part 4	54	21.5
Part 5	85	33.9

Reliability Analysis

Reliability analysis was conducted to some extent to examine the internal consistency of the survey responses. Cronbach's alpha test, which determines the degree of association between a set of items, was used in this research to evaluate scale reliability. In addition, it supported the creation of reliable evidence regarding (i) perceived trust, (ii) privacy and security, (iii) website design, (iv) customer service and support, (v) customer satisfaction and (vi) customer quality. Service According to the table, Cronbach's alpha values exceeded 0.5. These data are applied, which was confirmed by Nunally (1978) as he showed that a value of 0.70 in Cronbach's alpha is considered an empirical rule in research. However, it was preferred to have a value of 0.90 or higher in which the reliability of the items was much greater. All variables in the table have high reliability greater than 0. 5, which shows that the elements of the online questionnaire were reliable, understandable and relevant for studies. No item was removed from the independent variables to ensure a higher and reliable value of Cronbach's alpha, estimated above 0.5 for all variables.

Table 5: Reliability Analysis

Variables	No of Item	No of Item deleted	Cronbach's Alpha
DV: Customer Loyalty on Online Banking	12	-	0.959
IV1: Reliability	7	-	0.948
IV2: Privacy and security	8	-	0.962
IV3: Website design	4	-	0.918
IV4: Customer service and support	3	-	0.934
IV5: Customer satisfaction	4	-	0.933
IV6: Service Quality	5	-	0.954

Table 6: Descriptive Analysis

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
DV	251	1.00	5.00	3.1633	1.08130	-.253	.154	-.399	.306
IV1	251	1.00	5.00	3.3705	.89564	-.262	.154	.111	.306
IV2	251	1.00	5.00	3.3625	.93810	-.255	.154	-.079	.306
IV3	251	1.00	5.00	3.6016	.89924	-.457	.154	.320	.306
IV4	251	1.00	5.00	3.7769	.84736	-.789	.154	1.315	.306
IV5	251	1.00	5.00	3.5817	.98605	-.394	.154	-.178	.306
IV6	251	1.00	5.00	3.4821	.92665	-.190	.154	-.321	.306
Valid N (listwise)	251								

Table 6 shows the descriptive analysis that consisted of mean and standard deviation. The highest mean was scored by customer service and support, while the lowest mean was scored by privacy and security. The table above showed that all variables obtained a maximum value of 5.00, and as for the minimum value, academic performance and behavioral engagement obtained the least minimum value, which was 1.00. Results showed that the score for the dependent variable was customer loyalty in online banking (M = 3.1633, SD = 1.08130). This was followed by the independent variables, which included reliability (M = 3.3705, SD = 0.89564), privacy and security (M = 3.3625, SD = 0.93810), social website design (M = 3.6016, SD = 0.89924), customer service and support (M = 3.7769, SD = 0.84736), customer satisfaction (M = 3.5817, SD = 0.98605), and service quality

(M = 3.4821, SD = 0.92665). As for the distribution of skewness, all variables were highly skewed with a value less than -1. Lastly, reliability, privacy and security, website design, customer service and support, customer satisfaction, and service quality variables were negatively skewed due to values lower than 3. 38

Correlation Analysis

Pearson correlation analysis was used to answer the first research question, which was "What are the factors that influence customer loyalty in Online Banking among part 2 until part 5 students from the Department of Human Resources Studies?" The correlation analysis determined the degree of the existing relationship between the two variables. A result of correlation could be either positive or negative, depending on whether the integer of the correlation coefficient itself is positive or negative. Furthermore, the strength of the correlation was determined based on the value of the correlation coefficient, in which a value that is less than 0.3 shows a weak correlation, 0.3 – 0.7 is considered a medium correlation, and more than 0.7 indicates a strong correlation. Based on the table of correlations, it can be concluded that the correlations were considered medium correlations because the numbers were not more than 0.7.

Table 7: Correlation Analysis

Correlations

		DV	IV1	IV2	IV3	IV4	IV5	IV6
DV	Pearson Correlation	1	.677**	.659**	.540**	.446**	.556**	.524**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000
	N	251	251	251	251	251	251	251
IV1	Pearson Correlation	.677**	1	.754**	.656**	.615**	.629**	.627**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000
	N	251	251	251	251	251	251	251
IV2	Pearson Correlation	.659**	.754**	1	.693**	.625**	.645**	.691**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000
	N	251	251	251	251	251	251	251
IV3	Pearson Correlation	.540**	.656**	.693**	1	.665**	.723**	.659**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000
	N	251	251	251	251	251	251	251
IV4	Pearson Correlation	.446**	.615**	.625**	.665**	1	.649**	.672**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000
	N	251	251	251	251	251	251	251
IV5	Pearson Correlation	.556**	.629**	.645**	.723**	.649**	1	.633**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.000
	N	251	251	251	251	251	251	251
IV6	Pearson Correlation	.524**	.627**	.691**	.659**	.672**	.633**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	
	N	251	251	251	251	251	251	251

**. Correlation is significant at the 0.01 level (2-tailed).

Phrasing Correlation Reliability A Pearson correlation was calculated to examine the relationship between reliability (IV1) and customer loyalty in online banking (DV). The result was r (249) = 0.677, P

Phrasing Correlation

Reliability:

A Pearson correlation was calculated to examine the relationship between reliability (IV1) and customer loyalty in online banking (DV). The result was r (249) = 0.677, P<0.001, indicating a significant relationship between the two variables. This indicated that as reliability increased, there was a corresponding improvement in customer loyalty to online banking.

Privacy and Security:

A Pearson correlation was calculated to examine the relationship between privacy and security (IV2) and customer loyalty in online banking (DV). The result was r (249) = 0.659, P<0.001, indicating a significant

relationship between the two variables. This indicated that as privacy and security increased, there was a corresponding improvement in customer loyalty to online banking.

Website Design:
A Pearson correlation was calculated to examine the relationship between website design (IV3) and customer loyalty in online banking (DV). The result was r (249) = 0.540, P<0.001, indicating a significant relationship between the two variables. This indicated that as website design increased, there was a corresponding improvement in customer loyalty to online banking.

Customer Service and Support:
A Pearson correlation was calculated to examine the relationship between customer service and support (IV4) and customer loyalty in online banking (DV). The result was r (249) =0.446, P<0.001, indicating a significant relationship between the two variables. This indicated that as customer service and support increased, there was a corresponding improvement in customer loyalty to online banking.

Customer Satisfaction:
A Pearson correlation was calculated to examine the relationship between customer satisfaction (IV5) and customer loyalty in online banking (DV). The result was r (249) = 0.556, P<0.001, indicating a significant relationship between the two variables. This indicated that as customer satisfaction increased, there was a corresponding improvement in customer loyalty to online banking.

Service Quality:
A Pearson correlation was calculated to examine the relationship between service quality (IV6) and customer loyalty in online banking (DV). The result was r (249) = 0.524, P<0.001, indicating a significant relationship between the two variables. This indicated that as service quality increased, there was a corresponding improvement in customer loyalty to online banking.

Based on this research, six (6) independent variables were analyzed, including reliability, privacy and security, website design, customer service and support, customer satisfaction, and service quality. The result of the correlation table above showed that all six independent variables were correlated.

Regression Analysis
The regression analysis was conducted to understand which among several independent variables eventually related to the dependent variable. Thus, based on the table below, the results of the regression analysis for this study were shown, which referred to the relationships of independent variables with the dependent variable. Based on the result, the R2 value for this model was 0.0525, which meant that all the independent variables (predictors) explained 52.5% of the variance in customer loyalty to online banking.

Table 8: Model Test

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.144	.231		.624	.533
	IV1	.470	.087	.389	5.404	.000
	IV2	.344	.089	.299	3.855	.000
	IV3	.019	.089	.016	.212	.832
	IV4	-.160	.086	-.125	-1.849	.066
	IV5	.174	.077	.159	2.265	.024
	IV6	.055	.081	.047	.673	.501

a. Dependent Variable: DV

Phrasing Regression

A multiple linear regression was calculated to predict students' customer loyalty to online banking based on (i) reliability, (ii) privacy and security, (iii) website design, (iv) customer service and support, (v) customer satisfaction, and (vi) service quality. A significant regression equation was found, which was F (45.033) =, P<0.001, with an R square of 0.525. Besides, the respondents' predicted dependent variable was equal to DV: customer loyalty on online banking = 0.144 + 0.470 (IV1: Reliability) + 0.344 (IV2: Privacy and Security)+ 0.174 (IV5: Customer satisfaction). Thus, the independent variables IV1, IV2, and IV5 engagement were significant predictors.

5. Conclusion

In conclusion, the study aims to determine the factors that led to customer loyalty to online banking services among full-time and part-time students from Part 2 to Part 5 of the Department of Studies of Human Resources of UiTM Puncak Alam. The context of the study highlighted the need to perfect high-quality online banking services capable of attracting and retaining customers in an increasingly competitive online banking environment. Internet banking service quality (EBSQ) dimensions include reliability, website design, and privacy and security aspects, with customer services and support featuring prominently. The results of the study showed that, of the six variables examined, only reliability, privacy and security, and customer satisfaction showed a significant relationship. The challenges that banks face to acquire and keep customers are highlighted in the statement of the problem against the background of the increased use of online banking services. French The study describes that improving quality in online banking is a strategic path that can provide banks with a competitive advantage, as well as an opportunity to strengthen customer loyalty. This research had several objectives, including exploring the relationships between factors such as customer satisfaction with online banking, service reliability, quality and performance, privacy and security of the transaction services, website design and usability, customer service and support. Define the determining factor important for customer loyalty and therefore identify the same factor among HR students. The conclusion of this study has thus defined a systematic framework to examine and examine the phenomena of customer loyalty in online banking with practical implications for banks that want to improve their online banking offer as a means of developing relationships with loyal customers. In addition, directions for possible future research aimed to emphasize the examination of cultural differences and the use of longitudinal data to gain more accurate insights into customer behavior in the dynamic environment of online banking.

Recommendations

In this dynamic scenario of online banking, customer loyalty, especially among students, requires a multifaceted approach to address the various factors influencing them. Trust and security have been a key factor in this. To achieve this, institutions have improved cyber security measures with a focus on data security and fraud prevention through clear communications and robust systems. Transparent use of data, fees, rules and regulations has been key to building and maintaining trust. Personalized communication further strengthens this foundation with personalized online safety tips and alerts based on each user's activity. It was essential to meet this demand to acquire and retain student customers. This included simplifying the user interface so that it was not only user-friendly but also intuitive and optimized for mobile devices. Offering 24/7 customer support, live chat, FAQs and self-service options caters to busy student plans, replicating the student experience. Effective financial management tools such as access to budget functions, transaction tracking and goal-setting options are present on the online banking platform and help manage users' finances. Value and relevance were sound strategies for developing student user loyalty. This has included developing and promoting products such as student loan assistance, scholarship trackers, and money-saving debit cards with student-specific features. The personalization of financial advice through data analysis meant that their product suggestions matched the needs and goals of their family and each student. This has added another layer of value through partnerships with student organizations or institutions that offer exclusive benefits and offers through joint activities in universities, clubs or events that take place on campus.

A recommendation to improve engagement and build community was to use gamified experiences with prizes, points and other incentives to ensure frequent use of online banking. Promoting the site and its social functions through a community forum ensured that students helped each other by sharing financial advice and experiences. It provides educational resources to its users in the form of financial education seminars, webinars

or blog posts on specific financial issues that affect students and make them feel better equipped and become a more informed and more engaged user base. The site is also constantly monitored and adjusted, which is another key to customer loyalty. Periodic monitoring of customer satisfaction and loyalty through surveys, feedback forms and analytics provided valuable information to identify areas where student needs exist, in addition to areas that require improvement. Responding to feedback was also important to quickly implement changes aimed at adding value to the online banking experience for students and finding ways to resolve their concerns promptly. In addition, it was necessary to ensure that emerging trends and technologies in online banking and financial services were carefully monitored so that the offer could always be improved to meet the ever-changing expectations of student customers.

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Unveiling the Keys to Employee Loyalty: Exploring Factors Affecting Employee Retention

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Abstract: The issue of employee retention is a crucial factor especially if a company wants to remain relevant in the market. The research analyzes how compensation and benefits, training and development, working environment, and reward and recognition impact the retention of employees. This study will employ a quantitative research design that will involve administering questionnaires to employees working in companies around Klang Valley conducted within the context of Malaysia. In this study, the concepts of Maslow's Hierarchy of Needs and Alderfer's ERG Theory will be used in a bid to determine factors affecting employee retention. The sampling technique to be used is non-probability. Therefore, convenience sampling will be used with a view of identifying participants with rich information on their experience and perceptions towards the objectives of the study on employee retention. The study seeks to establish how these independent variables impact employee retention to enhance understanding of Human Resource Management (HRM) practices. Reliability analysis, descriptive analysis, correlational analysis, and regression analysis will be employed as a measure of the strength and direction of these relationships. It will reveal the most critical antecedents to overall employee retention and provide actionable insights that organizations can implement to improve their practices. Therefore, while filling the gap in the literature and targeting the Malaysian industry, this study aims to enhance understanding of the factors influencing employee retention. Finally, its purpose is to help organizations design proper approaches to retain top talents in the company and make them dedicated to work.

Keywords: *Employee Retention, Compensation, and Benefits, Training and Development, Working Environment, Reward and Recognition*

1. Introduction

Background of the Study

Keeping good employees happy and motivated becomes one of the top priorities for Human Resource teams. They are always putting in effort to make sure their top performers are engaged and committed to the company (Goswami, 2021). As indicated by Anilkumar (2024), employee retention refers to the company's ability to keep its employees for a long time. It is a process where the company motivates and encourages its staff to stay, helping the company remain strong and stable. Understanding the factors that influence employee retention is essential for developing strategies to keep valuable employees and maintain a competitive edge (Vijayakumar and Shanthini, 2020). Another study by Hussein et al. (2021) also emphasized that various factors influenced employee retention.

Economic fluctuations affect employee retention rates and other organizational processes as well. The key consequences of high employee retention include employee engagement, communication, compensation, leadership, career development, training and development, work flexibility, job satisfaction, and performance appraisal (Darmayanti et al., 2024). Previous research established that employee retention is influenced by some factors including rewards, supervisor support, training, development opportunities, job characteristics, and work-to-family conflict (Nadeem & Malik, 2021). This study also mentioned that employee retention can be explained by the length of time employees remain with a company and how frequently the company needs to hire new workers to replace those who leave. Employee retention affects organizations globally, impacting their performance, profitability, and ability to retain valuable workers in the face of fierce global competition (Suraihi et al., 2021).

Today, when technology has a more significant influence on organizations than ever before, it feels like

machines are encroaching (Prakash and Philimis, 2022). But organizations still need people as they are the ones who make sure all that technology runs smoothly. So, having good staff is still crucial for all companies. However, employee retention plays an important role in not only getting talented people but also ensuring the long-term commitment of the talent within the organization. To tackle this issue, corporations should start examining how they can keep their employees satisfied by supplementing remuneration, offering incentives and appreciation, and fostering a friendly workspace (Noordin et al., 2021).

In Malaysia, many past studies have thoroughly explored employee retention across various industries, including construction, manufacturing, and services (Zainal et al., 2022) The studies mentioned earlier emphasized how important it is to investigate keeping employees and figuring out what matters to them. Hence, this research seeks to establish how compensation and benefits, training and development, work environment, reward, and recognition are associated with employee retention. This study will determine how all these factors influence employee retention. As for the data collection method in this study, a survey will be conducted on the participants who are employees working in companies around Klang Valley. By highlighting all these factors, the firms may be aware of those factors that most affect the retention of employees.

Problem Statement

In general, the issue of employee retention plays a critical role in organizations that determine the level of employee loyalty (Chauhan and Guleria, 2024). Employee retention is determined by multiple factors which make up an efficient method of retaining employees (Kudtho et al., 2022). Businesses are now paying attention to the concern of retaining talented workers and are seeking ways the manage aspects that affect the ability of workers to stay with their employers (Elangkumaran et al., 2023).

The first issue is the problem of compensation and benefits regarding the ability of organizations to retain their employees (Islam et al., 2022). There is always a problem of employee turnover when employees feel that they are not paid what is expected of them or they even see other companies paying higher remunerations. Similarly, as Maqsood et al. (2023) have indicated, if the employees feel they are underpaid relative to the efforts they put they feel they are being exploited and hence lack motivation to the firm. In a similar study, Sija (2022) found that pay and remunerations play a critical role in unlocking employee turnover in private healthcare organizations in Malaysia. Therefore, additional research is necessary to examine the relationship between compensation and benefits and employee retention.

Second, where there is an effective working environment, people are interested in what they are doing. They have the enthusiasm for what they have been tasked to do. They receive continuous appreciation for their work along with opportunities for career growth and skill development. Another study has suggested that it is important to have good working conditions to keep the employees (Zulkefli et al., 2023). However, as everyone aims at building a good workplace where employees want to be, many organizations struggle with high employee retention. Consequently, this study by Zainal et al. (2022) noted that the working environment has contributed to improvement in employee retention. In addition, a study done by Chatzoudes and Chatzoglou (2022) pointed out that the working environment was the most important factor that influenced employee retention. These results highlight the significance of the working environment in increasing the retention of employees. Therefore, additional research is needed to investigate the relationship between working environment and employee retention.

Third, appropriate training and development enable employees to perform their tasks as expected and enhance their advancement within the company. These programs are well planned to meet the career needs of the employees as well as maintain employee intention to leave. The literature review conducted in academics has revealed that training and development have a positive correlation with employee retention (Islam et al., 2022). However, the problem of employee retention remains a significant concern, even when the company has invested more in training and developing its human resources. Some of the complaints that have been often noted are lack of proper training of the employees leading to the retention of employees. For instance, a study done by Chauhan and Guleria (2024) indicated that low levels of training lead to high rates of retention but low levels of quality services hence low revenue generation while high levels of training lead to low rates of retention but low rates of quality services hence low revenue generation. Additionally, according to Kiragu and Marwa (2022), training and development have impacted employee retention. To manage these gaps, it is

necessary to understand the impact of training and development on the retention of employees.

Lastly, reward and recognition are the critical strategies that address the challenges facing employees to ensure they work hard and remain loyal to the organization. When employees feel valued, it will motivate them to perform at their best, ensuring they stay in the organization. Previous studies have explained the need to have a good reward and recognition to maintain employee retention (Fitri, 2024). However, as good as the reward and recognition system that was put in place, the problem of employee retention has not been fully solved. Previous research from Al Suraihi et al. (2021) found that employees who felt their work was not appreciated experienced low morale and a higher intention to leave. Therefore, there is a need to further study the relationship between reward and recognition and employee retention.

In response to these problems, companies must ask themselves what would satisfy an employee so that the efficient and resourceful personnel would not leave the company. Many organizations are currently attempting to increase the level of employee dedication as well as organizational citizenship behavior. Thus, it must be noted that most organizations have significantly overlapping personnel management practices directed to the goal of making the employees happy, but these practices have to be universal. Therefore, the next action that a company takes naturally is to attempt to identify what affects 'employee retention' most. Thus, it is possible to build a good rapport with the professionals and the company can offer better conditions for them to remain loyal to their organization.

This study seeks to advance knowledge in the field by applying Alderfer's ERG Theory to investigate employee retention in Malaysia. Although previous studies have applied different approaches such as Herzberg's Factors and Maslow's Hierarchy of Needs (Nor et al., 2024; Ndahayo et al., 2023; Hanai and Pallangyo, 2020; Ping et al., 2024) to investigate factors affecting employee retention, this proposal incorporates ERG Theory to categorize and assess attributes like compensation, training, working environment and reward in recognition to employee retention. In the ERG Theory, human needs are categorized into existence needs, relatedness needs, and growth needs, which can shed light on how various aspects of a job meet these basic needs.

This research specifically focuses on employees working in companies around Klang Valley as the main source from which data will be collected. Employees from various companies offer a good cross-sectional sample of the employment market, including various occupational fields and employee types. Due to reaching out to the employees working in companies around Klang Valley, the research encompasses various groups of participants to provide a generalized view of the factors affecting employee retention across industries. This approach also allows for collecting current data from participants who are currently in the process of job hunting or seeking promotion. Many prior investigations are limited to some industry or organization setting, which means that it is difficult to determine how conclusions may cross over to different fields. This kind of approach leads to the emergence of a major research gap considering that the factors affecting employee retention in one industry may not necessarily suit another industry. To fill this gap, the study's purpose is to gather information from a variety of employees working in companies around Klang Valley. As compared to the other research approaches, this technique aims at collecting information from different sectors to have a broader perspective on the factors that lead to employee retention. Such a broader view might also uncover similarities and differences by industry, which might translate into more generalizable and efficient retention approaches.

Research Questions

- Is there a relationship between compensation and benefits and employee retention?
- Is there a relationship between training and development and employee retention?
- Is there a relationship between the working environment and employee retention?
- Is there a relationship between reward and recognition and employee retention?
- Which factors have the most influence on employee retention?

Research Objectives

- To investigate the relationship between compensation and benefits and employee retention.
- To determine the relationship between training and development and employee retention.

- To examine the relationship between working environment and employee retention.
- To identify the relationship between reward and recognition and employee retention.

2. Literature Review

Independent Variables

Compensation and Benefits: In today's fast-paced and competitive work environment, compensation plays a vital role in the workplace by directly influencing job satisfaction. Having good compensation helps the employees to have better financial stability and acknowledges the value of an employee's work (Suryadi et al., 2022). One often overlooked factor that significantly impacts employee retention is satisfaction with compensation (Fitri, 2024). Understanding the influence of compensation on employee retention is important to the organization aiming to retain skilled employees (Samosir et al., 2021). These factors are fundamental to job satisfaction and can significantly influence an employee's loyalty and engagement with their employer (Nor et al., 2024).

In this context, pay can also include any other benefit that an employee receives for valuable services in an organization (Prakash and Philimis, 2022). This is also supported by Sorn et al. (2023) who also consider compensation as all the benefits that are received by employees in exchange for their labor. Such components include their base pay (wage/salary), insurance, retirement, and other bending/emoluments, various forms of leave, incentives for performance, and other fringe elements like lunch, advancement, etc., as offered by the employer. Other sources also defined compensation as including any form of remuneration that an employer provides in return for employees' services, which may include monetary and nonmonetary benefits, salary, allowance, incentives, and paid leaves (Hanai & Pallangyo, 2020).

In the same year, Nor et al. (2024) highlighted that compensation became one of the core determinants of job satisfaction. Where an employee's performance has been quantified in terms of work accomplished, he or she is likely to feel valued and appreciated in equal measure to the financial remuneration offered. As stated by Watkins and Fusch (2022), when Kentucky Fried Chicken (KFC) employees recognize that their salary and promotions are in proportion to experience and outcomes, in addition to receiving a reward, they also feel they are being treated fairly. Therefore, those employees who do their best in an organization and get the necessary appreciation from their employers will remain faithful to their employers. Macaraig et al. (2024) realized that the lack of promotional opportunities, higher pay, and better wages are some of the reasons why employees in Cambodia put up resignation letters as observed by employers.

This statement agrees with previous research that highlights how important it is to offer competitive compensation to keep employees from leaving. A study with 64 teachers in Kenya highlighted that 87.5 percent of the teachers said their salaries were not enough to keep them working at private secondary schools. 76.8 percent of the respondents felt they were not getting adequate compensation. Only a small percentage, 12 percent, felt satisfied with their compensation. The study's overall findings highlight that compensation plays a crucial role in retaining employees (Kariuki, 2020). According to Biason (2020), job satisfaction depends on pay and other factors that are positively linked to employee retention. When employees are happy with their pay and overall job satisfaction, they are more likely to stay with the company, helping it succeed and stay competitive in the long run.

Salary and promotions have a positive correlation with employee retention. The researchers Alshamrani et al. (2023) demonstrated that this element had a beneficial impact on employee retention by discovering that 64.9 percent of the respondents felt their salary was fair when compared to their peers in comparable occupations in other organizations. Compensation is an important part of the total rewards system used by organizations to attract, retain, and motivate employees, encompassing both financial and non-financial benefits that enhance employees' mental and physical capabilities. However, while the correlation between compensation and employee retention is well-established, other research argues that compensation may not influence employee retention. Compensation has no positive relationship with employee retention. Considering all that has been discussed, a study will be conducted to determine whether compensation influences employee retention (Ojediran and Adebayo, 2023).

Training and Development: Measures such as training and development have also been found to influence the levels of retention. Literature evidence proves that training and development activities are positively associated with employee retention (Kumari, 2022). Good training and development always assist in nurturing employees, their skills, knowledge, and attitude to work thereby enhancing their performance (Fabian et al., 2024).

Training and development programs are referred to as an educational upgrade for employees, whether they are in public service or the private sector. They are designed to help people level up in their jobs by teaching them new skills, and knowledge, and giving them a boost of motivation. These programs are important for ensuring that employees perform at their best and feel empowered to succeed in their roles (Prakash and Philimis, 2022). This statement agrees with what other studies have shown giving employees training and development is key to keeping them in the company, especially in IT. Other studies also defined training and development as training and development refers to the systematic and planned process of improving the knowledge, skills, and competencies of employees to help them perform their jobs more effectively.

Training is important for keeping employees of all ages, helping them grow both in their skills and how they behave at work. Making sure everyone can access training programs is important to help the company grow better, especially by improving how well people work and using new technology (Ojediran & Adebayo, 2023). Training was defined as a process that enhances employees' skills and knowledge, thereby enhancing their job satisfaction and retention, and ultimately aiding the company in achieving its objectives. Training serves as a tool for personal growth and job improvement, ultimately benefiting the company (Alharthy & Marni, 2020).

Other than that, training is like a focused program where you learn new things and develop skills to tackle specific tasks better while development involves broader learning experiences that prepare individuals for future roles and growth opportunities (Murtiningsih, 2020). Studies have found that training programs are one of the main factors to keep employees around. For example, a study by Calinao et al. (2020) showed that when companies invest in training and development, it helps to hold on to employees. Without good training, some workers might leave, which can cost the company money and resources.

Working Environment: The working environment is a physical condition and social features such as the physical geographical location in which an employee performs their job. A good working environment can offer a pleasant working experience and adequate resources, and it is said to greatly in retaining customers. The study by Alshamrani et al. (2023) showed that a good working environment is linked to keeping employees longer. When employees are happy with their work conditions, they are more likely to stay with the company. In short, creating a positive work environment can help companies keep their employees and lower turnover rates.

According to Xuecheng et al. (2022), the working environment refers to how safe employees feel at work and how well they can communicate their opinions about their surroundings with the company. After studying the research paper, it was concluded that the working environment influences employee retention in the workplace. Prakash and Philimis (2022) conducted a study on the definition of working environment and according to them: Working environment refers to the work environment as the place and conditions in which a person performs their duties, interacts with colleagues, and operates in a physical environment.

All of these have a direct impact on the employees' level of contentedness, meetings, communications with other employees, group cohesiveness, performance rates, and even their well-being. For example, a study assessed the working conditions of 366 employees operating in Saudi Arabian pharmaceutical firms and identified that 68 percent of the responders stated that they were comfortable with the working conditions offered by their employers to continue working in the company. Interestingly, only 18. Only 2 percent of the respondents dissatisfied with the working environment labeled themselves as wanting to quit their jobs. These results indicate that the work environment of the target organizations has a direct positive effect on staff turnover within the pharmaceutical companies in Saudi Arabia (Alshamrani et al., 2023).

In the Philippines, In the case of the Filipino seafarers' decision to remain on international cruise ships, one common determinant is the work environment. Although the workplace environment has a role to play in

retaining employees, other studies indicated that it is not the only factor. Other factors include pay equity and remunerated wage, training and development, and employment security to retain Filipinos onboard cruise ships. Therefore, it stated that Filipino employees remain to be highly appreciated for their capacity to work hard and be friendly with guests most of the time, which improves their stay (Calinao et al., 2020). The present study also proves this assertion, given the study conducted by Noordin et al. (2021) which suggests that the work environment is among the significant determinants of job retention in the eCommerce logistics sector.

Naz et al. (2020) observed that positive environments in workplaces not only enhance the performance of workers, but they also remain loyal to their workplace. These environments include civil treatment, proper communication, development prospects, rewards for hard work, and encouragement. This leads to higher levels of motivation, commitment, and satisfaction with the job leading to; the organization benefiting from the reduced expenses required to recruit and train new employees. According to Frye et al. (2020), the work environment has a big effect on how satisfied Generation Y employees are with their jobs in the hospitality industry. This satisfaction then influences how committed they are to staying in that industry. Having a good work environment is important for keeping younger workers in hospitality.

Reward and Recognition: Reward and recognition play an important role in keeping employees motivated and loyal to their organizations. As companies aim to boost productivity and stay ahead of the competition, it's important to understand how these elements affect employee behavior. According to Prakash and Philimis (2022), reward and recognition can be defined as ways to show an appreciation for employees' hard work. This can be done through various methods, both tangible and intangible. The goal is to acknowledge and appreciate employees' efforts fairly and promptly, fostering a supportive and appreciative workplace. Rewards are a form of acknowledgment for the work and contribution someone has made (Choi & Presslee, 2020).

Kryscynski et al. (2020) have shown that rewards and recognition, including incentives like public acknowledgment, awards, and tangible services, play a crucial role in employee motivation. This is also supported by the research from Nor et al. (2024) that revealed when people get rewarded or acknowledged for doing something well, it makes them want to keep doing their best. So, giving rewards and recognition for outstanding performance can be a powerful way to keep people motivated and engaged. Previous studies have shown that researchers have been focused on understanding what motivates employees to stay in their jobs, particularly when it comes to rewards and recognition. Kršlak and Ljevo (2021) found that rewards directly motivate employees to work towards the company's goals.

A strong relationship between reward and recognition and employee retention has been highlighted in the literature. Recent research emphasizes how rewards boost employee commitment, loyalty, and willingness to stay with the company. They make employees feel valued and respected, which encourages them to stick around (Noordin et al., 2021). When rewards are structured fairly, employees feel properly appreciated for their hard work and skills, which makes them more likely to stay. This finding is aligned with Calinao et al. (2020) who found that reward and recognition as one of the factors that contribute to employee retention.

Dependent Variable

Employee Retention: The issue of employee retention has become increasingly important, and researchers have tried to determine strategies for retaining staff members. According to Biason (2020), companies need to focus on job satisfaction and motivation factors to maintain employee retention. Studies have revealed that elements like job satisfaction, commitment to the firm, and a healthy balance between work and personal life are critical in determining how long people stay with a company. A study among 420 employees in Cambodia highlighted several key factors that influence employee retention in private companies in Cambodia. The researcher found that compensation and a good work-life balance, both of which significantly boost job satisfaction and help keep employees from leaving (Nor et al., 2024).

Subsequently, in a survey conducted by Ahmed and Vijayakumar (2024), factors affecting retention of employees referred to job satisfaction, career advancement, pay, interesting tasks, training and development prospects, organizational culture, working conditions, work-life balance, stress, and turnover. Another study has described employee retention as an organizational effort to cultivate and maintain qualified employees to meet organizational needs for an efficient working force while practicing strategic retention to check human

capital with organizational goals (Elangkumaran et al., 2023).

Hypothesis Development

The following is the summary of the sources selected to support the hypotheses of this research based on the related literature in Table 1:

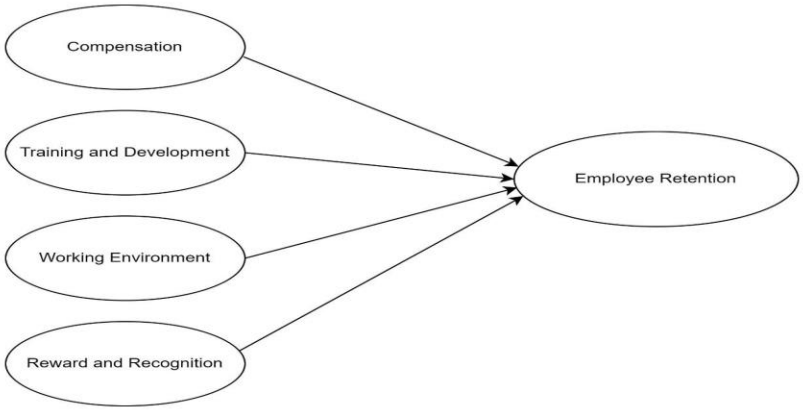
Table 1: Summary of sources supporting the hypotheses

Item	Hypotheses	Previous Studies
H1	Compensation and benefits have a significant effect on employee retention.	Suryadi et al. (2022) Fitri (2024) Nor et al. (2024) Sorn et al. (2023) Macaraig et al. (2024) Biason (2020) Kariuki (2020) Vijayakumar and Shanthini (2020) Prakash and Philimis (2022) Hanai and Pallangyo (2020) Watkin and Fusch (2022) Alshamrani et al. (2023) Murtiningsih (2020) Ojediran and Adebayo (2023) Saputra and Riana (2021) Samosir et al. (2021) Siaw et al. (2022) Shrestha and Prajapati (2024) Mohamed et al. (2023) Kumar (2021)
H2	Training and development have significant effects on employee retention	Kumari et al. (2022) Fabian (2024) Kiragu and Marwa (2022) Musundire (2021) Merican et al. (2022) Siaw et al. (2022) Ojediran and Adebayo (2023) Nazeem and Malik (2021) Ghani et al. (2022) Nguyen (2020) Prakash and Philimis (2022) Murtiningsih (2020) Calinao et al. (2020) Alharthy and Marni (2020) Nor et al. (2024) Macaraig et al. (2024)
H3	Working environments have a significant effect on employee retention.	Xuecheng et al. (2020) Ndahayo et al. (2023) Vijayakumar and Shanthini (2020) Prakash and Philimis (2022) Zainal et al. (2022) Alshamrani et al. (2023) Calinao et al. (2020) Naz (2020) Frye et al. (2020) Islam et al. (2022) Chatzoudes and Chatzoglou (2022) Rahmani and Prayoga (2023)

		Noordin et al. (2021) Nor et al. (2024) Macaraig et al. (2024)
H4	Reward and recognition have a significant effect on employee retention.	Nor et al. (2024) Prakash and Philimis (2022) Caredo et al. (2022) Prakash and Philimis (2022) Noordin et al. (2021) Calinao et al. (2020) Robertson (2024) Al-Suraihi et al. (2023) Masputra et al. (2023) Choi and Preslee (2020) Kryscynski et al. (2020) Kršlak and Ljevo (2021) Macaraig et al. (2024)

Conceptual Framework

Figure 1: The proposed conceptual framework for the Employee Retention Model



3. Research Methodology

Research Design

The research design for this study will be correlational research. Correlational research can be defined as the direct relationship between at least two factors without any hint of attributing the impact of one variable on another (Salkind and Frey, 2020). Besides, the research design is a strategy, plan, and structure to capture ensured in controlling variance and searching question. It is a good plan that helps research specify the way and procedure to collect and analyze data and information. In this study, the researcher will try to find out whether compensation, training and development, working environment, reward, and recognition influence the retention population of Klang Valley. Descriptive research aims at the development of accounts of facts in features of a population. It also enables the researchers to find out which of the elements contributed to the particular case or result in question.

Population

For this research study, the target population or the target respondents are a group or category of people with the same characteristics and features to act as the respondents and participants of this research. The purpose of this study is to benefit from the factors that might influence employee retention in different industries. Therefore, the target population for this study would be individuals with working experience within different industries since they would be able to offer relevant information on matters concerning employee retention. It can be a variety of population groups such as by age, education level, years of service, and income level since

they all have working experience in the industry. The country chosen for this research is Malaysia, which will be specified in certain locations in Klang Valley. The data will be collected from those people who are working in various companies. The reason for choosing the target locations in this study is because it has various types of industries, and the factors that influence employee retention are different. Furthermore, it is also a multicultural country where people from different races and religions, with different skin colors, and different cultures exist. Thus, it will be possible to make the target population contribute different views on the research variable. In some ways, it can improve the result of the research since it gathers data from different people in this research.

Sampling Technique

The sampling technique as highlighted by Mulisa (2023) consists of a probability sampling technique and a non-probability sampling technique. Probability sampling techniques involve random selection, and every member of the population has a known likelihood of being selected. On the other hand, non-probability sampling methods do not give equal chances to every unit, and the probability of a given unit being selected is not given. Non-probability includes convenience sampling, judgmental sampling, quota, or purposive sampling, and snowball sampling. In this study, the researcher plans to use convenience sampling because the time amount of money available for conducting the research and the ease of accessing participants at any given time is convenient.

Unit of Analysis

The unit of analysis in this present study will involve employees working in companies around Klang Valley. The researcher assumes that working employees would have some opinion on employee retention issues.

Instrument

In the context of this study, the content of the questionnaires is categorized into the following three parts. Based on the research objectives, each section is subdivided as follows:

Table 2: List of Instruments

Section	Number of Items Questions)
Part A: Demographic Profile	6
Part B: Dependent Variable (Employee Retention)	6
Part C: Independent Variable (Compensation and Benefit)	6
Part D: Independent Variable (Training and Development)	6
Part E: Independent Variable (Working Environment)	6
Part F: Independent Variable (Reward and Recognition)	5
TOTAL	**35**

Plan for Data Analysis

Reliability Analysis: Reliability analysis aids in determining the consistency and stability of data, as well as testing the connection between various scale components (Suhartini et al., 2021). In this study, Cronbach's alpha will be used to determine the internal consistency of the variables while doing reliability analysis using the Likert scale (Karaca et al., 2022).

Descriptive Analysis: According to Fulk (2023), descriptive analysis refers to a type of data analysis that aims to interpret, describe, and constructively summarize the data points which enable the researcher to determine the similarities among variables and detect outliers. The descriptive analysis is an important component of the researcher because it provides necessary information for the reader to interpret the findings. Thus, in this study, the data gathered from all sections of the questionnaire will be displayed in the format of bar graphs, pie charts, and tables to evaluate the general information.

Correlational Analysis: Pearson's coefficient of correlation is a statistical technique that tries to establish the nature and extent of the relationship that exists in two sets of quantitative data when one variable has a direct relationship with another variable (Rony et al., 2023). Thus, the correlation coefficient could be used for measurements of the association between two variables with a $p < 0.05$ indicating statistical significance. The sign refers to the nature of the relationship: a positive sign means that variables are rising or falling together,

and a negative sign that they are falling together. In this study, the researcher will use the statistical software SPSS version 27 to describe and analyze the correlation coefficient between two variables.

Conclusion

This study has four independent variables (IVs): compensation, training and development, working environment, and reward and recognition, and a dependent variable (DV) of employee retention. This study looks to extend existing research on the relationship by examining the mentioned backgrounds of employee retention. The study seeks to establish how these independent variables impact employee retention to enhance understanding of Human Resource Management (HRM) practices. Therefore, while filling the gap in the literature and targeting the Malaysian industry, this study aims to enhance understanding of the factors influencing employee retention. Finally, its purpose is to help organizations design proper approaches to retain top talents in the company and make them dedicated to work.

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Focus Group Interview: University-Industrial Collaboration

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Abstract: Business innovations can introduce novel and imaginative concepts, particularly within digitalization. Innovations have the potential to stimulate the advancement of enterprises, fostering market expansion, enhancing competitiveness, and optimizing profitability. Nevertheless, the implementation of innovation may be achievable in collaboration. Collaborations and interactions between academia and industrial entities may yield improved outcomes. Nevertheless, the presence of obstacles between academia and industries could harm the long-term viability of commercial innovation. The concerns and challenges faced by local institutions and enterprises in Malaysia are examined within the framework of a case study. Data was obtained from a random sample of Chief Executive Officers (CEOs) across several industries. A focus group was conducted with 15 representatives from Small and Medium Enterprise (SME) companies and one moderator to lead the discussion. The findings from the focus group have been transcribed and analyzed based on their sharing. The rationale for focusing on CEOs was their role as critical decision-makers responsible for driving corporate innovations. The collection of perspectives from academia and industries was facilitated through face-to-face interviews. The study provided suggestions for potential avenues of future investigation.

Keywords: *Business Innovation, University-Industrial Collaboration, Engagement, Business Partner, SME*

1. Introduction and Background

From the standpoint of business sophistication, more metrics are currently needed to assess the level of collaboration between universities and industries. The relationship between industry and academics is vital for enhancing and bolstering the contribution of business innovation. The observed trend of a progressive rise in patent applications from Malaysian universities, along with the increasing commercialization of research findings, indicates the expansion of the innovative ecosystem inside the country. However, colleges need help implementing policies limiting or restricting the total commercialization rate. Corporations commonly acquire a promising intellectual concept in an ideal inventive environment, engaging in large-scale production and ultimately reaping substantial financial gains. However, there is sometimes a disconnect between industry practitioners and Malaysian institutions, as academics frequently need to gain firsthand experience of the challenges faced by enterprises.

One of the primary catalysts for collaborations between industry and academia is generating commercial innovation, which is crucial for maintaining market competitiveness. Industries commonly perceive innovations as catalysts for developing innovative products and services. Organizations that include innovation can have several benefits, including enhanced growth, expanded market reach, increased competitiveness, and maximized profitability. The term "innovations" pertains to the diverse range of processes that individuals or industries use to generate novel ideas for products and procedures and revitalize existing products and operations from a new perspective. Innovations have the potential to catalyze and facilitate business growth and adaptation to the marketplace. Hence, an exploration was conducted into the concerns and challenges between Malaysian local institutions and industry.

2. Literature Review

Collaborations typically involve individuals or two parties in pursuit of a shared goal. Collaboration is necessary to acknowledge the objectives and roles of everyone involved. The core aim of academics is to acquire and disseminate groundbreaking fundamental research and education of independent scientists. In contrast, the primary goal of industries is to generate profit for shareholders, usually through innovation. Please articulate these distinctions equated with failures of collaboration between industry and academia.

Most Malaysian universities have established formal collaborations as part of core responsibilities with industries in curriculum development, teaching and learning, research and development, consultations, and suitable industrial placements for students. Academic and industry leaders generally have a mutual understanding of collaboration. The benefits typically include i) increased research and innovation through joint research projects, ii) delivery of innovative commercial products, iii) improvements in teaching and learning, iv) enrichment of students' knowledge and their ability to work, and v) provision of new funding to higher education institutions. Collaboration with industry is crucial for academics to establish scientific knowledge and obtain industry data. For academics, the benefits include i) career opportunities, ii) research funding, iii) awareness of industry trends, and iv) inspiration through discussions on applications. One potential area is when industrial doctoral students are generally identified as critical stakeholders who embody the circulation between i) practice and university and ii) between practice and research. University and industry boundaries continuously validate and test industrial-specific empirical results and models. Thus, increased research quality and dissemination of research results that strengthen organizational legitimacy could be reported (Demircioglu & Audretsch, 2019).

From the industries' perspectives, university-industry collaborations are essential, particularly in scientific-based research projects, to mitigate production problems (Kaymaz & Eryigit, 2011). When entering problem-based research, industries typically expect contributions and benefits from universities. For instance, the solution to the problem exists when one participates in research. In addition, the relationship with academia is to i) expand networks, ii) prompt the 'thinking of outside the box' principle, iii) generate training programs, iv) encourage new talents for hiring, and v) open access to specialized, world-leading resources. Contact establishment and knowledge exchange are just some advantages for both parties.

Furthermore, a solid commitment to sustaining project progress and outcomes is critical to successful partnerships (Rahm, Kirkland & Bozeman, 2013). Industrial employees typically set research agendas and review research progress and findings. The faith of the industrial partners in academic team knowledge and the desire to employ project outputs are conclusive criteria for the success of collaborations (Barbolla & Corredera, 2009). These elements influence industrial partner commitment. Therefore, it is acknowledged that industries have equal roles and that universities and companies complement one another.

3. Research Methodology

Focus Group Sample

The present study was conducted as a focus group exercise that involved business analysts, project managers, product and development officers, business engineers, and research and development officers from 15 small and medium-sized enterprises (SMEs). They were chosen because they were key individuals who were involved in leading research in various industries such as agriculture, graphic design, industrial design, marketing, and information technology. First, a group invitation was sent to initialize focus group discussions. Second, purposeful sampling was employed to ensure that the group comprised individuals representative of sample criteria and work profiles. Third, the sample criteria listed participants who experienced collaborations with academia. Fourth, the group's ages ranged from 35 to 50 years old. Fifth, the group comprised ten men (66.67 percent) and five women (33.33 percent). The group convened i) three business analysts, ii) three project managers, iii) three product and development officers, iv) three business managers, and v) three research and development officers at the group, department, and research institution levels. Table 1 shows the summary of the respondents' profiles.

Table 1: Respondents Profile

Representative	No of Frequency
Gender	
Female	10
Male	5
Position	
• Business Analyst	3
• Project Manager	3

• Product and Development officers	3
• Business managers	3
• Research and development officers	3

The focus group discussions explored the challenges of industry and university collaborations. The group was first introduced to some basic concepts of industrial and university collaborations to ensure the goals were met. After that, the following questions were asked:

- What are your university collaboration aims and goals?
- What are the difficulties that you face during the collaboration?
- What are the conflicts or arguments that escalate?
- What are your expectations from public or private universities

Procedures and Technique of Analysis

The group was subdivided into groups of five participants who differed by industry. In groups, they responded to the questions for one hour, facilitated by a moderator. The focus group and sub-group discussions were carried out openly to encourage discussions and exchange of personal experiences, opinions, and views. The focus group discussions were recorded and transcribed into a textual account comprising the essential experiences and views. The transcribed interview document was returned to the group for comments and feedback. The emerging categories constructed a range of appropriate conceptual categories that saturated, filled, supported, and provided recurring evidence that adequately explained the data (Baker & Edwards, 2012). Member checks were carried out for accuracy before the transcribed interview document was sent for analysis. Subsequently, a thematic analysis was used to interpret the narrative and identify emerging data trends and patterns. The conceptual nature of this study emerged as a field of research interest. The primary investigator read the interview transcript; it was coded separately. Next, the primary investigator discussed coding to determine themes that emerged from the research and the triangulation between the respondents. The validity of the focus group sample represented a relatively broad selection of different industrial areas. The age distribution among the focus group discussion participants was even, and the participants' professions differed by position and expertise. Finally, the focus group discussion participants most likely represented a group of industries that nurtured an interest in university collaborations through their voluntary participation.

Research Ethics

Before the focus group discussions were conducted, all the participants were notified concerning i) voluntary involvement, ii) rights to withdraw without explanation, iii) confidentiality, and iv) how data were archived and destroyed. After receiving written and oral information about the project, all participants gave their oral informed consent. The information concerning participation was provided again at the beginning of the interviews. As researchers, no conflict of interest concerning the publication of data was reported.

4. Results

Findings from Focus Group

In the following section, the findings present the analysis of the challenges in industry-university collaborations. The findings were categorized into the following themes: i) What are your university collaboration aims and goals? ii) What are the difficulties that you faced during the collaboration? iii) What are the conflicts or arguments that escalate? Moreover, iv) What are your expectations from public or private universities?

A. What are your university collaboration aims and goals?

The first question was a general inquiry into the participants' projects with the universities. The participant spoke of the goals and interests that guided the collaboration, "I collaborate with the university to generate new and fresh ideas from young individuals or students that will benefit the businesses." Another participant agreed and said, "I think our potential customers in the market could tackle using new ideas from students or young individuals because they accommodate the current demands and business opportunities." Another participant also mentioned that the fresh ideas universities share are competitive advantages to tackle the competitive markets. One participant also mentioned, "I mostly prefer to work with the university because the

solutions as provided by the experts help me solve the current problem ."Another participant agreed and said, "The university has the experts we do not have, so with the collaboration, they fulfill our needs by sharing their knowledge and expertise." Another participant highlighted, "We look forward to collaborating with the university because the university has the facilities and equipment, such as a laboratory, for experiments and activities we do not have. "

The following themes emerged after an analysis concerning the recording and transcript was carried out: i) The principal objective of collaboration in response to new business ideas and industry evaluations, ii) controlling competitions, iii) modification of market demands, iv) development of new products, and v) solutions to existing company problems. Industry characteristics such as rapid technological change, product life cycles, and intense global competitiveness altered the competitive environments in which many firms currently and significantly operate (Wright, Clarysseb, Lockett & Knockaertd, 2008). The industry-related difficulties prompted the requests for collaboration to boost industrial innovation and economic competitiveness through information exchanges between the academia and commercial sectors. Thus, collaborations are often recognized as a possible technique to build organizational capacity for open innovations (Ankrah & Al- Tabbaa, 2015).

B. What are the difficulties that you face during the collaboration?

The second question concerns the difficulties of collaborating with the university. One of the participants said that the collaboration "cost in terms of time to fit with the industry requirement ."The participant explained that they had to align their schedule for availability to fit the university academic calendar. Another participant argued, "When we want students' ideas, we have to wait for the students' availability either before or after the examination." Furthermore, one participant highlighted that "the lecturer has to comply with the academic calendar because they have commitments such as classes and examinations. Due to the schedule, we must consider delaying our project and complying with the university requirement".

In addition, the participant mentioned, "There is a commitment, but not every university will give their commitment to concentrate on the project." Another participant also said, "I found that there is a lack of commitment from the university in the middle of the project because they have other commitments such as teaching and learning". A participant also agreed and said, "The dual roles played to realize the project successfully caused us to give extra time and tolerate the university."

Several topics emerged following the analysis of the recording and transcript discussions. The issues concerning the collaboration between industry and university were grouped into the following broad categories: i) time management, ii) commitment, and iii) communication. The temporal horizons of long-term industry-academia collaborations were analyzed (Runeson, Minor & Svener, 2014). The finding revealed that commitment and time management were often industrial rather than academic priorities. The tardiness and lack of commitment presented risks of tension and frustration on both sides of the collaboration. Although timeliness is vital for industry, it is less critical for academics when significant issues of industry-academia collaboration are raised (Gregory, Barroca, Taylor, Salah & Sharp, 2015). Finally, the findings emphasized the importance of designing research outcomes in various ways to ensure that the findings were relevant to miscellaneous stakeholders.

C. What are the conflicts or arguments that escalate?

The third question involved the responses of one participant: "I have a conflict with the cost of research required by the university." The participant explained that "the cost is high, and we cannot comply with the proposed cost. As a result, we have to reject the cost, which poses a conflict for us to collaborate with the university". Another participant agreed by saying, "We can provide the materials and suppliers with the lower price to the university to facilitate them to do research and development, but sometimes, the proposed materials are not seen fit by the university. They prefer to have their own or employ commonly used suppliers and materials".

In addition, another participant mentioned, "We are having a conflict of ideas with the university." He explained that "some universities lack experience in market fields although they have experience with theories and concepts ."Other participants agreed and said, "We sometimes have a conflict between meeting the project's

outcomes and the result which does not fit the industry's demands. Moreover, another participant mentioned, "Sometimes we argued about the proposed solution and design as requested by the university, which worked against the expectation and outcome of the project."

The abovementioned findings associated costs and ideas with the escalated arguments. Close collaborations between academia and industry may lead to possible conflicts (Gregory et al., 2015). The goals of businesses and universities differed considerably; However, industries were mainly profit-oriented, and the primary goals of the universities involved the production of knowledge to share usable and publicly accessible research results, particularly in the form of education. These differences in goals and funding sources may have led to ethical concerns.

Moreover, the industry found that both parties were involved in conflicts concerning the imbalance of expectations. Inequality is explained in terms of costs and benefits, which form the foundation of crucial issues. The SMEs found that the biases only benefited the university as opposed to SMEs. As expressed in the first discussion, the industry and university outcomes involved different outcomes and challenges to construct a mutual understanding. One common challenge, as highlighted by the industry, was delivering outcomes and accommodating industry expectations (Hillerbrand & Werker, 2019).

D. What are your expectations from public or private universities?

For the fourth question, the participants mentioned, "We expect that the objective of the project and timeline of the project will meet as we both agree." Another participant highlighted that "we expect to sustain the long-term collaboration with the university and have a good relationship with the university ."One of the participants also agreed that "the collaboration with the university has to be sustained and that the continuity of the project with the university may benefit both parties ."Furthermore, one of the participants added, "We expect the collaboration will benefit both parties to fulfill interest and achievement." One participant mentioned that he preferred to collaborate with the university as the collaboration returned benefits, fulfilled the lack of resources from the industry, and forged relationships with the university that could strengthen the future.

Based on the findings above, most industries expect a long-term collaboration with universities. They believed that collaboration could help skills development through education and training and the adoption of knowledge such as innovation technology transfer and entrepreneurship (Stevens & London, 2019). Collaborations typically facilitate the formation of knowledge with the support of experts and experienced individuals in the industry who can give the right direction to enthusiastic, intelligent students and train them as future experts (Sohimi, Affandi, Rasul, Yasin, Nordin & Adam, 2019). Furthermore, industries and institutions must highlight the emerging skill needs within industry requirements and incentives to industries that encourage training collaboration (Agostini, Nosella & Venturini, 2019). Finally, collaborations between firms could strengthen networks and help promote the capabilities necessary to translate market opportunities successfully and manage human capital (Roshani, Lehoux & Frayret, 2015).

The findings from the focus group generated the managerial implication and recommendation as the following discussion:

Mutual agreement between industry and academia

Agreement between industry and academia is critical to the effectiveness of collaboration. Thus, a systematic approach to achieving mutual understanding between industry and academia should be considered. The collaboration agreement is founded on the fact that all projects are unique. However, projects' aims, outcomes, and expectations must be investigated further to ensure that partnerships are effective and mutually agreeable. Examining the terms of agreements is critical to building the foundation for industry and academia for potential project collaboration opportunities. To manage efficient collaborative outcomes, universities might be better aware of the present state and long-term trends in research policies, market trends, financial management, human capital development, and day-to-day administration. The objectives of projects and research programs must be developed collectively to generate clear expectations regarding what and when projects could be completed. Finally, industries require university connections to stay abreast of new technological developments and maintain competitive measures against competitors.

Commitment to collaborations

Participation in collaborative projects comprises a contractual commitment and interpersonal relationship commitment among parties. Commitments in the context of relationships are likely to be a critical component of effective collaborative relationships, particularly for small business organizations with limited resources and a high degree of mutual reliance (Azman, Norzaini, Sirat, Morshidi, Pang, Vincent, Lai, Yew Meng, Govindasamy, Anantha Raman, Din, Wardatul Akmam, 2019). The importance of commitment could be seen in the context of complementary conditions that i) provide safety and security, ii) prompt the exchange of ideas, resources, and knowledge, iii) prevent opportunistic behavior, and iv) align performance goals between partners (Pinho, 2016). Moreover, commitments foster business relationships across universities, and parties are willing to invest time and resources to sustain long-term benefits due to the collaboration (Hammarfjord & Roxenhall, 2017). Moreover, commitments increase the likelihood of continuity and effective collaboration between industries and universities.

Knowledge transfer in collaboration

Collaborations typically involve knowledge transfer, one of the strategic critical drivers of innovation and economic progress. First, collaborations facilitate the commercialization of new scientific knowledge within businesses. Second, researchers benefit from interactions with industries as the interactions stimulate new routes for investigations and miscellaneous financing. Third, the transfer of knowledge is enabled to benefit organizational settings through teaching, interaction management, and data and technology sharing. Knowledge could transfer through explicit or tacit knowledge. Prototypes, formulas, or manuals could communicate the explicit knowledge. Often, such knowledge is shared via contractual agreements such as patents (Vries, Dolfsma & Gerkema, 2019). Thus, the success of knowledge transfer is contingent upon its ability to be appropriately applied to the settings. Transferred tacit knowledge requires interaction to cultivate competence and prompt more direct collaborations and interactional expertise (Canhoto, Quinton, Jackson & Dibb, 2016); academic engagements, rather than patenting or licensing, are the most effective methods of information transfer because academic engagements involve more significant personal interaction. Thus, successful knowledge transfer between industry and university might minimize the conflicts (Bernhard & Olsson, 2020).

5. Conclusion

The challenges that SMEs confronted when collaborating with universities were explored. A focus group discussion was conducted, and data was collected randomly from 15 SMEs. The findings showed that the objectives of collaboration from the industry's perspective were the i) circulation of new business ideas, ii) management of competition, and iii) adjustment of market demands, product development, and solutions to existing business issues. As expressed by the industries, common difficulties included i) time management, ii) commitment, and iii) communication. In addition, conflicts between university and industry collaboration typically escalate in the context of costs and ideas. Finally, the expectation of collaboration could contribute to more significant benefits and advantages for both parties. The findings suggested recommendations for future studies. The researchers will continue to investigate the issues raised in this finding.

Overall, this finding supported the Malaysian Education Blueprint 2015-2025 (Higher Education) because most academics and industry players might better consider collaborations that benefit both parties equally. Numerous benefits are captured, including i) enhanced teaching and learning, ii) more excellent student knowledge and employability, and iii) new revenue streams for academic institutions. Industry and academic collaborations are critical to catalyzing innovation and growth in technology. While the initiative often focuses on addressing solutions of near-term commercial values and academia focuses on building new knowledge through research and education to students, the combination of industries and universities could accelerate breakthroughs. Benefits from industries are gained in the context of human capital, product and service innovation, improved business processes, revenue generation, and industrial market support.

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Influence of Corporate Information Transparency on Foreign Institutional Investors' Shareholding Behavior: Evidence from Public Listed Companies in China

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Abstract: In 2003, China implemented the Qualified Foreign Institutional Investor (QFII) system, which has garnered considerable interest from international institutional investors in the mainland market. As global investors, QFIIs depend significantly on precise, thorough information to bolster their investing criteria. Consequently, the transparency of corporate information becomes a crucial factor for QFIIs, as they prioritize well-disclosed information in their investment strategies. However, due to the relatively late development of the Chinese market, an imbalanced structure of listed companies, and information asymmetry, the information disclosure of listed companies has been subject to certain degrees of distortion. This can hinder the effectiveness of the QFII system. Therefore, to better facilitate the development of China's securities market and to help QFIIs fully realize their advanced value investment strategies, this paper aims to study the impact of corporate information transparency on the stockholding behavior of foreign institutional investors. This paper begins by reviewing the literature on the factors influencing institutional investor holdings, corporate transparency, and the characteristics of foreign institutional investors' stockholding. It then defines the concepts of corporate information transparency and foreign institutional investors, analyzes the current state of information transparency in Chinese listed companies, and examines the development of the QFII system in China. The theoretical framework explores the mechanisms through which corporate information transparency influences the stockholding behavior of foreign institutional investors. In the empirical analysis, the paper plans to measure the information transparency of listed companies from three perspectives: earnings quality, information ratings by the Shenzhen Stock Exchange, and the number of analyst followings, to investigate how corporate information transparency influences QFII stockholding behavior.

Keywords: *Corporate Information Transparency, Foreign Institutional Investors' Shareholding Behavior, QFII.*

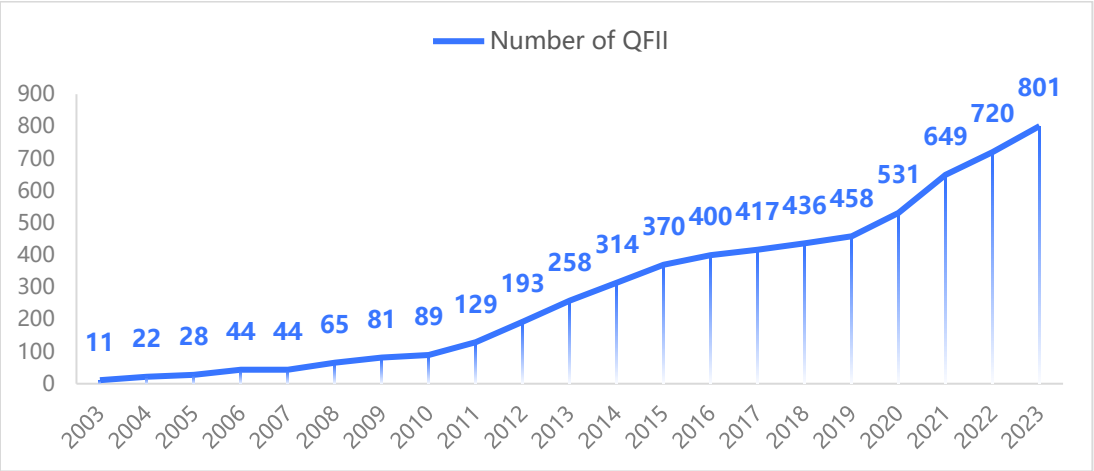
1. Introduction and Background

In response to the requirements of rapid economic growth, the coexistence of a weakened securities market, and the need to open China's capital account, the Qualified Foreign Institutional Investor (QFII) program was implemented in 2003 as a transitional measure in China's capital markets. It aimed to allow foreign institutional investors to participate in the domestic market. In July 2003, the Union Bank of Switzerland completed the first foreign investment in A-shares through the QFII program, signifying the official participation of QFII in China's securities market. Over the past 20 years, China's QFII system has undergone various stages of development, from its introduction and improvement to maturity, gradually emerging as one of the most important institutional arrangements in the Chinese capital market. As time passed, the QFII program gained popularity thanks to favorable policies and the bullish market conditions in China. By 2011, QFII accounted for 1.07 percent of the A-share market, with total assets reaching 265.5 billion yuan. In July 2012, the China Securities Regulatory Commission (CSRC) introduced new regulations that expanded the investment scope for QFII and raised the ownership limit from 20 percent to 30 percent. Subsequently, in January 2019, the State Administration of Foreign Exchange (SAFE) increased the QFII investment quota to $300 billion. In September 2019, the quota restrictions were eliminated, allowing QFII investors to operate without single-investment quotas and approvals. As of December 2021, a total of 670 institutions outside mainland China have obtained QFII qualifications, with QFII holdings amounting to 284 billion yuan.[1] As shown in Figure 1, as of 2023, the number of QFII has reached 801. It is important to note that the primary objective of the QFII program was to mitigate the impact of capital flows on the domestic market and promote efficient resource allocation. However, for the program to effectively achieve these goals, it is imperative to provide QFII investors with comprehensive

[1] https://www.news.cn/fortune/2022-08/25/c_1128944897.htm

and transparent company information to facilitate informed decision-making and investments.

Figure 1: The number of QFII from 2003 to 2023



Information disclosure bridges the gap between listed companies and the capital market. With the increasing number of institutional investors, including QFII, in the Chinese market, there is a growing demand for higher-quality information disclosure. These investors have evolved from passive recipients of disclosed information to actively participating in corporate governance. Therefore, the transparency of company information has become increasingly significant.

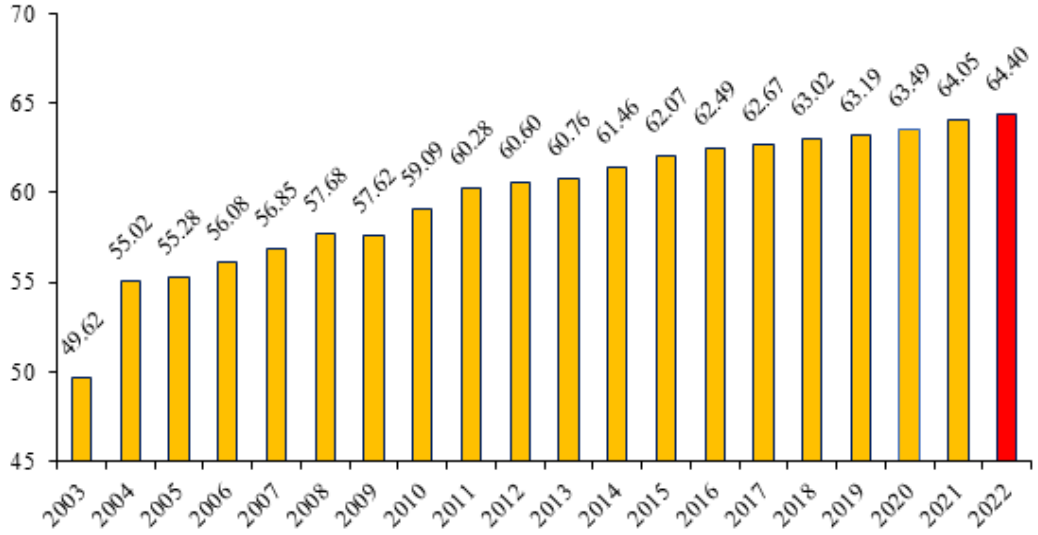
The market has developed rapidly in the 32 years since China's securities market was established. To regulate market behavior, China has successively promulgated laws and regulations such as the "Company Law" (1993), "Securities Law" (1998), "Interim Measures for the Administration of Stock Issuance and Trading" (1993), and "Corporate Governance Guidelines for Listed Companies" (2002). These legal frameworks have regulated corporate governance and corporate activities related to capital markets. Compliance with these regulatory arrangements is reflected externally through the financial information enterprises disclose. While improving corporate governance in China, these institutional arrangements can also be considered macro-level regulatory norms for information disclosure by listed companies, which is crucial for enhancing corporate information transparency.

Following the initial PricewaterhouseCoopers' opacity index survey, Kurtzman Group (2004) and the Milken Institute (2006 and 2008) conducted surveys evaluating opacity indices in various countries. These subsequent surveys expanded to include most developing countries and measured fundamental changes in these economies. These surveys revealed two important situations regarding China's overall transparency; over time, China's overall information environment has gradually improved. Between 2004 and 2009, China's opacity index decreased from 50 percent to 42 percent, and this improvement was primarily attributed to improvements in China's regulatory and legal environment and the implementation of specific audit requirements. Second, despite China's improved overall information environment, the 2009 survey results showed that China ranked 38th out of 48 countries regarding information transparency. Specifically focusing on accounting and financial reporting transparency, it can be observed that between 2004 and 2009, China made significant progress in the opacity score for "accounting and financial disclosure," decreasing from 56 percent to 40 percent. This improvement resulted from the overall global trend of increasing transparency over the past decade. Second, despite the decrease in the opacity index, China's 40 percent accounting opacity index in 2009 still ranked it the fourth-worst country among the 48 surveyed regarding accounting opacity. The three countries ranking below China were Colombia, Saudi Arabia, and Nigeria. In comparison, other major emerging economies had accounting opacity scores of 26 percent for Russia, 29 percent for India, and 36 percent for Brazil, while the opacity score for Hong Kong was as low as 1 percent (Piotroski and Wong, 2012) .

Since 2004, the Research Institute of Corporate Governance at Nankai University has constructed the Corporate Governance Index for Chinese Listed Companies based on the evaluation results of publicly disclosed information of listed companies, drawing upon relevant research findings. Among the components of this index

is the Information Disclosure Index for Chinese listed companies; as illustrated in Figure 2, from 2004 to 2022, the level of corporate governance in Chinese listed companies has steadily increased, with an overall improvement of 29.8 percent. This outcome indicates that the governance structure of Chinese listed companies has been largely established, and the current phase involves refining governance mechanisms and gradually enhancing governance effectiveness.

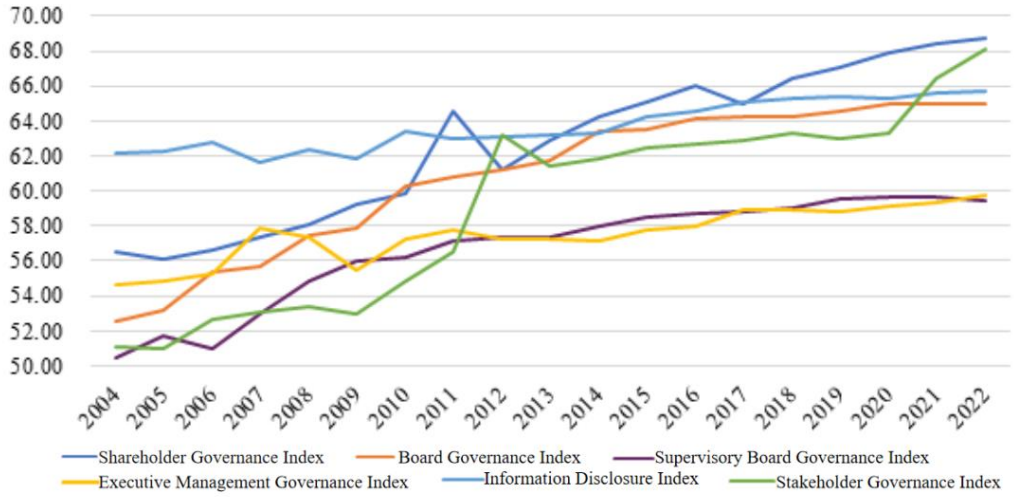
Figure 2: Trend of Corporate Governance Index from 2003 to 2022



Based on a 20-year evaluation spanning a cumulative sample of 46,982 companies, it is evident that the overall standard of corporate governance among listed entities has steadily advanced. Following the setback triggered by the 2008 financial crisis, the average corporate governance index of listed companies has shown a consistent annual increase, reaching a new pinnacle of 64.40 in 2022, marking a substantial 14.78-point surge from 49.62 in 2003. Over the past decade, privately held listed companies have outpaced their state-owned counterparts. State-owned listed firms must further incorporate market mechanisms, elevate their economic governance proficiency, and refine the distinctive modern Chinese corporate framework.

However, as depicted in Figure 3, the Information Disclosure Index has shown relatively slow growth compared to the other six sub-indices. In 2022, the mean disclosure index for Chinese listed companies stood at 65.74, marking a 0.14-point ascent from the previous year. Assessing the three disclosure sub-indices, the authenticity average stood at 65.37, relevance at 65.44, and timeliness at 67.08. Authenticity witnessed a 0.15-point upsurge, primarily driven by the heightened compliance costs from the December 2020 release of delisting regulations. This resulted in a reduction of 152 companies with non-standard audit opinions and an 8.79 percent decline in companies with anomalous profit margins. Relevance experienced a 0.25-point increase, chiefly attributable to a 69.78 percent surge in companies disclosing research and development investment information and an 11.04 percent rise in asset and liability composition disclosures. Conversely, timeliness registered a 0.07-point decline, largely due to adverse economic conditions, manifesting in a 20 percent increase in delayed annual reports from loss-making companies and a 2.37-fold surge in companies penalized for significant delays.

Figure 3: Trends of the six major sub-indices of corporate governance from 2004 to 2022



In summary, while China's information environment has improved over the years, the overall transparency, i.e., the level of information disclosure by Chinese listed companies, remains a cause for concern. Issues such as information distortion and insufficient regulatory enforcement continue to be the main challenges faced by the quality of information disclosure in China.

From existing literature on QFII research, scholars have delved into issues related to the QFII system (Bekaert & Harvey, 2001; Zeng, 2009), QFII shareholding and corporate governance (Gillan & Starks, 2003; Hartzell & Starks, 2003; Almazan, 2005; Luong, 2017; Lel, 2019), company performance (Sun & Lin, 2006; Ye, 2009; Tang & Song, 2010; Wang, Fang & Liu, 2013; Zeng & Zhu, 2019), and relationships with securities markets (Sun & Lin, 2006; Schuppli & Bohl, 2009; Rao, Xu, Mei & Liu, 2013; Sun, Pan & Li, 2017). The conclusions drawn from these studies are thorough and mature, reflecting the increasing attention given to QFII from external stakeholders and underscoring its growing role in driving capital market development.

In the realm of research exploring the relationship between corporate transparency and institutional investors, considerable discussions have taken place within the academic community. Prior studies show that when making global asset allocation decisions, foreign institutional investors consider the degree of corporate transparency shaped by country-level disclosure requirements and firm-level financial reporting choices (Aggarwal et al., 2005; Leuz et al., 2009). Domestically, scholars argue that the current information disclosure practices of listed companies in China fall short of meeting the requirements of institutional investors. Institutional investors necessitate comprehensive, timely, and reliable company information for their analyses and investments (Jiang 2004; Pan & Xin, 2004). Furthermore, scholars have identified that the proportion of institutional investors' holdings tends to increase with improved information transparency (Jiang, 2004; Hong & Fang, 2005; Lu, 2006; Gao, He & Huang, 2006). In international research, empirical studies have indicated that within the internal environment, foreign institutional investors are inclined to invest in companies characterized by high-quality accounting information, high information transparency, and robust corporate governance (Leuz et al., 2009; Bae & Goyal, 2010). Some scholars believe that the more transparent a company's information is, the higher the proportion of institutional investors holding its shares (Healy et al., 1999; Bushee & Noe, 2000). Aggarwal et al. (2005) found in her study of institutional investors in the United States that they tend to prefer holding stocks of listed companies with higher transparency levels. Manogna (2021) surveyed the Indian market, examining how corporations improve their transparency and corporate governance structure to attract foreign institutional investments.

In China's domestic research landscape, more research needs to explore the impact of corporate information transparency on QFII holding behaviors. Xin (2014) studied the investment style of QFIIs from multiple perspectives, including corporate liquidity, fundamental information, and historical operational performance.

The research found that QFIIs tend to hold stocks of listed companies with high transparency, high profitability, and low financial risk. Li (2018) found that QFII holdings significantly improve the quality of information disclosure by companies. Moreover, QFIIs can further enhance the quality of information disclosure by already well-governed companies by increasing the number of analysts tracking the company and by linking executive compensation to performance sensitivity. Zhao et. al. (2024) discovered a positive correlation between the proportion of independent institutional investors and the quality of information disclosure by listed companies. Interestingly, they found that as the proportion of non-independent institutional investors holding shares increases, the quality of information disclosure by listed companies tends to deteriorate. Zhou and Wang (2013) conducted a study indicating that foreign shareholders positively influence the quality of accounting information.

In domestic research, there needs to be more comparative analysis on the impact of corporate transparency on QFII shareholding behavior. When investing, QFIIs require access to complete and reliable market information. Only in markets with high transparency and where company information is fully disclosed can QFIIs effectively leverage their rich experience, advanced concepts, and mature technologies to inform investment. To summarize, scholars from both domestic and international contexts have conducted extensive research on the relationship and mutual influence between corporate transparency and institutional investors. This body of research confirms that institutional investors, characterized as more professional and rational, rely heavily on a wealth of objective company data, including annual reports and securities analyst data when conducting market analyses. Additionally, it affirms that enhancing corporate information transparency encourages institutional investors to amplify their investments. However, the existing literature often concentrates on comprehensive studies of institutional investors, with limited dedicated analysis specifically for QFII. Recognizing the significant differences between QFII and other types of investment institutions, it is inappropriate to make sweeping generalizations. QFII, as a globally recognized investment institution, adheres to the principle of value growth. Moreover, due to regional distinctions, QFII is less susceptible to the country's policies where the invested enterprises are located. From the perspective of QFII, there is a compelling need for a distinct study (Wei, 2021).

This article seeks to draw inspiration from foreign literature and, within the institutional framework of China, examine the influence of corporate information transparency on QFII investment behavior.

2. Literature Review

Influencing Factors of Institutional Investor Shareholding: Over the past few decades, foreign securities markets' rapid growth and maturation have created an optimal investment environment for institutional investors. As of 2003, statistics reveal that the assets of institutional investors in developed countries, primarily the United States and the United Kingdom, have surpassed their respective GDP. In mature markets, institutional investors from developed countries account for over 70% of the market share. Consequently, foreign scholars have conducted extensive and mature research on institutional investors, examining the preferences and influencing factors affecting institutional investor shareholdings.

Foreign scholars have identified key characteristics that attract institutional investors, such as companies with robust profitability (Badrinath et. al, 1989), low stock price volatility, and a lengthy listing period (Gompers & Metrick, 2001). Additionally, research on fund shareholding has shown that funds exhibit distinct preferences, favoring stocks of listed companies with high-quality information disclosure and strong liquidity (Falkenstein, 1996). Empirical studies have further analyzed characteristics of fund shareholding, considering factors like stock quality, company size, establishment duration, stock liquidity, and earnings quality, all of which vary based on the distinctive features of different institutional investors (Del Guercio, 1996). Besides these characteristics, institutional investors' preferences are also influenced by a company's reputation, which favors reputable companies with high dividend payments and attention to forecasted earnings standard deviation (Eakins et. al, 1998).

While foreign research has extensively explored institutional investor preferences and influencing factors, the domestic landscape in China, with the introduction of the QFII system in 2003, is still evolving. Domestic scholars have primarily focused on examining the influencing factors of fund shareholding, finding significant

impacts from characteristics such as earnings per share, net assets, stock volatility, stock price, stock turnover rate, company profitability, and internal governance (Wang & Xiao, 2005; Hu & Wu, 2004; Hu et al., 2024; Song et al., 2013). Notably, domestic scholars have also highlighted institutional investors' preference for stocks with high information transparency, emphasizing that institutional investors tend to favor companies with transparent information and selectively avoid companies with characteristics such as high risk, complex management structures, and high insider ownership ratios.

Shareholding Preference of Foreign Institutional Investors: Since introducing the QFII system in China in 2003, marking the allowance of overseas investors to engage in the stock market under certain conditions, QFII has evolved into an indispensable participant in the Chinese market. With several increases in QFII investment quotas, the growing number of QFII participants and the substantial funds they bring have made them integral players in the domestic market. QFII, as a foreign institutional investor in the Chinese context, possesses a lengthy investment history and diverse investment methods, with activities spanning global financial markets. Consequently, the investment preferences of QFII have garnered attention from scholars both domestically and internationally. Existing literature reveals two primary approaches in foreign research on QFII.

The first approach empirically tests QFII investment preferences using data from foreign institutional investors in specific financial markets. Scholars examine factors influencing foreign institutional investor shareholdings by analyzing data on their holdings in a particular financial market during a specific time frame. For example, studies on the Japanese market found that foreign institutional investors tend to favor companies with high market capitalization, low financial leverage, and high accounting quality (Kang, Stulz, 1997). Similarly, research on the Swedish stock market suggests that foreign investors are interested in internationally recognized, large-scale companies, showing reluctance to invest in companies where the largest shareholder holds absolute controlling power (Dahlquist et al., 2003). Comparative studies between different markets, such as Japan and Korea, have also yielded similar conclusions, with foreign investors showing a preference for stocks with larger market capitalization and lower book-to-market ratios (Ko et al., 2007).

The second approach primarily focuses on studying the investment preferences of institutional investors from developed countries (e.g., the United States) in foreign markets. This type of research emphasizes the impact of the external environment in foreign markets on investor protection (mainly legal protection) and the influence of corporate information disclosure quality on foreign investor investments. Scholars have found that due to information asymmetry, foreign investors prefer to invest in locally headquartered companies (Coval, Moskowitz, 1999).

In comparison, since the introduction of the Qualified Foreign Institutional Investor (QFII) system in China, domestic research has primarily focused on the impact of the QFII system on the Chinese market, comparing the QFII system domestically and internationally and addressing potential challenges posed by QFII. Additionally, studies on QFII investment preferences within the domestic academic community have mostly relied on qualitative analyses. These studies have found that QFII-held stocks exhibit stable performance, strong profitability, and the ability of QFII to adjust based on economic and industry cycles, showcasing remarkable industry insights (Sun and Lin, 2006). Liu, Bredin and Cao (2020) investigate the dynamic investment preference of QFIIs. The results indicate that total QFIIs prefer more recognized firms with low liability levels, large size, high turnover ability, and state-owned.

Existing studies on foreign institutional investors' investment preference, the home bias hypothesis argues that foreign investors have less local knowledge than domestic investors (Kang & Stulz, 1997; Huang & Shi, 2013; Liu et al., 2020; Roque & Cortez, 2014; Zhou et al., 2019; Ferreira et al., 2017). To overcome this issue, foreign institutional investors prefer to invest in firms with a more transparent information environment (Chou et al., 2014), a good corporate governance structure (Chung & Zhang, 2011; Miletkov et al., 2014; McCahery et al., 2016), firms located in countries with stronger investor protection (Aggarwal et al., 2005), or with higher levels of social trust (Jin et al., 2016). Besides, foreign investors will choose a concentrated investment strategy to reduce information processing costs (Kang & Stulz, 1997; Fedenia et al., 2013; Liu et al., 2020).

Empirical studies on Corporate Information Transparency: Corporate information transparency encompasses mandatory disclosures stipulated by regulations and voluntary disclosures by the company. A

comprehensive analysis of these aspects is essential to accurately reflect the company's transparency. Research on corporate transparency has been a focal point in the study of corporate governance, primarily examining the factors influencing information transparency and the economic consequences of corporate disclosures.

International research studies have focused on both external and internal factors. At the national level, scholars have found that cultural factors such as national hierarchies and risk tolerance (Gray & Vint, 1995), legal systems (Jaggi, Low, 2000; Hope, 2003), and foreign trade (Khanna, Palepu, et al., 2004) influence corporate disclosures. In studies comparing accounting information across different countries, it has been observed that in common law countries, the resolution of accounting information asymmetry through open and timely disclosures is key to the robustness of accounting information compared to civil law countries (Ball, Kothari, et al., 2000). Ball et al. (2016) found that the accounting policy environment impacts the quality of information transparency.

At the corporate level, empirical studies have revealed that companies disclose information around six months before issuing stock (Lang & Lundholm, 2000) and focus on revealing management earnings forecasts during mergers and acquisitions (Brennan, 1999). Characteristics such as corporate governance structures and disclosure motivations have also been identified as influencing transparency. Armstrong et al. (2018) suggest that companies can moderately adjust their information transparency, with factors such as financial leverage, whether the company is listed overseas (Hossain, Perera, et al., 1995), and the nature of shareholders (Chen & Jaggi, 2000) affecting corporate disclosures.

In Chinese domestic research, Chinese scholars have primarily focused on the impact of internal corporate governance on information transparency. Studies have found that the quality of voluntary disclosures is influenced by factors such as the ownership concentration of the top ten shareholders, the presence of institutional investors among shareholders (Cui, 2018), CEO duality (Cui, 2018), whether the company issues H shares (Wang & Jiang, 2004), earnings performance (Fan et al., 2014), and the effectiveness of the board of directors (Sun & Zhu, 2014). They also assert that changes in regulatory policies affect the quality of corporate disclosures (Li & Liu, 2018). The potential avenues for improving transparency in listed companies through capital market openness are influenced by external judicial efficiency and optimization of internal corporate governance (Kassi, Li & Dong, 2023). Based on the implementation of the investor field research system by the Shenzhen Stock Exchange, Lin & Ding (2024) found that institutional investor field research improves the financial information quality of listed companies in the current and subsequent years, with higher research convenience enhancing this effect.

Furthermore, studies on the disclosure levels of companies with different ownership structures reveal that state-owned enterprises have better disclosure quality than non-state-owned enterprises. Still, foreign-controlled companies have higher disclosure levels than state-owned enterprises. Among the domestic market, foreign-controlled companies exhibit the highest level of information disclosure (Zhang et al., 2016). In summary, Chinese scholars have predominantly used earnings quality to study and analyze the voluntary information disclosures of listed companies and have yet to explore corporate transparency comprehensively.

Earnings Quality and Foreign Institutional Investors' Shareholding: The quality of a company's earnings is closely related to information asymmetry in the market. Earnings quality is one indicator for assessing corporate information transparency and disclosure quality. Research has shown that if the bid-ask spread is used to measure the degree of information asymmetry among investors, companies ranked in the bottom third for information disclosure quality have bid-ask spreads approximately 50 percent higher than those ranked in the top third (Welker, 1995). This suggests that the poorer the quality of information disclosure under corporate management's manipulation, the lower the information transparency. Therefore, the quality of earnings, as an aspect affecting disclosure quality, can also lead to information asymmetry driven by insider trading, a point supported by many scholars. For instance, Dye (1988) analyzed both internal and external demands for earnings management and concluded that information asymmetry between managers and investors perpetuates earnings management behavior.

Moreover, earnings management exacerbates information asymmetry (Richardson, 1997). Improving the quality of information disclosure can reduce the likelihood of mispricing by investors (Bushman et al., 2004).

Studies by Ascioglu (2012) and Bhattacharya et al. (2012) have also explored the relationship between accrual earnings and information asymmetry.

Using data from the Chinese stock market, Zhang (2024) found that lower earnings quality is also associated with higher degrees of information asymmetry in China. With the development of the PI indicator to measure the probability of informed trading, some scholars have incorporated informed trading into their research. Brown and Hillegeist (2007) argued that companies with higher information disclosure quality attract more uninformed traders, reducing the probability of informed trading. Jayaraman (2008), using the PIN indicator to measure informed trading and corporate earnings volatility and cash volatility to measure earnings quality, found that when earnings volatility exceeds cash flow volatility, there is more informed trading, leading to higher information asymmetry. Some scholars have studied the mechanisms behind this relationship. Kim and Verrecchia (1994) discovered that experienced investors have a greater information advantage over companies with poorer earnings quality, exacerbating market information asymmetry. Brown and Hillegeist (2007) believed that higher information disclosure quality could deter investors from actively acquiring private information and reduce the likelihood of informed traders using private information, thereby decreasing information asymmetry. Bhattacharya et al. (2012) found that companies with low earnings quality face higher adverse selection risks and more pronounced information asymmetry, with uninformed traders at a greater disadvantage. Bhattacharya et al. (2012) found that both bid-ask spreads and the PIN indicator negatively correlate with accrual quality, impacting the cost of equity capital. When accrual quality declines, information risk rises, and the cost of equity capital increases. Scholars generally agree on the relationship between earnings quality and market information asymmetry. Regardless of the proxies used or the focus on mechanisms, the consensus is that lower earnings quality increases investor information asymmetry. Thus, higher earnings quality correlates with greater corporate information transparency.

Considering the above analysis, combined with the definition of corporate information transparency, scholars include information about listed companies accessible to external users, such as annual reports and mandatory and voluntary disclosures reflecting company characteristics (Bushman et al., 2004). The most direct basis for QFIIs to judge a company's profitability is the financial condition reflected in the company's public financial statements. High-quality financial reporting indicates good information disclosure quality. In asymmetric information markets, Biddle et al. (2009) posited that accounting information plays a role in reducing information asymmetry, as asymmetric information in the securities market allows company managers or external investors to profit more from selling or buying stocks. However, company managers' comprehensive and effective disclosure of internal information prevents external investors from paying more than the stock's value. Based on the principal-agent problem, effective oversight mechanisms can avoid agency issues, and Biddle demonstrated that high-quality accounting information forms such an effective oversight mechanism.

Their research shows that improving the quality of accounting information disclosure effectively reduces information asymmetry between companies and external investors, alleviates principal-agent problems, reduces investor oversight costs, and enhances investment efficiency. Companies with high-quality earnings typically exhibit characteristics such as consistent and robust accounting policies, appropriate levels of corporate debt, and predictable future earnings. As earnings quality, serving as a channel of information that satisfies both corporate self-interest and the interests of stakeholders centered around investors, increases, its impact on corporate management and investment analysis also grows. Li, Wang, Wu, and Zhou (2021) investigated the influence of QFIIs on internal control quality in China. Their study sheds light on how foreign institutional investors can impact internal control quality, closely related to earnings quality. This suggests that the presence of QFIIs may affect the overall quality of financial reporting in a given market. Overall, these studies underscore the significance of earnings quality in attracting and retaining foreign institutional investors. By enhancing transparency, monitoring earnings management practices, and improving internal control quality, companies can potentially increase their appeal to foreign investors and strengthen their position in the global market (Al-Duais et al., 2022; Lee, 2021; Li et al., 2021). Hence, this study proposes the following proposition:

P1: The higher the company's earnings quality, i.e., the higher the quality of the financial statements and the greater the corporate information transparency, the higher the proportion of foreign institutional investor holdings.

Disclosure Score and Foreign Institutional Investors' Shareholding: In the Chinese mainland market, the Shenzhen Stock Exchange and the Shanghai Stock Exchange have been rating the information disclosure of all listed companies on their exchanges since 2002, according to the "Listed Company Information Disclosure Evaluation Method." The stock exchanges assess the quality of listed companies' information disclosure from various angles, checking if the disclosure is timely, accurately reflects the company's operational status, is comprehensive and complies with relevant laws and regulations. They also integrate the company's daily operations and trading behaviors for a thorough evaluation, categorizing the quality of information disclosure into grades: fail, pass, good, and excellent. The results of the information disclosure ratings are then published on the Shenzhen Stock Exchange website for market reference, further encouraging listed companies to value transparency and improve their information disclosure quality. The rating by the Shenzhen Stock Exchange has evolved from a general description to a specific grading, distinguishing companies with "excellent" information transparency from those with "fail" quality disclosure.
According to Healy, Hutton, and Palepu et al. (2001), the higher a company's information transparency, the more it can attract institutional investors' attention, leading to more investors willing to invest in it. Therefore, the investment of QFIIs in the mainland market is no exception, and this study proposes:
P2: The higher the company's information disclosure rating, i.e., the greater the corporate information transparency, the higher the proportion of foreign institutional investor holdings.

Analyst Following and Foreign Institutional Investors' Shareholding: Analysts serve as vital information intermediaries in capital markets, deeply engaged in the collection, processing, and dissemination of information. Analysts provide professional earnings forecasts and investment recommendation reports by thoroughly investigating companies' private information, reflecting the intrinsic value of securities to the capital markets. This process helps mitigate information asymmetry and enhances transparency.

Lang et al. (2012), through a study of FAF's historical data from 1985-1989, derived the relationship between company researchers and information disclosure. Their findings indicate that researchers tend to follow companies with comprehensive information disclosure. As a result, their forecasts for these companies are more accurate, and the discrepancies among different researchers' earnings forecasts are smaller. This implies a complementary relationship between the number of analysts and the transparency of a company's information. Better information transparency attracts more analysts, reduces information asymmetry between company management and investors, and lowers the information risk, thereby reducing the risk premium required by investors and increasing the value of the listed company. Jegadeesh and Kim (2006) found that analysts possess more professional analysis capabilities regarding listed companies, enabling them to make more accurate judgments about company information, thus enhancing the depth and quantity of information available to investors. Roychowdhury (2010) concluded that increased analyst attention and tracking can improve internal competition within company management, expanding the breadth and depth of information available to investors. Lang and Lundholm (2000) defined the transparency of a listed company's information environment by the number of analysts tracking the company and the accuracy of earnings forecasts. The accuracy of analysts' earnings forecasts is measured by the absolute difference between the median EPS forecast for the year and the actual EPS, then subtracting this value from the company's stock price. A larger value indicates lower forecast accuracy and lower information transparency.

Bai et al. (2009) examined the impact of company information disclosure policies on the quantity and quality of analyst forecasts, finding that greater transparency leads to more analysts following the company, more accurate earnings forecasts, and smaller discrepancies. Li (2012) used information disclosure evaluation indicators from the Shenzhen Stock Exchange to measure company transparency, discovering that higher transparency attracts more analyst attention. However, more is needed to improve company transparency significantly. Zhou and Wang (2013) posited that analysts can accurately interpret and transmit information released by company spokespeople, thereby enhancing company transparency. Li et al. (2018) found that QFII holdings significantly improve the quality of corporate information disclosure by attracting more analyst attention and increasing earnings sensitivity. The effect is more pronounced when the internal corporate governance and audit quality are higher.

As early as 1990, O'Brien and Bhushan found in their study of institutional investors that companies tracked by more analysts attract more institutional investment. Relevant studies in the U.S. market have also confirmed

this view, with Roulstone (2015) and Kepler et al. (2024) presenting mixed evidence on the relationship between components of transparency (such as voluntary information disclosure) and analyst tracking and liquidity. Besides company-initiated disclosures, standardized accounting principles, and auditor choices, information from intermediary institutions likely affects transparency. Analysts collect and aggregate information from public and private channels to evaluate company value, enhancing overall market transparency (Brennan & Subrahmanyam, 1995; Lang & Lundholm, 2000; Lang et al., 2012). Further research found that analysts, as an external governance mechanism reducing information asymmetry, can lower a company's earnings management (Yu, 2008; Knyazeva et al., 2015) and enhance transparency (Lang et al., 2012).

Domestic scholars have also proven that analysts' presence reduces information asymmetry in the capital market (Xu et al., 2010). Thus, for QFIIs, apart from publicly available annual reports for information, they often rely on analyst reports to gather data on company growth and development. The level of analyst attention to a company also reflects its information transparency to some extent. Based on this, this study proposes:
P3: The greater the number of analysts tracking a company, i.e., the higher the corporate information transparency, the higher the proportion of foreign institutional investor holdings.

3. Research Methodology

The sample for this study consists of Chinese A-share listed companies from 2013 to 2023. Data for this study were sourced from the CSMAR, Choice, and Ruisi databases. Additionally, information such as the rating of listed companies on the Shenzhen Stock Exchange was obtained from the Shenzhen Stock Exchange website and manually collected and organized.

Variable Setting: The variable setting is shown in Table 1.

Table 1: Variable setting

Variable type	Name	Symbol	Description
Dependent variable	QFII's shareholding	QHP	The proportion of shares held by foreign institutional investors
Independent variable	Earnings Quality	DD	Using a model adjusted by Francis et al. (2005) based on the Dechow and Dichev (2002) model
	Disclosure Score	DSCORE	The disclosure score issued by the Shenzhen Stock Exchange for companies listed on its exchange
	Analyst Following	ANALYST	The count of analysts forecasting the annual earnings of the company from the disclosure date of the previous year's annual report to the disclosure date of the current year's annual report
Control Variable	Stock Turnover Rate	TUR	Annual Trading Volume / Annual Total Number of Outstanding Shares
	Company Size	SIZE	Natural Logarithm of Total Assets at Year-End
	Leverage Ratio	LEV	Total Liabilities / Total Assets
	Book-to-Market Ratio	BP	Book Value of Equity / Market Value of Equity
	Revenue Growth Rate	GROW	(Current Year Operating Revenue - Previous Year Operating Revenue) / Previous Year Operating Revenue

Model: This study examines the impact of information transparency on the holdings of foreign institutional

investors. Following and referencing the model proposed by Bushee (2001), various measures of information transparency are utilized to investigate its effect on foreign institutional investor holdings.

$$QHP_t = a_0 + a_1 TRANSPARENCY_t + a_2 TUR_t + a_3 SIZE_t + a_4 LEV_t + a_5 BP_t + a_6 GROW_t + INDUSTRY + YEAR + e_t$$

In the regression model, TRANSPARENCY represents the measure of information transparency, which includes the previously mentioned indicators of earnings quality (DD), Shenzhen Stock Exchange rating (DSCORE), and analyst coverage (ANALYST).

Descriptive Statistical Analysis: Descriptive statistical analysis will be applied in this study. Observations of key variables in the sample, maximum, minimum, median, mean, skewness, kurtosis, and standard deviation, are all applied in descriptive statistical analysis. Descriptive statistical analysis can analyze whether the sample data is normally distributed and provide descriptive analysis for subsequent analysis.

Correlation Analysis: This study should conduct a Pearson correlation analysis on the model to preliminarily verify the hypothesis. If the correlation coefficients are all within 0.5, it can be assumed that there is no serious multicollinearity. However, if the coefficients are relatively high, a tolerance and variance inflation factor (VIF) analysis should be performed to assess whether the model has multicollinearity issues. In the VIF test, if the VIF values are less than 10 and their tolerance (1/VIF) values are greater than 0.4, it can be concluded that including control variables does not cause serious multicollinearity. Otherwise, multicollinearity is present.

Robustness Test: To verify the robustness of the conclusions, this study plans to use the Heckman two-step method to address data missingness and endogeneity issues. The Heckman two-step method, also known as the Heckman correction, is a statistical technique used to correct for sample selection bias. This method is often applied in econometrics when the sample is not randomly selected, leading to biased estimates. If the coefficient of the IMR (lambda) is statistically significant, it indicates the presence of sample selection bias. This means the selection process affects the outcome variable, and the Heckman correction is necessary. If lambda is insignificant, it suggests that sample selection bias may not be a concern, and ordinary least squares (OLS) regression might suffice.

Endogeneity Analysis: This study plans to use the GMM model to solve the endogeneity of independent variables, lag variables' timing, and individuals' specificity.

4. Conclusion

The research objectives of this paper are to examine the impact of corporate information transparency (earnings quality, disclosure score, analyst following) on QFII's shareholding behavior of publicly listed companies in China. The expected outcome of this paper is that the higher the company's information transparency, the greater the number of shares held by foreign institutional investors. This paper delves into the relationship between QFII shareholding behavior and corporate information transparency, specifically focusing on analyzing QFII to fill the gap in previous research regarding the relationship between corporate information transparency and institutional investors' investment behavior. Thus, this paper's findings will inform regulatory policies and promote corporate governance. Understanding the impact of transparency on foreign shareholding can guide regulators in making more informed decisions on disclosure requirements and investor protection, thereby enhancing market transparency and attractiveness. Findings may encourage companies to improve governance and disclosure practices, as increased transparency could attract more QFII investments, boosting their international competitiveness and market image.

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Multivariate Regression Analysis of the Impact of Open Market Share Repurchase Activity on the Malaysian Market

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Abstract: This research thesis revolves around the need to understand the relationship between share repurchases and the share price behavior of companies listed on Bursa Malaysia on a more recent basis given the economic stability in Malaysia and throughout the world from 2017 to 2021. It started in the West and reached maturity in the 1980s in the United States, but it only began in Malaysia in the 1990s. The studies of share repurchase are still considered an infant in Malaysia as in other countries throughout the world, companies pursue share repurchases for several reasons mainly to signal undervaluation, reward shareholders, defend against the takeover, utilize financial resources efficiently, and many more motives that are interesting for researchers to look at. Unlike other studies that look at announcement dates, since an announcement does not mean the companies will implement the transactions, this research is important since it looks at and analyzes the actual effective repurchase day done by established firms which is are most crucial aspect in analyzing the consequences and the results are that it shows positive abnormal mean returns for most of the companies. Event study methodology was used since this is the bestempirical research method and as empirical evidence to analyze abnormal returns from all the other studies. The days observed are 120 days before and after the announcement. Returns for the estimation window, event window (repurchase day), and post-event window were analyzed to see the effects of price movementon repurchase activities at Bursa Malaysia (BSKL).

Keywords: *Share Repurchase, Signaling Theory, Dividend, Tax, Market Capitalization.*

1. Introduction and Background

Since limited studies have been done on share buybacks in Bursa Malaysia, this study intends to provide additional inside information on this practice. This study was undertaken because of eagerness to know more about the true financial and economic significance of share buybacks. The objectives of this study were: To investigate the effects of share buybacks on share prices and the related risks in the short run before, at, and after share buybacks. Financial theorists subscribe to several hypotheses and theories to explain the motivations for share buyback programs. Investigating the determinant and relationship of the share buyback volume with other financial variables from the financial reports and the financial characteristics of firms reveals the motivation for undertaking the share buyback program. The study investigates which testable hypothesis, out of all mentioned in the literature review, significantly contributes to share repurchases within the Malaysian context. The two objectives are generalization out of all the data collected. In generalization, individual effects on firms are ignored or averaged out. Therefore, using event studies and Multivariate Regression Analysis output produced from the regression analysis, this study intends to forecast future share prices. In short, the research objectives can be summarized as follows:

- To examine and test the explanations of share repurchases within Bursa Malaysia
- To investigate the effect of share buybacks on share prices (t-Test)
- To identify the change in risk in the short run before, at, and after share buybacks
- To predict the share price of a firm undertaking share repurchase programmed.

2. Literature Review

Analyses of market reactions are made based on the company listed in Bursa Malaysia which is the main market. At BSKL, the main board and second board have been combined since 2009 and it will create a milestone in the development of the market for fund-raising firms in Malaysia. The new framework as wellas the new board structure will enhance the attractiveness of Bursa Malaysia as a listing destination, providing efficient access to capital and investments." Under the new framework, rules, and processes forequity fund-raising have been streamlined to provide greater certainty, shorter time to market, and lower regulatory costs.

Often, these mean certain flexibilities have been introduced. For example, only certain substantive corporate proposals will require the SC's approval under Section 212 of the Capital Markets and Services Act. There are known to be numerous reasons why firms deploy capital. For this research, firms have two alternatives for deploying capital. The first is by reinvesting in the business via mergers and acquisitions, capital expenditures, and working capital, or the second is by returning capital to shareholders through dividends and share repurchases. As suggested by Asquith and Mullins (1986), returning capital to shareholders with differing cash payout policies presents one of the most puzzling and disturbing issuesin corporate finance, especially when share Repurchase programs have now become increasingly more popular this day than the traditional dividend payout as a form of cash distribution to shareholders.

In this research, the companies I analyzed have an annual turnover excess of RM100 million and above. The pre-announcement price is lower as compared to effective repurchase dates. This shows that after repurchasing, the stocks are overvalued. It also shows the signaling effect that the companies have excess cash to be distributed. Hence it motivates outsiders to buy stocks in the companies which will further strengthen the price of the shares. Therefore, this study supports the signaling hypothesis. However,this signaling hypothesis is controversial because open market repurchases are not costly signals as they do not commit the firm to buy back their shares. Moreover, there is a distinction between signaling management's expectation of future increases in the firm's cash flow and earnings and signaling disagreement with the current market valuation of the firm's performance. This is the reason why this study investigates the actual effective repurchase days. It is that while these twoviews are consistent with undervaluation, the former suggests that the firm is unable to communicate to the market about its prospects, meanwhile, later they imply that the market is inefficient because the current prices do not reflect publicly available enough information. This latter view is also supported bythe findings that the market is under-reaction. For example, Ikenberry et al (1995) analyzed a large sample of US open market repurchase programs that were announced in the 1980s that reported significant positive abnormal returns of 12% in the four years following stock repurchases. This suggests that the markets fail to impound information in stock prices quickly. The basis of the signaling explanations is that a firm's management has better information about the company's true value than outside investors.

In Malaysia, Section 365 of the Companies Act 1965, stipulates that no dividend shall be payable to the shareholders of any company except out of profits. The term "profits" however is not defined in the Act. Nevertheless, The Malaysian Accounting Standard Board (MASB)'s framework for the preparation and presentation of financial statements defines profit as the residual amount that remains after expenses (including capital maintenance adjustments where appropriate) have been deducted from income. Any amount over and above that is required to maintain the capital at the beginning of the period is profit. In summary, the accounting term "profit" is not just limited to profit that has been realized. It also includes profit that has not been realized. Corporate finance theories dictate that managers' (agents) decisions should lead to value maximization for the firms' shareholders' principles. When a firm has excess cash flow, managers must choose among several alternatives to deploy the cash to add value to the firm. In the absence of profitable investment or debt reduction, they must choose the best method to pay out the excess cash flow to the shareholders to avoid agency conflict. The principal mechanism used by the firm's payout methods to shareholders may include share repurchases and dividends.

In Malaysia in 2015, 36 repurchasing firms implemented share repurchase programs and this grew to 149 firms in 2018. In addition, in 2015, the share repurchase volume was 119.913 million shares, and this grewto approximately 6.258 billion shares in 2018. Malaysia practices the overnight market rates as stipulated by Bursa Malaysia's Chapter 12 Share Buy-backs Listing Requirements, which allows only the OMR option where repurchases must only be affected on the market of the exchange. "On the market" refers to transactions that are to be made through the Automated Trading System of Bursa Malaysia and excludes any formsof direct business transactions. In Malaysia, dividend income received is chargeable under the Income Tax.

Act and it falls under two separate computations that is Imputation System and under Single tier System. Dividends are received under the imputation system; taxes paid by companies are not final taxes. Taxes paid by companies are passed on to shareholders as tax credits where shareholders received dividends have been tax deducted as source (e.g.25%) and received a net dividend (e.g. 75%). Here, taxpayers are required to declare gross dividend income (100%) in the income tax return. If the taxpayer is in the lower tax bracket

(e.g.19%), then the taxpayer is entitled to a refund of 6%. On the other hand, if the taxpayer is in the tax bracket of 27%, the taxpayer is required to pay a 2% additional tax on the gross dividend received. The announcement by a publicly owned firm to buy back some of its shares in the open market is generally perceived as a strong positive signal. Furthermore, the information of the signaling hypothesis will predict that the firms use their share buybacks as a vehicle to signal new and positive information about their future earnings prospects. Studies have observed that the common stock of such firms tends to experience an immediate 3.5% average abnormal return as well as a 12% average abnormal return during the longer-term period of 4 years following the announcement. Studies have also observed that both short and long-term returns have wide variations upon the close investigation through the empirical research. The requirement of publicly owned firms in Malaysia to report basic EPS and diluted EPS to follow federal regulations and generally accepted accounting principles (GAAP) contributed to firms paying close attention to earnings when measured as basic earnings per share (EPS), as well as diluted EPS. Several studies observed that diluted EPS was more highly associated with stock prices than basic EPS because it suggests that diluted EPS had more credibility with investors as a measure of financial performance. Since firms have flexibility on when to repurchase shares and the expected effectof repurchase is to increase diluted EPS, the study focused on whether the firms repurchased shares to manage diluted EPS with the dilutive effect of ESO plans. Their findings came from a sample of S&P 500 Industrial firms from 1996 through 1999. They observed that the stock repurchase decisions, when they announced, are affected by managers' intentions to manage diluted EPS and that firms increased their repurchases when earnings, it is measured as diluted EPS fell short of the level required to maintain the previous growth rate of diluted EPS.

Malaysia provides an excellent setting to investigate the relationship between dividend payment and repurchase as the corporate ownership structure is characterized as concentrated in nature Dividends can also minimize agency conflicts by subjecting companies to the scrutiny of capital market monitoring. Based on the free cash flow hypothesis, Jensen (1986) suggests that high payment of dividends could limit the cash available for managers. Therefore, managers' investment in uneconomic projects or wastage of perquisites can be minimized. Evidence shows that companies pay lower dividends when managerial shareholding in companies is relatively high. Dividends and share repurchases also play a significant role in controlling possible agency conflicts for firms in Malaysia the trend of the dividend payout ratio in Malaysiahas been increasing during the period under review from 2010 - 2017. The dividend payout ratio increasedfrom 21.71 percent in 2010 to 27 percent in 2017. The average dividend payout slightly decreased in 2015 and 2016 but increased substantially in 2018. However, according to the results of this research, empirically after repurchasing, the level of dividend payment had decreased tremendously. I conclude probably the directors and management had probably used all the capital to repurchase shares and this reductionin dividend payment will be compensated with higher share prices 60 days after repurchases, where shareholders are willing to sell their shares for capital gains.

3. Methodology

In this research, I will employ the event study method and Multiple Linear Regression. In multiple linear regression, I will use eight (8) variables that have a strong impact on share buyback. The variables are earnings, cash flow, book value, net income, price-to-book ratio, dividend, effective tax rate, and cash flow toequity. The reasons that I use Event Studies, their advantages, and their significant effects are that they measure the effects of an economic event on the value of firms. Using financial market data, an event study measures theimpact of a specific event on the value of a firm. The usefulness of such a study comes from the fact that, given rationality in the marketplace The effects of an event will be reflected immediately in security prices. Thus, a measure of the event's economic impact can be constructed using security prices observed over a relatively short period. In most applications, the focus is the effect of an event on the price of a particular class of securities of the firm, most often common stock. The event study method has become popular.

Because it obviates the need to analyze accounting-based measures of profit, which have been criticized because they are often not very good indicators of the true performance of firms. For example, managers can manipulate accounting profits because they can select accounting procedures. Stock prices, on the other hand, are not subject to manipulation by insiders. Stock prices are supposed to reflect the true value of the firms.

This study investigates eight variables being analyzed, that is Earnings, Book Value, Price to Book Ratio, Dividend, Effective Tax Rate, Cash Flow, Net Income, and Cash Flow to Equity. These ratios are taken since they

play a significant role in the decisions to Repurchase by Management and Directors. Anychanges in the variable will have a great impact on the changes in the companies' stock price and decision-making by management. It also does have an impact on the agency cost respectively in the Malaysian context being analyzed. This study investigates two analyses. The first will be the Event Studies being done. Myresults in this study are consistent with the signaling hypothesis and with most of the previous studies such as Chan et.al (2004). The market will interpret a firm's decision to repurchase its shares as a positive signal. It can also be interpreted from the results that the management deliberately timed their repurchase after a period of declining prices. My results show that, if correctly used, share repurchase may become an effective tool for stock price stabilization of the particular companies doing the repurchases. But for this to be effective, management must constantly be aware of the stock price movement and must be in line with the directors'instinct and intuition of when is the right time to make repurchases. The second part of the study looks at the impact of the eight variables on share repurchases.

The variables taken are after thorough and careful research of the impact the variables have on share repurchase. This study has a significant advantage sinceit examines share price reactions surrounding the actual share repurchases of companies listed on the Malaysian Stock Market for the period 2017 – 2021. This study takes 109 companies that are listed atBursa Malaysia Kuala Lumpur (BSKL) which previously was known as the Kuala Lumpur Stock Exchange (KLSE). The companies are taken on a random basis, and they are a mixture of different sectors of the economy. The different sectors of stock taken is to ensure there exists no bias of results from one particular sector only. The stocks taken for analysis are stable matured companies with a market capitalization above RM300,000 million annually. Analysis of the market reactions is also made based onthe board of listings. The study is different from Lim and Bacha (2002) in two respects. First, my period ofstudy starts from where their study ends. Hence, I utilize a more recent set of data. Second, this study focuses on the actual effective repurchase date executed by the firm as opposed to the announcement of approval for repurchase. This is very important as it shows effectively the actual results as compared to. Also, in Malaysia and throughout the world, a proposed repurchase doesn't mean that an actual repurchase will be undertaken. The directors don't need to implement their proposal in Malaysia. Therefore, this study's results are significant based on actual events.

My data runs from January 2017 through December 2021. Although share repurchases have been allowed since September 1997, the date is chosen to see the impact of repurchases during Malaysia experiencing tremendous economic growth of above 5% annually of its Gross Domestic Product (Bank Negara Report 2016). Also, there happens to be no crisis during this period allowing the researcher to examine the market during normal situations. During a crisis, share repurchase may not be effective because the whole market would be declining fast due to a general lack of market confidence, and the 10 percent annual repurchase limit set by the local regulation i.e. Securities Commissions would not be able to absorb the selling pressure. The samples include a large figure totaling 10,519,573,574 events with several repurchase days at 28,277 events with 378 (100%) firms that do share repurchase announcements across all sectors from the year 2017 until 2021 from audited finally for 109 companies that are actively doing repurchases and actively listed on Bursa Malaysia. This size and event are important being big enough to have an acceptable representation of the whole population discussed that a bigger portfolio size gives a more accurate reflection of abnormal return characteristics based on previous literature, but his research findings suggested that portfolio size does not greatly affect the measurementof information content.

I employ the event study methodology to investigate the behavior of share price movement about the announcement of the buyback. As such, setting up the appropriate analysis time frame is critical to obtaining useful data. However, this task is not easy as acknowledged by a few authors. An event study is composed of three time frames: the estimation window, also sometimes referred to as the control period, the event window, and the post-event window. An estimate window is used to determine the normal behavior of share price returns relative to the market index. Data from this period will form the basis of normal price performance and is used as the benchmark for subsequent periods. In the event window, market reaction to the announcement is expected. It is the time frame of study within which the impacts of the event are analyzed. Post post-event window allows measurement of the longer horizon influence of the event. The length of the event window is centered on the announcement and is normally three, five, or ten days and may vary greatly between researches. The event date shall be the effective date of the share buyback for the respective companies, designated as

t=0. The 1 day average effective repurchase days period during post-event is like the longest post-event window in previous work. We will be able to compare the return for each of the windows relative to the others. Each of these periods is an adaptation from research methodology that presented similar timelines.

4. Results

Table 1: Summary statistics of share repurchase activities in the Malaysia Market, 2017-2021

Number of firms	378	100%
Number of repurchase days	28,277	
Total number of shares repurchased	10,519,537,574	
Number of firms with 1 repurchase day	47	124%
Number of firms with 2-10 repurchase days	79	20.9%
Number of firms with 11-20 repurchase days	42	11.1%
Number of firms with 21-40 repurchase days	49	13.0%
Number of firms with over 40 repurchase days	161	42.6%
Average number of repurchase days per firm	74.81	

Source: Bursa Malaysia (www.bursamalaysia.com)

The table above provides an overview of the repurchase activities during the sample period. During the sample period, 378 firms had a total of 28,277 repurchase days which is by far larger than any studies being done in Malaysia with a total purchase of 10,519,537,574 shares. In the process of collecting the data, I observed that firms exhibit varied forms of repurchase behavior. Some firms aggressively pursue repurchases, making purchases very frequently within a short period while others make their purchases less frequently but consistently than spread over a longer period. It is not uncommon for a firm to make just a single repurchase and then go through the process of renewing the approval the following year.

The table above shows that 47(124%) firms make a single-day repurchase, between 2 and 10 days 21%and more than half of the firms spread their repurchase activities above 40 days 42.6%.On average ascompared to firms have shortened their repurchase days indicating higher activities onrepurchasing with a total number of shares repurchased at a staggering above RM 10 Billion total shares.

Discussion

Results in this study are consistent with the signaling hypothesis and with most of the previous studies.The market will interpret a firm's decision to repurchase its shares as a positive signal. It can alsobe interpreted from the results that the management deliberately timed their repurchase after a period ofdeclining prices. My results show that, if correctly used, share repurchase may become an effective tool forstock price stabilization of the particular companies doing the repurchases. But for this to be effective, management must constantly be aware of the stock price movement and must be in line with the directors' instinct and intuition of when is the right time to make repurchases. The results also complement other studies in this area. There is a continuation of price increase even after 60 days from repurchase day 0. This is consistent with the efficient market hypothesis which is quickly reflected in the adjustment of the shareprice to adjust to its market price.

From Table 1 there is a consistency in the price movement. In this respect, my results complement the previous studies such as Vermaelen (1981), Asquith and Mullins (1986). For Malaysia and most Asian regions, the period from 2017 to 2021 is considered bullish. Malaysia consistently has a growth rate of 5.5% yearly (Bank Negara Report, 2018) market reactions were strongly positive and significant. During these bullish years, firms do not time their repurchases. As shown from Table 5 repurchases and CAR are constantly providing positive results. Here I reason out that firms even under bullish situations keep on repurchasing may be to achieve a higher gain in market price or to achieve certain company objectives that may not be achieved internally. The table above shows the Average Return (AR) and Cumulative Abnormal Return (CAR) around the PE ratio of firms for a total sample of n=329. The P/E ratio shows a tremendous rise after repurchasing days zero (0). It went up aggressively by day 31 to end up at 3.8821 by day 60. The resulting reduction in shares on the market led to an increase in the P/E ratio. This benefited the company since the P/E ratio shows the performance and growth of the company. Investors can be confident of the prospects of the company from repurchase activities. The market

interprets a firm's decision to repurchase its shares as a positive signal. These results are consistent with the signaling hypothesis and with most of the precious studies such as even though this study does not look at the size effect, since the firms selected are stable, mature, and come from a variety of industries, and since BSKL had combined the main board and the second board, therefore it does not reflect the information asymmetry theory. However, we can conclude, to a certain level, that the firms in this study are subject to lower information asymmetry because these firms are invested in by large institutional traders, hence there is a wide coverage by media and analysts. Other studies provide evidence of the signaling size effect.

In Malaysia in this context, the study analyzes the main board (large firms) versus the Second Board (small firm) samples and finds that there is no significantdifference between the two boards in their announcement returns. Based on results, Cumulative Abnormal return and equity dividend yield shows strongly that share repurchase is a substitute for dividend payments. After repurchase day from day zero (0) till day +60, it is seen that the dividend had reduced tremendously. Share repurchase can be proven over here as a substitute for cash dividends. Take note that these findings are recent findings of firms across the board from 2017 – 2021. In situations where capital gains tax is lower than dividend tax rates, share repurchase would constitute a better alternative to distributing cash to shareholders. Share repurchasing results in price appreciation that will give capital gain to shareholders that if realized, will be taxed at the capital gain tax rate, which is lower than the personal income tax rate that will be imposed on dividends. Hence when repurchases are used instead of cash dividends, share value ought to increase. Also, reasons to adjust the capital structure of the firm whereby increasing the debt component and reducing the equity component can increase the value of the firm. A repurchase can be used to restructure the company's capital structure without increasing the company's debt load.

5. Conclusion

This research looks at a very large level and in-depth analysis of repurchase days which come to a total of 39807 days of repurchases. The data are taken from Bloomberg data updated daily from BSKL. The raw data is cleaned and the final firms that can be calculated are 109. From these 109 companies, the total sample of events is derived from 329 events. Some companies have a minimum of 1 event and some companies have a maximum of 4 events of repurchases. The mean at - 60 days is 1.2109 which meansthe average mean for the 109 companies on that particular -60 days is 1.2109. One (1) event is taken as 121 days which also means 60 days before and 60 days after where the repurchase day is considered as day 0. The average return (AR) shows the daily average return for 109 companies. The Cumulative Abnormal Return (CAR) is calculated by the sum of the Average Daily Return for each day multiplied (*) by the sum of the total Average Return. For % of CAR = Total of Daily CAR * Sum of Total CAR * 100, This research has contributed specifically to the Malaysian context and covered certain aspects based on the variables being analyzed that have an impact on the Malaysian economy. Based on the results, Sales and Earnings of companies are to be on the growing side. Hence companies use the profits for the purchasing of shares which will increase the return for shareholders. The analysis shows that an increase in the variablecash flows will increase the amount of money available for shareholders to repurchase shares. Further, the analysis shows the variable book value plays an important role in the level of share repurchases. This research also shows that higher net income will result in higher repurchases done by companies. Price Book ratio variables show significant effects on the amount of repurchases. Surprisingly, this study shows that the increase in share repurchase activity does not reduce the amount of dividends paid by Malaysiancompanies. Also, the decision on share repurchases is not affected by the tax rates levied by the government. The low-level ratio of cash flow to equity does not have any effect on the share repurchase decision made by companies.

The study's findings imply, therefore, that a firm with excellent growth and profitability potential should clearly articulate its reasons for share repurchases because, arguably, the capital committed to the repurchase could be better employed elsewhere. Therefore, without a clearly expressed rationale, the company's decision to conduct a repurchase program could be misinterpreted by investors as a negative signal. But the converse is also true buyback programs by companies that are doing poorly are seen as a positive sign. That's because investors interpret the repurchases as a welcome return of capital and an indication that management is turning the business around. The implications for chief financial officers are also profound. The decision to implement a share repurchase program has major implications for the remaining components of shareholder value creation-in fact, a ripple effect. For example, financial executives must start their decision-making by evaluating

the demand for investment funds, as determined by the availability of investment opportunities. They also need to look at the supply ofinvested funds, which is determined primarily by the company's profitability. While the study makes an important contribution to the repurchase signaling and governance research, there are limitations in this study.

The findings of this study are limited to the very specific context of the research, namely, repurchase and the periods and variables employed. Factors such as types of ownership, types of offers, presence of venture capitalists, growth opportunities, incentive contracts, and other institutional differences (i.e., share allocations to specific investors) are likely to be related to asymmetric information problems and, thus, may affect the extent of underpricing. These factors present potential issues for future research on the repurchase phenomenon in Malaysia. Corporate governance mechanisms and organizational structures are also likely to evolve as firms mature, and these changes may affect the aftermarket performance of repurchases. As such, longitudinal studies of the board evolution of post-repurchase can potentially provide insights into how firms adjust their governance and control structures to accommodate regulatory changes and strategic challenges. Regarding policy implications, the findings of this study point to a paradox for advocates of good corporate governance practices. Recent regulatory initiatives related to principles and practices of good corporate governance may be in danger of becoming over-prescriptive of formal "box-ticking". Although good corporate governance structures are regarded as important prerequisites (but certainly not as sufficient conditions) for investment in repurchase, major drivers of good corporate governance, such as the board of directors, information, and disclosure, are less valued by investors in the Malaysian markets. Share prices and returns are more affected by factors such as a firm's competitive environment and future strategies rather than the firm's governance structures. Much corporate governance, this study included, examines the relationships between easily observable organizational structures and measurable performance outcomes of repurchase but often provides little evidence or explanation about how the two are linked. By scrutinizing behavioral processes, future research may incorporate a more qualitative understanding of how corporate governance elements interact and influence investors and managers in repurchase processes. A behavioral approach would help to understand issues of investing in repurchasing shares in developing markets and would help to explain how potential investors use corporate governance variables to repurchase in these markets.

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The Impact of Restaurant's Online Food Delivery (OFD) Service Quality on Customers' Repurchase Intention: A Conceptual Framework

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Abstract: The outbreak of the COVID-19 pandemic in 2020 had a profound impact on the food service industry, forcing many restaurants and eateries to pivot towards online food delivery (OFD) services to survive. This shift, driven by restrictions on dining-in, has persisted even as dine-in services resumed, positioning OFD as an integral part of restaurant operations. This paper explores the impact of service quality in OFD, proposing a conceptual framework that links service quality dimensions—such as delivery speed, order accuracy, customer service, and platform usability—to the customer's repurchase intention of food from the restaurant via its OFD services. By addressing these dimensions, restaurants can enhance customer satisfaction, leading to improved financial outcomes. This study aims to provide actionable insights for restaurant operators and contribute to the existing literature on service quality within the OFD sector.

Keywords: *Online food delivery (OFD), Service Quality, Repurchase Intention, Customer Satisfaction*

1. Introduction and Background

The outbreak of the COVID-19 pandemic in 2020 severely affected the food businesses, particularly food eateries such as restaurants, cafes, food stalls, and fast-food joints. With restricted movements, dine-in at these places dropped badly, hitting on their profits and forcing some to shut down. To stay alive, many of them were forced to shift to the practice of online food ordering and delivery services to get their offerings to the customers. Thus, we saw a surge in the use of online food delivery (OFD) services such as Foodpanda and Grabfood, during the COVID-19 pandemic. Though the pandemic has subsided, and these food eateries are getting back their customers into their premises, they continue using the OFD services. From merely assisting businesses to survive the hardship of COVID-19, the use of OFD services has become an essential part of the operation of these food businesses and may add to their overall financial performance. This online food delivery platform has fundamentally altered the restaurant industry, transforming the way consumers place orders and receive their food. This shift has not only enhanced convenience for consumers but has also created new challenges and opportunities for restaurants aiming to maintain a competitive advantage in a rapidly evolving market landscape (Chowdhury, 2023).

As such, an understanding of the variables that influence service quality in online food delivery—such as delivery speed and order accuracy—becomes essential for restaurants seeking to optimize their financial performance and customer retention efforts in this competitive environment (Azman et al., 2021; Saad, 2020). The interplay between these service quality dimensions and customer satisfaction is increasingly recognized as a critical factor that can drive repeat business and, subsequently enhance the overall financial performance of restaurants operating within the online delivery sphere (Azman et al., 2021). In Malaysia, the popularity of online food delivery has gained strong momentum due to the various advantages offered by these services, with consumers increasingly turning to platforms that allow them to customize their orders and receive meals in a manner akin to the in-restaurant experience (Tarmazi et al., 2021). This trend underscores the necessity for restaurants to not only focus on the quality of the food but also invest in their delivery services, customer interactions, and the overall user experience on their platforms to foster loyalty and ultimately improve their profit margins (Azman et al., 2021). Moreover, the effective management of these service quality dimensions, alongside factors such as delivery tracking and the attitude of delivery personnel, plays a significant role in enhancing customer satisfaction and retention, which are pivotal for driving long-term financial success in the industry (Tarmazi et al., 2021, Azman et al., 2021; Saad, 2020, Tarmazi et al., 2021; Idris et al., 2021). Furthermore, the ability to provide timely updates and ensure accurate order fulfillment is critical, as these elements significantly influence customer perceptions and their likelihood to return for subsequent orders,

ultimately affecting the restaurant's financial viability in an increasingly digital marketplace (Azman et al., 2021; Saad, 2020). Issues related to order cancellations, inaccuracies, and the quality of customer service interactions can have detrimental effects on customer satisfaction, leading to decreased retention rates and impacting restaurants' financial outcomes negatively (Smith & Heriyati, 2023). Customer grievances regarding order accuracy and delivery efficiency can significantly undermine both satisfaction and profitability in the fast-evolving online food delivery landscape (Smith & Heriyati, 2023, Tarmazi et al., 2021). As such, restaurant operators must prioritize the assessment and improvement of their online service quality to increase customer satisfaction, promote repeat purchases, and gain a competitive edge.

Existing literature has explored the impact of service quality on customer satisfaction in the online food delivery context, highlighting the multidimensional nature of this construct. Research indicates that consumers' perceptions of various aspects of service quality, including the efficiency of the delivery process, the attentiveness of customer service, and the overall user-friendliness of the online ordering platform, can significantly influence their willingness to continue engaging with a particular delivery service (Smith & Heriyati, 2023). Moreover, enhancing these service quality dimensions not only contributes to higher levels of customer satisfaction but also plays a vital role in fostering customer loyalty, which is critical for sustaining financial performance in the highly competitive online food delivery market (Smith & Heriyati, 2023; Sahidi et al., 2022). Furthermore, businesses must recognize that the quality of service extends beyond mere logistics; it encompasses the entire customer journey, from the ease of placing an order to the condition of the food upon delivery, all of which can impact consumer perceptions and future purchasing behavior. To effectively leverage these insights, restaurants, and delivery services must prioritize improvements in service quality dimensions, as the resulting customer satisfaction can lead to increased customer retention rates, directly influencing their financial viability and success in an e-commerce landscape characterized by heightened competition and evolving consumer preferences (Ahmed, 2019; Idris et al., 2021; Azman et al., 2021; Abdullaeva, 2020). In this regard, a strategic focus on service quality may not only enhance customer retention rates but also allow restaurants to build stronger relationships with their clientele, ultimately leading to sustained revenue growth and a competitive edge in the market.

Research findings suggest that organizations that prioritize superior service quality are better positioned to fulfill customer needs and expectations, thereby increasing customer satisfaction and establishing a loyal customer base essential for long-term financial success in the online food delivery sector (Azman et al., 2021) (Kaur, 2018). Enhancing service quality across various dimensions, such as timely delivery and accurate order fulfillment, can significantly affect a restaurant's ability to retain customers, as satisfied customers are more likely to return and recommend the service to others, resulting in improved financial performance and profitability (Smith & Heriyati, 2023; Ahmed, 2019). The implications of these findings underscore the necessity for restaurant managers to carefully evaluate and invest in the dimensions of service quality they offer through online platforms, thereby ensuring that customer expectations are not only met but exceeded, as this can lead to a robust increase in customer loyalty and, consequently, enhanced financial performance (Ahmed, 2019; Kaur, 2018; Abdullaeva, 2020; Ladhari et al., 2008).

Furthermore, as competition intensifies and customer preferences evolve, it becomes increasingly crucial for restaurant operators to continuously assess and refine their service quality strategies, thereby ensuring they remain responsive to consumer expectations while simultaneously seeking to maximize their financial outcomes in the online food delivery landscape. To navigate this complex environment effectively, restaurants must adopt a holistic approach to service quality that integrates feedback mechanisms, quality control processes, and ongoing employee training, ensuring that every aspect of the customer experience is optimized to encourage repeat patronage and drive financial success in the long term. (Abdullaeva, 2020; Ladhari et al., 2008; Ahmed, 2019). Incorporating such comprehensive strategies not only fosters a culture of excellence within the organization but also enables restaurants to adapt swiftly to the changing market dynamics, ultimately enhancing their reputation and encouraging customer loyalty, two pivotal elements that significantly contribute to improved financial performance in the competitive online food delivery industry (Ahmed, 2019; Abdullaeva, 2020; Azman et al., 2021; Ladhari et al., 2008).

The conceptual framework presented in this research paper underscores the critical role of service quality in the online food delivery industry and its influence on the customers' intentions of continuously supporting the

restaurants' online business. Overall, the research highlights the necessity for restaurant operators to understand and implement service quality improvement strategies that are aligned with evolving consumer expectations, as this not only enhances customer satisfaction but also significantly contributes to their long-term profitability and competitiveness within the food delivery sector, which is increasingly driven by customer loyalty and retention, necessitating a strategic emphasis on delivering exceptional service quality across all operational dimensions to foster a robust performance in an ever-changing market landscape. Moreover, the insights derived from existing studies suggest that the direct correlation between service quality and customer retention underscores the strategic imperative for restaurant operators to consistently evaluate their service offerings, thus allowing them to cultivate deeper customer connections and enhance their competitive positioning in the burgeoning online food delivery market (Ladhari et al., 2008; Ahmed, 2019; Azman et al., 2021; Abdullaeva, 2020).

This research proposes a critical need for empirical studies that explore how various dimensions of online service quality directly contribute to customers' repurchase intention of the food from the restaurant via its OFD services. This lack of comprehensive understanding hinders restaurant operators from making informed strategic decisions regarding service enhancements that could bolster customer satisfaction and retention, and meaningfully affect their overall performance. This is especially important in today's fast-evolving digital marketplace where customer preferences are changing rapidly. Bridging this research gap is essential for restaurant managers to develop effective strategies that align service quality improvements with enhanced performance, enabling them to stay competitive and capitalize on the growth opportunities presented by the booming online food delivery market. By conducting comprehensive studies that examine the intricate relationship between service quality dimensions and customer repurchase behavior, researchers can provide restaurant operators with actionable insights and data-driven recommendations to optimize their service offerings, ultimately driving customer retention, loyalty, and sustainable profitability in this dynamic industry. This necessitates a focused approach to integrate service quality metrics into performance assessments and ultimately results in improved financial viability for restaurants operating in the online food delivery sector.

The primary objectives of this study are to:

- Develop a conceptual framework that delineates the key dimensions of service quality in online food delivery and their direct impact on customer's repurchase intention for restaurants.
- Empirically examine the relationship between service quality dimensions (delivery speed, order accuracy, customer service, food quality upon delivery, ease of use of the delivery platform, and communication and updates) and customer's repurchase intention.
- Provide restaurants with actionable insights and strategic recommendations to enhance their service quality and optimize their performance in the online food delivery market.

To seamlessly integrate restaurant online food delivery services into the restaurant business, it's essential to have a quality services delivery system that can keep things running smoothly from the moment of ordering till the food reaches the customers. Thus, this study contributes to the existing body of knowledge by addressing the research gap and offering a comprehensive understanding of the intricate relationship between service quality and restaurant performance in the growing online food delivery industry. Particularly, the study analyses the customers' perceptions of the service quality of the online food delivery (OFD) services used by the restaurant, and how it can lead to customers' continuous support of the restaurant's online business. As found in previous studies, customer retention and loyalty in the restaurant sector could affect the overall financial performance of food service establishments (Wu, 2013; Noh et al., 2023; Abdullaeva, 2020; Ahmed, 2019).

2. Literature Review

The six key dimensions of service quality in online food delivery are:
Delivery Speed, Order Accuracy, Customer Service, Food Quality Upon Delivery, Ease of Use of the Delivery Platform, and Communication and Updates are the key dimensions that define the service quality in online food delivery. These elements collectively shape the customer's overall experience and directly influence their satisfaction, which in turn impacts critical financial performance indicators such as customer retention rates and profitability for restaurants. By strategically optimizing these service quality dimensions, restaurants can

cultivate a loyal customer base, driving sustainable growth and gaining a competitive edge in the highly competitive online food delivery market. Moreover, research indicates that each of these dimensions plays a pivotal role in determining customer perceptions and behaviors, ultimately influencing their decisions to revisit and recommend restaurants, thereby underscoring the importance of maintaining high service quality standards to ensure long-term profitability and success in this dynamic industry. In this context, restaurant operators must recognize that a superior service quality framework not only fulfills customer expectations but also significantly contributes to enhanced financial outcomes through increased customer retention, as established in prior research indicating the strong correlation between perceived service quality and customer loyalty, satisfaction, and repeat patronage in the restaurant sector (Ladhari et al., 2008; Abdullaeva, 2020).

Ensuring efficient and timely delivery, providing accurate orders, delivering exceptional customer service, maintaining the quality and temperature of the food, offering a user-friendly digital platform, and effective communication throughout the process are all crucial factors that contribute to a positive customer experience. By optimizing these service quality dimensions, restaurants can cultivate a loyal customer base, drive repeat business, and improve their overall financial performance in the highly competitive online food delivery market. This holistic approach not only enhances customer satisfaction but also fosters brand loyalty, as research has shown that customers are more likely to return to establishments that consistently meet or exceed their service expectations, which is essential for sustainable growth in the restaurant industry (Azman et al., 2021).

Delivery Speed, for instance, encompasses the timeliness of order fulfillment, from the moment a customer places an order to the food arriving at their doorstep. Prompt and reliable delivery not only meets customer expectations but also fosters a sense of convenience and satisfaction, encouraging repeat business. Customers value the ability to receive their orders quickly, as it demonstrates the restaurant's efficiency and commitment to providing a seamless dining experience, even in the context of online food delivery.(Leo et al., 2022; Kimes, 2011; Ramli et al., 2021). Timely delivery also helps to ensure that the food maintains its freshness, temperature, and quality, further enhancing the customer's overall satisfaction with the service. Efficient and speedy delivery is a critical aspect of service quality that can significantly impact a customer's willingness to continue using the online platform and recommend the restaurant to others(Were et al., 2019; Kuo et al., 2011; Leo et al., 2022). In addition, research indicates that a delay in delivery can lead to increased customer dissatisfaction, often resulting in a negative perception of both the restaurant and the delivery service, ultimately lowering the likelihood of future orders from that customer and adversely affecting the restaurant's financial performance (Reddy & Aradhya, 2020; Idris et al., 2021).

Order Accuracy is a critical dimension of service quality in online food delivery, as it ensures that customers receive the exact items and portions they requested. Accurately fulfilling orders is a fundamental expectation for customers, and any discrepancies can lead to significant dissatisfaction and frustration (Kaipia et al., 2002; Rao et al., 2011; Yang & Peterson, 2002). Providing the correct order demonstrates the restaurant's attention to detail and commitment to delivering a high-quality dining experience, even in the remote context of online ordering. Customers highly value the assurance that their specific dietary requirements, preferences, and order specifications will be consistently met, as it reinforces their confidence in the restaurant's capabilities and reliability. Failure to fulfill orders accurately can have serious consequences, as research indicates that inaccuracies can significantly diminish customer loyalty and increase the likelihood of negative reviews, ultimately impacting the restaurant's reputation and future sales opportunities (Idris et al., 2021). In the competitive online food delivery landscape, where customers have numerous options, maintaining consistent order accuracy is essential for cultivating customer trust, satisfaction, and loyalty, which are key drivers of financial performance for restaurants. Accurate order fulfillment not only meets customer expectations but also builds a strong reputation for the restaurant, fostering repeat business and positive word-of-mouth. By consistently providing the correct items and portions, restaurants can demonstrate their commitment to quality, reliability, and attention to detail, which are all crucial factors in shaping a positive customer experience and driving customer retention, a critical financial performance indicator.

Effective Customer Service, through responsive and helpful interactions, can further enhance the overall experience and leave a lasting positive impression on customers. Delivering exceptional customer service, whether through prompt responses to inquiries, resolving any issues or concerns, or providing additional

support, can significantly contribute to a customer's overall satisfaction and willingness to continue using the online platform (Jafarpour et al., 2017, Hult et al., 2019; Thaichon et al., 2014). Positive customer service interactions can foster a sense of trust and loyalty, as customers perceive the restaurant as genuinely invested in their satisfaction and overall dining experience.

The quality of food upon delivery plays a critical role in shaping customer perceptions, as receiving warm, fresh, and visually appealing meals is integral to a satisfactory experience; this aspect of service quality is essential for ensuring that customers are pleased with their orders and willing to return for future purchases. To achieve this, restaurants must prioritize quality control measures to safeguard food temperature and presentation during the delivery process, recognizing that these factors greatly influence customer perceptions of value and satisfaction, ultimately impacting their likelihood of placing repeat orders and generating positive reviews that can drive new business. In Malaysia, effective customer service is particularly important, as the growing trend of dining out and fast-food consumption among families with busy schedules emphasizes the need for restaurants to provide a seamless, convenient, and satisfying online ordering and delivery experience (Nayan & Hassan, 2020; Shahril et al., 2021).

The ease of use of a delivery platform, encompassing both the website and mobile application, is a critical determinant of customer satisfaction and, consequently, business success. A user-friendly interface, characterized by intuitive design, significantly simplifies the ordering process, minimizing potential frustrations arising from navigation and selection. Features such as clear menus, a logical information architecture, readily accessible search bars, and personalized options like saved addresses and payment information contribute to a seamless and efficient user experience (Sharma & Bhargav, 2023; Nor et al., 2023; Ekşioğlu, 2016). Moreover, a streamlined ordering process, often facilitated by real-time order tracking and multiple payment options, can significantly influence a customer's propensity for repeat orders. Research indicates that users are more likely to repeatedly engage with platforms that are simple to navigate and efficient to use, highlighting the importance of this service quality dimension (Bateman et al., 2017). By prioritizing ease of use, businesses can reduce cart abandonment rates, increase conversion rates, and improve customer lifetime value, ultimately gaining a competitive advantage in the dynamic online food delivery market.

Finally, effective Communication and Updates regarding order status and delivery timelines can contribute to a positive customer experience. Keeping customers informed about their order status fosters transparency and trust, leading to a more satisfying experience (Xiong, 2010; Bateman et al., 2017; Felix & Rembulan, 2023). By providing timely updates and clear information, restaurants can alleviate any potential anxieties customers may have about their orders, thereby reinforcing their loyalty and creating a sense of reliability that is essential for maintaining a competitive edge in the online food delivery market (Azman et al., 2021). Such an approach not only addresses immediate customer concerns but also contributes to long-term loyalty, as consistent and proactive communication can significantly enhance customers' perceptions of the service quality provided, ultimately influencing their decision to return and engage with the restaurant in future transactions. Moreover, as highlighted in recent studies, customer satisfaction is closely tied to their overall perceptions of service quality; therefore, the restaurant's ability to manage these dimensions effectively can lead to a more favorable customer retention rate and, subsequently, improved financial performance. Given the significance of these service quality dimensions, it becomes clear that their effective management not only ensures customer satisfaction but also plays a crucial role in enhancing the customer retention rate, which is a vital indicator of financial performance in the restaurant industry. Research suggests that by facilitating a seamless and pleasant online ordering experience through these dimensions of service quality, restaurants can foster enduring relationships with customers, ultimately optimizing profitability and sustaining growth in a competitive market (Idris et al., 2021).

For restaurants that incorporate the use of online food delivery services, customers can order food online, wait, receive the delivered food, and then eat at any place of their convenience. For these customers, their satisfaction with the restaurant is not only based on the quality of the food but include also the whole experience of making the order. Thus, for restaurants that offer online delivery services, repeat purchases are critical for their success. Repurchase intention is the process of an individual purchasing goods or services from the same firm (Hellier, Geursen, Carr, & Rickard, 2003), and the tendency to repurchase is based on how customers assess their past purchase experiences.

Restaurants can effectively leverage the online food delivery platform by ensuring the various facets of the service quality are carried out effectively to drive the customers to continue ordering online from these restaurants. By strategically optimizing these service quality dimensions, restaurants can cultivate a loyal customer base, driving sustainable growth and gaining a competitive edge in the highly competitive online food delivery market. Moreover, research indicates that each of these dimensions plays a pivotal role in determining customer perceptions and behaviors, ultimately influencing their decisions to revisit and recommend restaurants, thereby underscoring the importance of maintaining high service quality standards to ensure long-term profitability and success in this dynamic industry.

Research has shown that customer trust in the restaurant and the delivery service provider can also play a crucial role in determining repurchase intention. When customers have confidence in the restaurant's ability to deliver high-quality service, they are more likely to return and place additional orders.(Sirimongkol, 2021; Othman et al., 2013). This is particularly relevant in the context of the COVID-19 pandemic, where customers may be more cautious about their dining choices and prioritize reliable and trustworthy service providers.

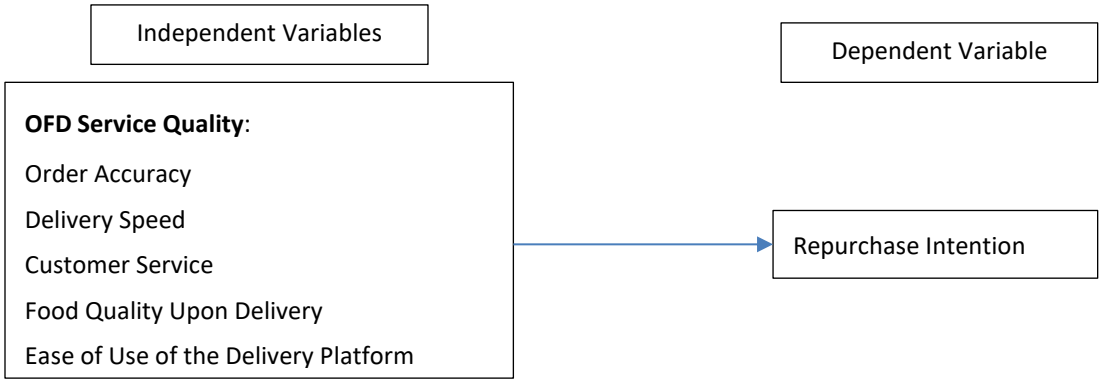
The restaurant industry has undergone significant changes in recent years, with the emergence of online food delivery services becoming increasingly popular among consumers. These services have transformed the way customers interact with restaurants, allowing them to order and receive their meals without leaving the comfort of their homes. As the competition in the online food delivery market intensifies, restaurants must understand the factors that influence customers' repurchase intention (Yeo et al., 2021).

Moreover, as the competition in the online food delivery market continues to intensify, restaurants that can deliver a consistently high-quality service are likely to have a significant advantage in retaining and attracting customers. By prioritizing and improving key aspects of their online food delivery service, such as timely order fulfillment, proper food handling, and exceptional customer support, restaurants can differentiate themselves in the crowded market and build a loyal customer base that continues to place repeat orders (Idris et al., 2021).

Conceptual Framework

Based on the research objectives and the review of existing literature, the following conceptual framework is proposed to examine the impact of service quality in online food delivery on the customer's repurchase intention of restaurants:

This framework depicts the key dimensions of service quality in online food delivery as the independent variables, which are expected to have a direct influence on the dependent variable of customer retention rate, a critical financial performance indicator for restaurants. Furthermore, the framework suggests that enhancements in service quality, such as improved order accuracy and faster delivery speed, not only boost customer satisfaction but also cultivate loyalty among diners, thereby providing a sustainable competitive edge in the increasingly saturated online food delivery landscape, thus reinforcing the direct positive impact on customer's repeat purchase from the restaurant.



3. Research Methodology

To achieve the stated objectives, this study will employ a mixed-method research approach, incorporating both qualitative and quantitative elements. This approach will enable a comprehensive analysis of service quality dimensions as perceived by customers, as well as their subsequent impact on restaurant financial performance indicators, harnessing both survey data and in-depth interviews to triangulate findings and provide robust insights into the complex interactions at play.

The research will be conducted in the following phases:

Qualitative Phase: This phase will involve in-depth interviews with restaurant managers and online food delivery platform representatives to gain a deeper understanding of the key dimensions of service quality and their perceived impact on the restaurant's performance (such as repeat order and retention rate) from the industry's perspective.

Quantitative Phase: A large-scale customer survey will be designed and deployed to capture customers' perceptions of service quality and its influence on their satisfaction and propensity for repeat orders through online delivery platforms.

Data Analysis: The qualitative and quantitative data collected will be analyzed using appropriate statistical techniques, such as multiple regression analysis, to empirically examine the relationships between service quality dimensions and financial performance indicators, including customer retention rates and profitability.

Validation and Refinement: The conceptual framework will be validated and refined based on the findings from the data analysis, ensuring the robustness and generalizability of the research insights.

4. Dissemination and Recommendations

The study will conclude with the development of actionable recommendations for restaurant operators to enhance their service quality and optimize financial performance in the online food delivery market, which will be disseminated through academic publications and industry-focused knowledge-sharing platforms. In addition, the research will explore the implications of service quality on customer loyalty and retention, highlighting not only the immediate financial impacts but also the long-term benefits of developing strong customer relationships through consistent and high-quality service delivery, as previous studies have shown that customer loyalty is a key driver of sustained profitability in the restaurant industry (Ahmed, 2019).

By employing this mixed-method approach, the study will provide a comprehensive understanding of the complex interplay between service quality and repurchase intention in the online food delivery sector, offering valuable insights to both academics and industry practitioners. This research aims to contribute to the existing body of knowledge by offering empirical evidence on the critical role that service quality plays in shaping customer behaviors and preferences, ultimately leading to better financial outcomes for restaurants in a competitive marketplace (Ahmed, 2019). Furthermore, the anticipated findings are expected to enrich the existing literature on service quality in the hospitality sector, particularly by demonstrating how service quality dimensions can directly influence customer loyalty and retention, thus fostering sustainable profitability for restaurants engaged in online food delivery services, as highlighted in prior research (Leo et al., 2022; Kuo et al., 2011; Ahmed, 2019; Abdullaeva, 2020). In conclusion, the study will not only underline the importance of optimizing service quality dimensions but also advocate for a strategic approach to customer engagement that leverages these insights for enhanced financial performance, thereby aligning with the consensus that customer loyalty—fueled by high-quality service—is a key driver of long-term success in the restaurant industry. Ultimately, this research aims to provide actionable recommendations that align with the evolving expectations of consumers in the online food delivery market, thereby facilitating enhanced customer loyalty and retention as fundamental components of sustained financial success for restaurants (Leo et al., 2022; Abdullaeva, 2020; Ahmed, 2019).

In conclusion, this study offers a comprehensive examination of the impact of service quality dimensions on customers' repurchase intention from restaurants engaged in online food delivery services. By elucidating the intricate relationships between these variables, it aims to offer empirical insights that can guide restaurant operators in formulating strategies to enhance service quality and foster customer loyalty, which are essential for achieving long-term profitability in an increasingly competitive landscape (Abdullaeva, 2020). As such, restaurant managers are encouraged to focus on improving service quality in all its dimensions, as research indicates that higher service quality not only increases customer satisfaction but also enhances customer retention rates, ultimately driving financial performance and competitive advantage in the online food delivery market.

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Understanding the Decision to Purchase Health Insurance Among Academicians

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Abstract: This study investigates various factors influencing the decision of academicians in Malaysia to purchase health insurance. Health insurance is a policy that gives coverage for medical expenses and hospitalization. In Malaysia, health policy is commonly known as medical policy and the term medical card is broadly used to represent health policy and the benefits available under the policy. Through qualitative interviews with six faculty members, the research uncovers the complexities of the decision-making process. The findings reveal that personal experiences, cultural values, social influences, and financial considerations significantly shape these decisions. However, the study's small sample size and regional specificity limit the generalizability of the results. Future research should address these limitations by incorporating a larger and more diverse sample to enhance the external validity of the findings. Such an approach would provide a more comprehensive understanding of the factors influencing health insurance decisions and inform policy interventions aimed at improving healthcare accessibility and affordability.

Keywords: *Purchase intention, Health insurance, Academicians*

1. Introduction and Background

Health insurance operates as a financial instrument for individuals to mitigate the financial burden associated with medical-related costs and expenditures. Thus, this will offer a sense of security and peace of mind to the individual. In Malaysia, this policy is commonly known as medical insurance and the medical card is broadly used in representing health insurance policy and the benefits available under the policy. The fundamental focus is providing coverage for medical expenses and hospitalization benefits to the insured. However, diverse plans are offered by insurance companies, to meet the distinct needs of potential insured individuals. This paper aims to understand the factors that influence academicians' decision to purchase health insurance policies. Academic professionals, being a specific demographic with unique needs and considerations, present an intriguing cohort for analysis. This research provides an in-depth understanding of the motivations, preferences and challenges that drive academicians in Malaysia toward embracing health insurance coverage.

2. Literature Review

Health Insurance Industry in Malaysia

The health insurance industry is a crucial component of Malaysia's economy, playing an important role in mitigating personal and business risks associated with uncertainties. According to Gupta (2019), in 2015, health insurance accounted for 4.2% of the overall industry's premium. Consumers, in pursuit of superior services, are turning to private healthcare, despite government initiatives aimed at providing exceptional public healthcare (Rahman, 2010). Many Malaysians prefer the option of private healthcare as compared to government healthcare service provided as it is regarded to be of higher quality and has a shorter waiting time. According to Jaafar et al. (2013), highlighted 54% of medical specialists are associated with private emergency clinics, contributing to 20% of total admissions and over 12% of total outpatient attendances. This trend has had a substantial impact on the demand for health insurance since people are more likely to obtain insurance policies that allow them to use private medical facilities. Rahman (2010) describes attempts to improve public healthcare facilities. Projections by Tay et al. (2020) suggest that private emergency clinic beds are expected to constitute half of all medical clinic beds by the year 2020.

Factors Influencing the Purchase of Health Insurance Policies

A study conducted by Anil Singh and Malay (2021), found that there are six (6) significant key factors influencing individuals in their decision-making process to purchase health insurance policies, which are awareness, company-related information, risk, promotion, tax benefits, and security. The acquisition of

insurance policies depends on individuals' income levels. Lower-income groups of people often display less interest in purchasing policies when their priorities in fulfilling their immediate needs. Conversely, individuals with sufficient income exhibit a greater inclination to pay insurance premiums (Khan & S. Ahmed, 2013). This is supported by Aizuddin and Aljunid (2017) mentioned that the ability to pay for health insurance was found to be significantly predicted by monthly income and Salameh et al. (2015) in their study found that among public universities employees earning between RM5000 to RM10,000 per month were found to be more ready to pay for health insurance. Despite the above factors, social influences such as peer effects, family and insurance agents have an impact on health insurance demand (Ng et al. 2014). According to Yazid et al. (2012), demographic factors of age and gender are the most important factors in influencing medical and health insurance and Takaful demand.

Several studies undertaken in various countries (Yardim et al., 2010) show that healthcare services, including diagnosis and treatment, place a large cost of burden on consumers. This burden does not only relate to economic issues, but it may also result in treatment discontinuation, especially among low-income households. Thus, this has an adverse effect on the life of patients and their family members.
Health insurance is important in reducing the potentially catastrophic financial costs connected with chronic disease treatment. It helps ease the economic strain, enabling smoother spending patterns and subsequently an improvement in Quality of Life (Geng et al., 2018; Yardim et al., 2010).

3. Research Methodology

Qualitative research traces its origins to the fields of education and social sciences, particularly in the examination of intricate human behaviors (Taylor and Bogdan, 1984). According to Burns and Grove (2010), qualitative research represents a systematic and subjective approach to illuminate and interpret daily life experiences, providing them with significance. This methodology empowers researchers to delve deeply into behaviors, diverse perspectives, and life experiences, uncovering the intricacies of a situation within a holistic framework Creswell (2007, p. 15) characterizes qualitative research as follows:

"Qualitative research is an inquiry process of understanding based on distinct methodological traditions of inquiry that explore a social or human problem. The researcher constructs a complex, holistic picture, analyses words, reports informant details, and conducts the study in a natural setting."

The fundamental aim of this study is to understand the decision-making process of academicians when purchasing health insurance. This is substantiated by the research question focusing on the factors that contribute to the purchase of health insurance among academicians. The study utilizes a qualitative approach, specifically focusing on a phenomenon-oriented investigation. The chosen methodology involves conducting semi-structured interviews, and the research is centered on six (6) academicians selected from the Faculty of Business and Management at UiTM Puncak Alam, Selangor.

4. Results and Discussion

Based on the findings, a thorough exploration has been conducted, probing into the decision-making process and the determinants influencing an academician's choice when acquiring health insurance. The research reveals key factors including preferences for health insurance, personal experiences, and the impact of an individual's cultural and belief systems. Additionally, socio-economic factors and the burden of increased medical expenses have been addressed in the analysis, contributing to a comprehensive understanding of the elements influencing the decision to purchase a health insurance policy.

Theme 1: Personal Experience and Cultural Values and Beliefs in Decision-Making and Challenges

When exploring the factors linked to an individual's decision-making regarding the purchase of health insurance, a comprehensive range of discussions can be undertaken. In the decision-making process, there is a notable emphasis on the substantial impact of personal experience, relationships, and the importance of timely and comfortable treatment in influencing the decision to acquire health insurance. Participants highlighted the role of friends, family, and their own health experiences in shaping their perception of the essential nature of health insurance.

Sub-Theme 1: Uncertainty of Health Conditions and the Influence of Healthcare System Experience

The current health situation with the development of epidemics and the evolution of serious diseases has resulted in health instability in the community. In other words, many patients have been and are seeking treatment in government hospitals as well as in private hospitals. Full beds in the ward are common these days. The health facilities offered by government hospitals are of high quality and comparable to the health facilities offered by private hospitals. Many specialist doctors of high caliber are from government hospitals. However, because of the comfort and speed of the treatment process in private hospitals compared to government hospitals, is one of the contributing factors to the demand for private healthcare facilities in the community.

"I strongly agree that health insurance is very important because the health condition is uncertain due to emerging diseases and epidemics."

"My experience with the waiting time and waiting list that are too long in government hospitals. This is the influence factor that led to the purchase of health insurance so that I can use the available benefit provided by the policy."

Sub-Theme 2: The Influence of Family Members, Friends, and Social Media

The demand for health insurance is significantly influenced by various factors, including the opinions of family, and friends, and the pervasive impact of social media. Notably, the sway of social media is particularly recognized for its substantial impact on younger generations. Social media not only impacts the younger generation but also serves as a rapid source of information. Most of the participants do agree with the trend towards increased individual autonomy in decision-making, with participants acknowledging their ability to access timely information from the internet. These are supported by various opinions from the participants interviewed.

"My family history made up the decision that influences towards health insurance."

"The use of social media has helped people to understand what health insurance is. Easy to get information from social media."

"I think TikTok or Instagram or whatever social media platform, it is just another marketing tool. But somehow it helps especially insurance companies to cater to the demand of the youngsters."

Sub-Theme 3: Perception of the Importance of Health Insurance

The perception of the quality of services provided by government hospitals has played a pivotal role in underscoring the significance of acquiring a health insurance policy. As individuals assess and form opinions about the healthcare services offered by government institutions, there is a growing recognition of the need for additional financial protection in the form of health insurance. This heightened awareness is driven by a desire to ensure comprehensive and timely access to healthcare services, recognizing that a health insurance policy can serve as a crucial safeguard in the face of uncertainties related to medical expenses.

"Waiting time and waiting list is too long in government hospitals."

"In government hospitals, actually they have specialists who are very good but then in terms of besides the specialists that you are looking at the same time, of course, I think every one of us would want a comfortable place for us."

"Health insurance gives peace of mind."

Sub-Theme 4: Knowledge and Trust to Agents and Takaful Operators

Building trust and fostering personal connections with insurance agents are integral aspects of the insurance relationship. Agents play an important role in guiding and supporting individuals, ensuring they have a thorough understanding of their policies, facilitating smooth claim procedures, and addressing any concerns that may arise throughout the insurance coverage. The importance of this collaborative and supportive partnership between agents and clients, enhancing the overall experience and effectiveness of the insurance relationship.

"I took health insurance before I had my child. I took it from my friend who is my HI agent. When she quit, I changed to another agent. I started to feel HI was not important because I did not know personally this agent. I changed to another agent when my daughter was hospitalized, I realized that HI is very important and I decided to continue with a new company."

"If we don't know the agent, this might give less understanding and information because we might be shy to ask further. Like myself, my agent is my ex-schoolmate. That I know that person."

"I do not understand the terminologies under the policy. Upon warded, I also took part in the co-takaful exercise which I had to pay RM500, and the rest TO will cover. I didn't know about it until I experienced it myself and my agent did not alert me on such conditions."

Theme 2: Socio-economic Factors and the Elevated Medical Expenses

This theme explains socio-economic factors and the increase in medical expenses. Socio-economic factors comprise sub-themes mainly on the income of an individual and their employment status as well as the factors of having the health insurance policy as part of their financial security, especially in mitigating the risks of health and one that has to bear the costs of medical treatments. Meanwhile, the sub-theme of elevated medical expenses will focus on the factors of the rising medical costs and their implications for the policyholders. The discussion will further look into the challenges faced by the policyholders.

Sub-Theme 1: Socio-Economic Factors

The participants widely agreed that both an individual's income level and employment status significantly affect the demand for health insurance policies. The predominant argument among most participants centered on the idea that a higher income enables the ability to afford more extensive coverage, ensuring continued affordability of monthly premiums.

"My experience during the time I worked as an administrator, limited my ability to take comprehensive coverage, but when I changed my career as an academician, it gave me more opportunity to get the best coverage for myself and my family due to the increase in my income and employment status."

This is also supported by Manuela De Allegri et. al (2006) who mentioned that the issue of affordability derived from lack of finances is the main reason for not joining health insurance.

"But if they have a higher income and maybe a good position in their job, of course, I think everyone would also include health insurance in their priority list because everyone now sees the importance of health insurance."

The primary hurdle is not merely enlisting participants in the policy, but rather the key challenge lies in effectively managing and upholding their monthly premium commitments to ensure the sustained efficacy of the policy.

"My main barrier may be due to the increase in premium costs and the premium is high. The main issue is the monthly commitment. In my friend's experience, she terminated her expensive coverage and moved to more affordable health insurance coverage suited to her affordability to pay."

Addressing the aforementioned scenario, individuals belonging to the lower income bracket may choose to rely on government hospitals, as Malaysia offers hospital services at a nominal cost. However, employment status and income would not be the main reason why people decide to purchase health policy.

"Income is not the factor that will influence to purchase of health insurance. Depends on the individual. There are cases in which professors do not have their health insurance policy. And in contrast, there is the ordinary level of workers who do have their health policy."

"*People with higher income would be more interested in looking into health insurance. People with lower income might opt for government hospitals.*"

This is supported by research conducted by Dr. Anil Singh and Dr. Malay Ghosh (2021) stated that one of the six factors contributing to influencing individuals' decision to purchase health insurance policies is the individuals' income levels.

Sub-Theme 2: Financial Security

In the aspect of financial security and protection, participants emphasized their personal experience in the inclusion of savings and investment features in health insurance plans. Besides the analysis has highlighted the perceptions among the participants that health insurance acts as a cushion in times of sickness and serves as a safety net, particularly for critical illness. This is supported by a statement from one of the participants.

"Health insurance acts as a cushion upon our sickness. We must have health insurance coverage, especially with the increase in medical costs."

"Financial security and protection against unexpected healthcare expenses", reveals a strong consensus.

The purpose of having this policy goes beyond accessing top-notch treatment and services in private hospitals, it also includes the added benefit of enjoying savings from the investment features inherent in the policy. This preference arises from a reluctance to bear direct out-of-pocket costs, making the policy an appealing choice. In the state, they would rather go to the government hospital for such treatments.

"My last resort is to use my savings to cover my medical expenses and I would opt for a government hospital."

Sub-Theme 3: Rising of Medical Costs

The raised costs of medical treatment are unpreventable. The costs for medical treatments are very expensive and the costs keep on increasing especially when it comes to critical illnesses the cost is very high.

"Medical costs keep on increasing."

"The increase in costs can be seen especially with critical illnesses, and the cost is very high."

As a result, patients find themselves in the position of having to bear these additional financial burdens on their own. Despite efforts to mitigate the overall expenses through subsidization, the instances where patients are required to personally cover the costs of specific medications and medical equipment remain a prevalent challenge within government healthcare facilities.

"When my father was brought to Hospital UiTM and he underwent treatment, the doctor said if he needed to do a bypass or he needed to do some kind of operation, the cost that only being covered by the government is the doctor's costs but all the medical equipment the users need to be covered by themself."

Azzeri et al. (2020) asserted that health insurance validates government-provided medical treatments, however, lack of healthcare facilities and limited technological access has made international workers choose private health insurance.

Demographic Analysis

Based on the information below, those factors have been elicited from in-depth discussions held during semi-structured interview sessions with six selected academics.

Participant	Age	Insurer	Total Premium Payable for HI (RM)	Income	Frequency of Use for the current year / what year latest used	Year Policy Taken	Any Co-Takaful / Excess Applied
1.	42	BSN Prudential Takaful	300	9000	Did not make any claim since 2019	2007	Yes
2.	45	BSN Prudential Takaful & AIA Takaful	700	9000	2x	2005	No
3.	37	Great Eastern Takaful	200	8000	Did not make any claim for 2023	2017	-
4.	37	BSN Prudential Takaful	500	8000	Did not make any claim since 2020	2012	Yes
5.	38	Great Eastern Takaful	200	8000	Never had experience in claiming since policy taken	2017	-
6.	54	BSN Prudential Takaful	600	10,000	2x	2010	-

From the above table, it is evident that the participants' ages range from 37 to 54 years old, and their preferred health insurance providers are predominantly BSN Prudential Takaful and Great Eastern Takaful. The participants' monthly income falls within the range of RM8,000 to RM10,000, corresponding to a total premium payment varying between RM200 and RM700. Regarding claim activity, a majority of participants did not submit any claims in the current year, 2023, and 1 participant had never claimed from the policy. The policy initiation dates range from 2005 to 2017. Notably, some participants are aware of the application for Co-Takaful or excess, reflecting a shared responsibility in the claim amount among certain cases.

This is supported by a study by Salameh et al. (2015) showed the willingness to pay for health policies associated with the age factor, education level, and income level of academic staff.

5. Conclusion

In conclusion, this study has provided a comprehensive exploration of the factors influencing academicians' decisions to purchase health insurance in Malaysia. The findings reveal a multifaceted decision-making process, shaped by personal experiences, cultural values, social influences, financial considerations, and perceptions of healthcare services.

The first theme, "Personal Experience and Cultural Values and Beliefs in Decision-Making and Challenges," highlights the significant impact of individual experiences with healthcare systems, the influence of family and friends, and the role of social media in shaping perceptions and decisions regarding health insurance.

The second theme, "Socio-economic Factors and the Elevated Medical Expenses," explores the role of income levels, employment status, and financial security in influencing the demand for health insurance. The study emphasizes the challenges faced by individuals in managing monthly premium commitments, especially with premium increases. The rising costs of medical treatments, even within government hospitals, add to the motivation for acquiring health insurance coverage.

The demographic analysis provides the participants' profiles, showcasing variations in age, preferred insurers, monthly income, claim activity, and policy initiation dates. These diverse profiles contribute to a nuanced understanding of how different factors influence health insurance decisions among academicians.

As the landscape of healthcare continues to evolve, with emerging diseases, changing socio-economic dynamics, and evolving healthcare systems, the insights from this study contribute to a deeper understanding of the factors influencing health insurance decisions. This understanding can inform policymakers, insurers, and healthcare providers in tailoring their offerings to better meet the needs of individuals, ultimately contributing to a more resilient and responsive healthcare ecosystem.

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Macroeconomic Forces Affecting Islamic Performance Indices

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Abstract: This study aims to investigate the macroeconomic factors that impact the performance of Malaysia's Islamic stock market. This study looks at six independent variables that affect the performance of the Islamic stock market in Malaysia: the world oil price, inflation rate, Islamic interbank rate, money supply (M2), industrial activity index, inflation rate, Islamic interbank rate, exchange rate, and world oil price. The Department of Statistics Malaysia (DOSM), Bursa Malaysia, Bank Negara Malaysia, and Eikon Thomson Reuters were among the secondary data sources used in this study's quantitative data gathering methodology. The research was carried out over four years (2019–2023) using monthly data. A theoretical model was created to investigate the suggested relationship after it was analyzed using the E-views software. The success of the Islamic stock market was found to be significantly correlated with the inflation rate, money supply, Islamic interbank rate, and exchange rate. These determinants are exerting a direct influence on the Islamic stock market in Malaysia, particularly in its macroeconomic aspects. The present study aims to enhance comprehension regarding the possible effects of different elements on how well the Islamic stock market performs. Different results could come from more research into the various elements affecting the Islamic stock market's performance.

Keywords: *Islamic Stock Market Performance, Money Supply (M2), Industrial Activities Index, Inflation Rate, Islamic Interbank Rate, Exchange Rate, World Oil Price*

1. Introduction and Background

The Kuala Lumpur Composite Index (KLCI), which has been enhanced and renamed the FTSE Bursa Malaysia KLCI, is the criteria used by Bursa Malaysia to determine the FTSE in Malaysia. The index is designed to provide a comprehensive representation of the Malaysian stock market, with a focus on the utilization of free float and liquidity screens to ensure its relevance and appeal for investing purposes. Referring to an Islamic stock market, the main focus is on investing in the shares of companies that are Shariah-compliant. According to Karyatun, Waluyo, and Munir (2021), Shariah-compliant investments aim to generate additional revenue through Shariah principles, ensuring ongoing business continuity through carefully managed investments. This means that the companies in question satisfy certain requirements about their commercial activities, financial dealings, and governance. The restriction of activities such as gambling, interest, and other activities that are thought to be harmful or unethical is included in these criteria. In addition to this, the market places a strong emphasis on being transparent, accountable, and fair in all dealings. One effective strategy for investors to guard against inflation risk is to invest in the stock market, which also serves as a helpful gauge of the nation's economic performance (Khil & Lee, 2000).

The stock market is a significant economic indicator as it produces data that enables economists to forecast forthcoming changes in the economy (Damodoran, 2006). The stock market enables investors to create their investment portfolios effectively, hence promoting high-return investments (Arestis, Demetriades, & Luintel, 2001). Despite the growing prominence of the Islamic stock market globally, various previous research has examined the correlation between normal stock prices and macroeconomic conditions. Few studies have looked into how macroeconomic factors affect the performance of the Islamic stock market. From the past event, there has been a global movement in attention towards capital market-based instruments in Islamic finance, moving away from an emphasis on banks (Dewandaru, Rizvi, Bacha, & Masih, 2014). Malaysia views investors, both private and institutional, who have high standards for their Islamic investments, as being very interested in the Islamic capital market (Arouri, Lahiani & Bellalah, 2010).

A stock market's performance is determined by macroeconomic variables that have been utilized to estimate market fluctuations. In the basic discounted revenue valuation model, changes observed in the stock valuation are influenced. Stock prices are impacted by both fundamental and technical factors. Earnings play a crucial role in determining how investors assess companies, yet various other indicators are employed to forecast stock prices. Investor expectations, attitudes, and sentiments also exert an influence on stock prices (Sukesti, Ghozali & Nurcahyano, 2021). Considering that macroeconomic factors have the potential to impact stock market performance, it is reasonable to expect that there is a relationship between both of them.

This research employs descriptive statistics analysis, correlation coefficient analysis, and regression analysis to assess the influence of six variables: money supply, industrial output, inflation, global oil prices, Islamic interbank rates, and exchange rates. The information was gathered from multiple sources, including The Department of Statistics Malaysia (DOSM), Eikon Thomson Reuters, Bursa Malaysia, Bank Negara Malaysia, and Malaysia's Official open data portal. This research aims to determine the positive and substantial relationship between Islamic stock market performance and several elements which include the world oil price, inflation, industrial production, money supply, Islamic interbank rate, and exchange rate. These results have important ramifications for the Islamic stock market and oil prices.

2. Literature Review

FTSE Bursa Malaysia EMAS Shariah Index: The Islamic stock price in Malaysia is represented in this study by the FTSE Bursa Malaysia EMAS Shariah Index. The Islamic stock market is based on Shariah principles where the activities and components are regulated by Islamic law, which is based on reputable sources and authorized by the Fiqh Ulama (Hussin and Muhammad, 2011). The establishment of the Islamic stock market was based on five fundamental principles which are abstaining from usurious practices, sharing risks, avoiding excessive speculation, ensuring that the akad (contract) complies with the terms, and ensuring that all activities are by Shariah law (Bacha, 2021). Bursa Malaysia, formerly known as the Kuala Lumpur Stock Exchange, launched the Kuala Lumpur Syariah Index (KLSI) on April 17, 1999. This was the first step in facilitating participation in equity investments that adhere to the Shariah principles of Islam.

The Islamic stock price in Malaysia is represented in this study by the FTSE Bursa Malaysia EMAS Shariah Index. The creation of the FTSE Bursa Malaysia EMAS Shariah Index creates additional benchmarking opportunities for portfolios by investors to pursue Shariah investments and enables asset managers to develop novel products that cater to the investment community.

Exchange Rate (ER): According to the portfolio balance approach by Branson (1983) and Frankel (1992), market mechanisms influence exchange rates where fluctuations in stock prices may affect shifts in exchange rates. According to this approach, the stock price should negatively correlate with the exchange rate since falling stock prices lower domestic wealth, which in turn lowers interest rates and domestic money demand (Pan et al., 2007; Caporale et al., 2014).

The price of the stock will be significantly impacted by any changes in the exchange rate. It was suggested by Mukherjee and Naka (1995) and Ibrahim and Aziz (2003) that there is a positive association between these two factors. The relationship between exchange rates and stock prices based on the US and the Pacific Basin was investigated by Phylaktis and Ravazzolo (2005) using data from 1980. The correlation between foreign exchange rates and U.S. stocks is determined to be positive. Additionally, Sohail and Hussain (2009) investigated the relationship, both short- and long-term, between macroeconomic factors and Pakistan's Lahore stock exchange. The finding shows that real effective exchange rates significantly increased stock returns over time.

Meanwhile, Ajayi and Mougoue (1996) extensive investigation of the relationship between exchange rates and stock indices across eight advanced economies, spanning from 1985 to 1991 and using daily data analysis, reveals subtle insights into short- and long-run effects. They reveal a significant negative impact on stock prices in the short term associated with exchange rate increases, reflecting the inherent uncertainty in financial markets. The same finding was drawn by Majid and Yusof (2009) and Hussin et al. (2012), who also showed a negative correlation between stock prices and currency rates. They believe that production costs for domestic

businesses will increase when currency depreciates. Profit and stock values for a company will suffer as a result.
H1: The exchange rate is negatively related to Islamic stock market performance.

Industrial Activities Index: Industrial production is the process involved in the production of commodities and services across various sectors of the economy. These activities range from manufacturing and construction to mining, power generation, and utilities. Industrial operations are defined as the transformation of raw materials or components into finished products or intermediate goods using automated processes that often involve machines, equipment, and technology. In this regard, industrial activity is closely related to Islamic performance indices. Based on previous studies stated if something occurs in industrial activities, it will also change Islamic performance indices which explains the existence of a positive relationship (Engle, Ghysels, & Sohn, 2013; Ratanapakorn & Sharma, 2007; Wongbangpo & Sharma, 2002).

However, Majid & Yusof (2009) present a different perspective. Their research indicates that the fluctuations in Islamic stock values may not be well correlated with industrial activities. This finding indicates that outcomes can diverge from those observed in conventional financial markets within the Islamic market environment.
H2: Industrial production is negatively related to Islamic stock market performance.

Inflation Rate: According to the International Monetary Fund (IMF), inflation is defined as the pace at which the expenses of goods and services increase gradually, hence decreasing the purchasing power of money. The Consumer Price Index (CPI), which looks at the weighted average of prices for a basket of consumer goods and services like food, transportation, and medical care, is how inflation is calculated, according to the U.S. Bureau of Labor Statistics. Other than that, Tandelilin defines inflation as the tendency for overall product prices to rise. The amount of real income that investors receive from their investments is decreased by high inflation.

According to a recent study, inflation lowers the abnormal returns on equities. Consequently, an investor will receive a lower return in the event of rising inflation. An increase in inflation has a negative relationship with stock returns since it is unfavorable for investors even when it raises marginal wealth (Zhang, 2021). Suharyanto and Zaki (2021) claim that from 2016 to 2020, manufacturing companies' stock market performance was significantly impacted negatively by inflation.

However, alternative researchers proposed that there is a positive correlation between these two particulars. The link described as the protective value notion was specified by Khil and Lee (2000), Ibrahim and Aziz (2003), Shabri et al (2001), and Ibrahim and Aziz (2003). Equities act as a safeguard against inflation since they represent ownership rights to tangible goods. When positive movement occurs in the stock market, certain researchers (Hussin et al., 2012; Saryal, 2007; Ibrahim & Aziz, 2003; Shabri et al., 2001; Khil & Lee, 2000) have consistently brought up the idea of value protection. If investors want to diversify their asset rates in the event of inflationary pressures, stock markets may end up being their first option. This is because most businesses have a desire to maintain larger cash flows to maximize their profits, particularly those that have the authority to raise the pricing of their goods rather than the consumers of increasing input costs. According to Hussin et al. (2012), in looking at the Islamic stock market there is a positive relationship between the stock market and inflation. This observation gives validity to the theory that wealth might be secured from the risk of inflation by investing in stocks.
H3: Inflation is negatively related to the Islamic stock market performance.

Islamic Interbank Rate (IIR): The interbank rate refers to the interest rate used to borrow and lend transactions between conventional institutions, as well as the buying and selling transactions between Islamic institutions. The interbank overnight market is particularly significant, serving as a crucial component of a country's monetary and payment system and acting as an essential safety valve for banks. The fluctuation of the interbank rate has a direct impact on the profits and expenses incurred by banks. The findings are expected to serve as valuable resources for banks in Malaysia to utilize in their decision-making processes, enabling them to maintain competitiveness in the interbank money market (Yusuf & Zain, 2020).

Previous studies looking into the correlation between interest rates and stock prices have produced

contradictory results. In the contexts of Malaysia and Indonesia, there is a hypothesis that investors tend to transition their investments from equities to alternative assets when there is an increase in interest rates. This is because the rate signifies different investment alternatives. Long-term bond rates are considered to be a more accurate estimate for discount rates in asset pricing than short-term interest rates (Wongbangpo & Sharma, 2002).

When examining the Islamic stock markets in previous research conducted by Majid and Yusuf (2009) and Hussin (2012), several measures of interest rates were examined. However, Islamic investors should not be influenced by interest rates. The study utilized conventional interest rates as a means of illustrating variations in the domestic money market (Majid & Yusof, 2009). In addition, they included the Federal funds rate (FFR) international interest rate as a statistic to consider outside disturbances. According to their research, there appears to be a direct relationship between the returns of Islamic stocks and both local and foreign interest rates. According to them, investors are not discouraged from buying Shariah-compliant equities by rising yields on interest-bearing instruments because the value of Islamic stocks would increase as interest rates rise. The researchers determined that Islamic interbank rates are not a reliable factor for explaining fluctuations in Islamic stock prices.
H4: Islamic interbank rate is negatively related to the Islamic stock market performance.

Money Supply (M2): Money supply is the total amount of all the country's currency and other assets that can be turned into liquid assets to measure the country's economy. Money supply and Islamic stock price can either be related positively or negatively. This positive relationship between money supply and Islamic stock prices can be noticed through the encouragement of the country's economy (Dhakal et al 1993; Mukherjee & Naka, 1995). As one of the early studies (Friedman, 1976) stated the macroeconomic variable which is the money supply has a positive effect on the dependent variable which is Islamic stock market prices.

When there is a very high increase in the money supply, inflation is very likely to occur and when that happens, the aggregate demand and aggregate supply are also affected in the Islamic stock prices (AD-AS) framework (Keynes, 1973) Islamic stock values will eventually respond constructively to these monetary fluctuations and disruptions, which will have a positive effect on the actual amount of total outputs of the economy. Changes in the money supply have direct positive effects because they might affect investors' decisions to hold onto stocks for a longer period or sell them short. Thus, this circumstance may lead to more extensive economic activity.

According to (Dhakal et al., 1993), the money supply significantly boosts the price of Islamic stocks. Another study (Ibrahim & Aziz, 2003) also proposes the same finding that highlights that money supply needs to be carefully considered while maintaining the structure of monetary policies because money supply could also be employed to stabilize consumer prices. As for the conclusion, money supply indicates a positive influence on the performance of the Islamic stock market.
H5: Money supply is positively related to Islamic stock market performance.

World Oil Price (WOP): According to Bašta and Molnár (2018), crude oil is the most significant commodity in the world, with a weight above 50% in the general commodity index. According to Gisser and Goodwin (1986), an increase in oil prices will have an impact on cash flow because it is a key input used in the production of many commodities and services, such as capital and labor. Increasing oil prices will raise production costs in situations where there is no substitution between elements of production; increased production costs will affect cash flow and lower stock values.

However, a study done by Sadorsky (2003) on the relationship between stock market shocks and changes in U.S. oil prices showed that stock prices were negatively impacted by fluctuations in oil prices. Furthermore, Oberndorfer (2009) examined the relationship between changes in the Euro Zone's energy markets and the prices of energy stock markets in Europe. The study conducted between 2002 and 2007, utilizing both ARCH and GARCH analyses, demonstrated that rising oil prices had negative impacts on European stock returns. Siddiqui and Seth (2015) demonstrated that there is no sustained correlation between oil prices and the Indian stock market. Arouri, Lahiani, and Bellalah (2010) used linear and non-linear models to investigate the relationship between oil price shocks and stock returns among oil-exporting nations between 2005 and 2008. The findings showed that while changes in oil prices in Bahrain and Kuwait did not affect stock returns, they

did show a response to changes in oil prices in Qatar, Oman, Saudi Arabia, and the United Arab Emirates.
H6: World oil price is positively related to Islamic stock market performance.

3. Research Methodology

The objective of this study is to analyze the relationship between the performance of the Islamic stock market and macroeconomic variables using the regression coefficient. The sample used in this study consisted of data from the FTSE Bursa Malaysia EMAS Shariah Index spanning the years 2019 to 2023. The present analysis incorporated secondary data comprising independent variables like money supply, industrial activities index, inflation rate, Islamic interbank rate, exchange rate, and world oil price. This study used time series monthly data as its sample. Several research studies have demonstrated the correlation between the performance of the Islamic stock market performance these six independent variables. The study conducted by Mir Hosseini et al. (2022) revealed a statistically significant positive correlation between the money supply and the performance of the Islamic stock market. Similarly, the study conducted by Park and Ratti (2008) demonstrates a positive correlation between the world oil price and the performance of the Islamic stock market. Meanwhile, Ahmad et al. (2021) conclude that the performance of the Islamic stock market is adversely affected by the inflation rate. In addition, Hussin et al. (2012) present evidence of a negative relationship between exchange rates and stock prices. From the websites of the Department of Statistics Malaysia (DOSM), Bursa Malaysia, Bank Negara Malaysia (BNM), and Eikon Thomson Reuters, data on the FTSE Bursa Malaysia EMAS Shariah Index, money supply, industrial production, inflation rate, Islamic interbank rates, exchange rates, and World oil prices were obtained. Initially, a correlation analysis was conducted to ascertain the correlation between the dependent and independent variables and to investigate the presence of multicollinearity in the regression. The Durbin-Watson test is employed to identify autocorrelation issues. The equation for regression is as follows:

$$\text{FTSE Bursa Malaysia EMAS Shariah Index} = \alpha + \beta 1\ M2 + \beta 2\ IPI + \beta 3\ CPI + \beta 4\ IIR + \beta 5\ ER + \beta 6\ WOP + \varepsilon$$

Where,
M2 = Money Supply
IPI = Industrial Activities Index
CPI = Inflation Rate
IIR = Islamic Interbank Rate
ER = Exchange Rate
WOP = World Oil Price
B1, 2, 3… = coefficient value
ε = error term

4. Results

This section presents results relating to the descriptive statistics of this study, preliminary results consisting of multicollinearity test, normality test, and serial correlation test before presenting and discussing multiple regression results. Table 1 displays descriptive statistics of this research.

Table 1: Descriptive Statistics

Variables	Max	Min	Std Dev	Mean
FTSE Bursa Malaysia EMAS Shariah Index	11705.93	13439.53	10008.03	887.0037
M2 (%)	0.398333	1.680000	-0.490000	0.499587
CPI (%)	1.580000	4.700000	-2.900000	1.969496
IIR (%)	2.394000	3.250000	1.710000	0.577520
ER (RM)	4.290333	4.760000	4.02000	0.200845
WOP (RM)	289.9410	513.6100	78.29000	96.88161
IPI (%)	0.355000	23.70000	-23.40000	5.611925

Note: FTSE Bursa Malaysia EMAS Shariah Index refers to Islamic stock market performance, M2 refers to the money supply, CPI refers to the inflation rate, IIR refers to the Islamic interbank rate, ER refers to the exchange rate, WOP refers to the world oil price, and IPI refers to industrial production.

Descriptive Statistics: Based on Table 1, the FTSE Bursa Malaysia EMAS Shariah Index has a mean value of 11705.93, indicating the average value of this stock market index from 2019 to 2023. The FTSE Bursa Malaysia EMAS Shariah Index, being the dependent variable, is subject to the influence of several independent factors like currency exchange rates, industrial production, inflation rates, interbank rates, money supply, and oil prices. Gaining an understanding of its significance assists in assessing the overall performance of the FTSE Bursa Malaysia EMAS Shariah Index over the designated research period. The FTSE Bursa Malaysia EMAS Shariah Index achieved its peak level of 13439.53 in 2020, being the highest value observed throughout the period in question. As the dependent variable, this peak reflects the most favorable market conditions influenced by the independent variables. According to The Malaysian Reserve, in July 2022, Bursa Malaysia CEO Datuk Muhammad Umar Swift said, "In Malaysia, Islamic banking assets reached US$264.5 billion, making up some 34.2 percent market share from the total banking system assets in 2020," he said during the Invest Shariah Conference 2022 in Bursa Malaysia. He also highlighted that while the Islamic capital market has doubled in size over the decade, by the end of 2020, its Shariah-compliant assets were worth RM2.3 trillion, up from RM1.1 trillion in 2010. On another note, CGS-CIMB Malaysia Research head Ivg Ng pointed out that the FBM Hijrah Shariah Index has outperformed the FTSE Bursa Malaysia KLCI (FBM KLCI) in seven out of the past 11 years (2011-2021). Examining this highest value assists in determining the circumstances in which the FTSE Bursa Malaysia EMAS Shariah Index achieved its optimal performance.

The FTSE Bursa Malaysia EMAS Shariah Index had a minimum value of 10008.03, representing the lowest point attained by the stock market index during the observation period. The trough in question represents the least favorable market conditions that are influenced by the independent variables, serving as the dependent variable. Examining this minimal value aids in determining the circumstances in which the FTSE Bursa Malaysia EMAS Shariah Index performed most poorly, offering a valuable understanding of the elements that contribute to market downturns. The FTSE Bursa Malaysia EMAS Shariah Index has a standard deviation of 887.0037, which reflects the degree of volatility in the stock market index throughout the observed time.

Table 2: Correlation Coefficient Matrix Table

Variable	FTSE	ER	IPI	CPI	IIR	M2	WOP
FTSE	1	.416	0.175	-0.415	-0.598	-0.067	0.374
ER		1	0.019	0.311	0.104	-0.103	0.646
IPI			1	-0.044	-0.123	-0.091	0.070
CPI				1	0.029	0.104	0.729
IIR					1	0.064	0.022
M2						1	0.048
WOP							1

Note: FTSE Bursa Malaysia EMAS Shariah Index refers to Islamic stock market performance, M2 refers to the money supply, CPI refers to the inflation rate, IIR refers to the Islamic interbank rate, ER refers to the exchange rate, WOP refers to the world oil price, and IPI refers to industrial production.

Based on Table 2, this research identified that all the independent variables, which include money supply, industrial production, inflation rate, Islamic interbank rate, exchange rate, and world oil price, exhibited a correlation below the threshold of 0.9. This initial finding is important because it shows that none of the variables are excessively correlated with each other, thus reducing the risk of multicollinearity. However, to ensure the robustness and reliability of these findings, it is essential to perform an additional diagnostic check. This check aims to verify not only whether the independent variables are correlated or not correlated with each other but also to confirm that the correlation values of these variables remain consistently below the threshold of 0.9. This research conducted a Variance Inflation Factor (VIF) test. The VIF test is a widely recognized method for detecting the presence and severity of multicollinearity among independent variables.

Table 3: Variance Inflation Factor test (VIF test)

Variable	Centered VIF
ER	2.006578
IPI	1.057726
CPI	2.505683
IIR	1.054052
M2	1.047076
WOP	3.920698

Note: FTSE Bursa Malaysia EMAS Shariah Index refers to Islamic stock market performance, M2 refers to the money supply, CPI refers to the inflation rate, IIR refers to the Islamic interbank rate, ER refers to the exchange rate, WOP refers to the world oil price, and IPI refers to industrial production.

Based on Table 3, the VIF scores for each of these variables were found to be below the critical threshold of 5 indicating that multicollinearity is not a concern. It shows that all six variables have VIF scores below this threshold and provides strong evidence that multicollinearity is not an issue in this analysis. Therefore, the absence of multicollinearity, as indicated by the VIF test results, supports the validity of including all six independent variables in the time series regression model.

Table 4: Normality Test on residuals

Jarque-Bera	17.37316
Probability	0.000169

Note: FTSE Bursa Malaysia EMAS Shariah Index refers to Islamic stock market performance, M2 refers to the money supply, CPI refers to the inflation rate, IIR refers to the Islamic interbank rate, ER refers to the exchange rate, WOP refers to the world oil price, and IPI refers to industrial production.

A normality test is a statistical procedure used to determine by comparing collected data to the population. The reason for using a normality test is that the data contained in the research has a normal distribution. Based on Table 4, the Jarque Bera is 17.37316 which is the total calculation that includes skewness and kurtosis. Meanwhile, the p-value is 0.000169 which is less than 0.05. Since the p-value is less than 0.05, we have enough evidence to reject H0 because the p-value is significant. However, we can conclude that residuals are not normally distributed for the sample of the time series model. Data may include outliers or extreme values that can heavily influence the distribution shape, resulting in a non-normal distribution.

Table 5: Durbin Watson and Serial Correlation LM Test

Durbin-Watson stat	1.91167
Prob. F	0.0000
Prob. Chi-Square	0.0000

Note: FTSE Bursa Malaysia EMAS Shariah Index refers to Islamic stock market performance, M2 refers to the money supply, CPI refers to the inflation rate, IIR refers to the Islamic interbank rate, ER refers to the exchange rate, WOP refers to the world oil price, and IPI refers to industrial production.

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

Based on the result in Table 5, the Durbin Watson stat is 1.911867 which can be described as having error terms that suffer from 1st order serial correlation. This is because the range of Durbin-Watson stat underlying is in the range of 1.5 to 2.5. It means there is an existence of auto-correlation. Next, based on the Breusch-Godfrey Serial Correlation LM Test, the probability of the Chi-Square stat is 0.000. Since the Chi-Square stat is 0.000 which indicates less than 0.05, there is a presence of auto-correlation and a need to run the Newey-West Test.

Table 6: Multiple Regression Analysis Results (Newey-West Test Checked)

Variable	Hypothesis (+/-)	Result (significant/insignificant)	Probability
Money Supply	Positive Relationship	Significant	0.0162
Industrial Production	Negative Relationship	Insignificant	0.4567
Inflation	Negative Relationship	Significant	0.0620
Islamic Interbank Rate	Negative Relationship	Significant	0.0000
Exchange Rate	Negative Relationship	Significant	0.0741
World Oil Price	Negative Relationship	Insignificant	0.8399
R-squared		0.609579	
Adjusted R-Squared		0.565380	
F-Test		13.79180	
Prob F-stat		0.000000	
Durbin-Watson Test		0.786806	

The F-statistic evaluates if the regression model is significant overall. A high F-statistic, which in Table 6 was 13.79180 here, indicates that the model is statistically significant. This suggests that at least one independent variable has a notable impact on the dependent variable. The p-value related to the F-statistic indicates the probability of observing such extreme F-statistic values if all coefficients were zero. With a p-value of 0.0, the F-statistic is considered statistically significant at any common significance level, providing strong evidence against the null hypothesis and supporting the idea that at least one independent variable significantly affects the dependent variable.

Adjusted R-squared measures the percentage of variance in the dependent variable that can be explained by the currency rate, industrial production, inflation rate, interbank rate, money supply, and oil price in a regression model. A value of 0.565380 for the adjusted R-squared indicates that around 56.54 percent of the variance in the dependent variable can be explained by the independent variables in the model, taking into consideration the number of predictions. Another 43.46 percent was not explained on the regression model, showing that other factors can affect the dependent variable of this research which is Islamic stock market performance indices in Malaysia.

Discussion: Based on Table 6, the regression result probability for money supply is 0.0162. Since 0.0162 < 0.10 which is lower than the threshold of 0.10, then the result is significant. Therefore, we accept the hypothesis that there is a positive and significant relationship between money supply and Islamic stock performances. Based on the results of past studies, this positive relationship between money supply and Islamic stock prices can be noticed through the encouragement of the country's economy (Dhakal et al., 1993; Mukherjee & Naka 1995). The belief is that when there is a change or growth rate of the money supply whether it increases or decreases by an abnormal movement which indicates highly volatile, it warns investors' asset portfolios against becoming out of balance (Rozeff, 1974). When there is a very high increase in the money supply, inflation is very likely to occur and when that happens, the aggregate demand and aggregate supply are also affected in the Islamic stock prices (AD-AS) framework.

Inflation shows a negative significant relationship since the regression result probability is 0.0620 which is lower than the threshold of 0.10. Therefore, we accept the hypothesis that there is a negative significant relationship between inflation and Islamic stock performance. In past studies, inflation lowers the abnormal return on equities (Kumar & Mohanty, 2022). An increase in inflation has a negative relationship with stock returns since it is unfavorable for investors even when it raises marginal wealth (Zhang, 2021). This is supported by the findings of Fama (1981) and Chen et al. (1986) where inflation will raise manufacturing costs and simultaneously reduce the anticipated future cash flow and [profit of the organization.

Meanwhile, the regression result probability for the Islamic interbank rate is 0.00. Since 0.000 < 0.10 which is lower than the threshold of 0.10, then the result is significant. Therefore, we accept the hypothesis that there is a positive significant relationship between the Islamic interbank rate and Islamic stock performance. In past studies we can see Islamic interbank in Malaysia, Bank Negara Malaysia utilizes the interbank money market to implement monetary policy among the country's banks. The market serves three main purposes which are

maintaining liquid assets, fulfilling statutory reserve requirements, and enforcing monetary policies. The efficiency and competitiveness of the market's instruments, coupled with attractive profit rates, have led to increased transaction volumes in Malaysia's interbank money market (Yusuf & Zain, 2020). Therefore, these findings show that the relationship between a dependent variable and the independent variable is the performance of the Islamic stock market in Malaysia and the Islamic interbank rate. This relationship highlights the importance of FTSE in shaping financial market dynamics and underscores the relevance of ongoing research and policy initiatives in this domain.

Lastly, the exchange rate shows a negative significant relationship since the regression result probability is 0.0741 which is lower than the threshold of 0.10. Therefore, we accept the hypothesis that there is a negative significant relationship between exchange rate and Islamic stock performance. A study done by Joseph (2003) shows that an appreciation in exchange rates will decrease exporters' sales and earnings and raise the stock price. Exporters will have an advantage against exporters from other nations, which will boost sales and raise stock prices (Yau and Nieh, 2006). Moreover, a study done by Ajayi and Mougoue (1996) on the relationship between exchange rates and stock indices across eight advanced economies found a significant negative impact on stock prices in the short term associated with exchange rate increases, reflecting the inherent uncertainty in financial markets. The same findings were drawn by Majid and Yusof (2009) and Hussin et al. (2012) where production costs for domestic businesses will increase when currency depreciates. This will make a company suffer on their profit and stock values.

5. Managerial Implications and Recommendations

This research has significant implications for certain parties including Bank Negara Malaysia. The significance of money supply towards Bank Negara in regulating their monetary policy is based on money supply management. The relationship between money supply and Islamic stock prices suggests that an excessive increase in money supply could lead to a potential of rise in inflation in the country. If inflation happens, it could be harmful to the stock market performance, in this research it could be harmful to Islamic stock market performance. By regulating and monitoring the excessive increase of money supply, Bank Negara Malaysia could predict the future performance of the Islamic stock market. This highlights the important role of Bank Negara Malaysia in managing money supply growth to maintain economic stability in Malaysia.

The next party that has a significant implication of money supply in this research is investors. The implication of this research towards investors is on the portfolio management conducted by the investors investing in the Islamic stock market performance. It can be implied by looking at the asset allocation for the investment. The investors might want to adjust or plan their portfolios based on the changes in the money supply growth whether the money supply increases or decreases. The increase in money supply and lower interest rates might prompt a shift from fixed-income securities to equities due to the higher expectations of investors for higher returns.

The other party that also implies the significance of money supply and Islamic stock market performance is Bursa Malaysia. Investing in Islamic or conventional markets is popular these days, with Bursa Malaysia being one of the most reliable platforms. A wide range of investment, capital raising, and exchange-related services are provided by Bursa Malaysia, which also manages and maintains a multi-asset exchange. For the implication of the research, we can look at liquidity and investment. An increase or growth in money supply often leads to more liquidity in the financial system. In most cases, the liquidity in the financial system will provide investors with more funds to invest in the stock market, in this research specifically investing in the Islamic stock market. This could drive up or boost stock prices and also improve the overall market performance.

This research aims to determine the macroeconomic affecting Islamic stock market performance in Malaysia, but it also has limitations. The issue in terms of limitation is due to the data availability and quality itself. Because the Islamic stock market is a new thing compared to conventional stock markets that have been available on the market for a long time, it is quite difficult for researchers to find historical data about the Islamic stock market. About that, most of the data collection that is collected is inconsistent due to different data collection methods which will affect different results and reporting standards. This research also experiences a situation where data sources do not provide information for certain years. This shows that

researchers cannot rely entirely on a single data source and to overcome this problem, researchers need to collect relevant data from various databases and platforms. In this research, macroeconomic forces have been identified as dependent variables and some data for this variable has been collected through Eikon. If the other data is not available or incomplete in Eikon, the researchers will collect data from the relevant website. For example, data for other independent variables such as industrial production has been collected through the International Financial Statistics website.

To address the challenges related to data availability and quality, future researchers can significantly improve data collection methodologies. They should consider diversifying their data sources and platforms to gather comprehensive and reliable data. This entails not only utilizing financial databases such as Eikon and the International Financial Statistics website but also incorporating other reputable sources like Bloomberg, Reuters, and national financial organizations. By expanding the range of data sources, researchers can ensure a more exhaustive and nuanced data set. Additionally, employing another independent variable for different observation periods can reveal patterns in the evolving Islamic capital market in Malaysia. This approach allows for the identification of trends and changes over time, providing deeper insights into market dynamics. Moreover, implementing data standardization techniques is crucial for maintaining consistency in data gathering and analysis. By adhering to established methods for data collection and analysis, researchers can ensure uniformity, which facilitates significant comparisons across different data sets. Establishing a consistent structure for data collection mitigates inconsistencies that often arise from the use of varied data collection methods, thereby enhancing the reliability and validity of research findings.

In addition, another limitation of this research is the gap in understanding the latest developments and trends related to macroeconomic forces affecting Islamic stock market performance is a very large gap due to the lack of recent articles on the issue. Due to this, this research is likely to overlook the existing factors in determining the changes related to Islamic stock market performance and this will lead to errors in drawing Islamic stock market performance trends along with incomplete conclusions. This research literature review has less than 10 articles that discuss Islamic stock performances from 2019, and the above shows that there is a lack of article sources for recent studies in this specific research. Thus, this limitation makes the researchers have to consider using the sources of articles from 2014 and above as references to fulfill the literature review requirement and help to solve this limitation problem. In this research also, there are constraints regarding the explanation of the independent variable of this study and because of that, this research uses articles from other countries such as Indonesia as a reference to this study in terms of alternative data sources and expert opinions that may be used in this study.

Furthermore, researchers can expand the historical data range to provide a more comprehensive analysis of the Islamic stock market. The limitation of the currently available historical data can be addressed by suggesting the use of longitudinal studies. Conducting longitudinal research will allow the monitoring of the performance of the Islamic stock market over an extended period, offering valuable insights into its trends and dynamics. To accomplish this, researchers should initiate data gathering from the inception of the Islamic stock market and ensure that this data is consistently updated over time. In addition, employing data reconstruction techniques can be highly beneficial in predicting missing values and creating a more continuous and robust data series, particularly in cases where historical data is sparse. This approach will enhance the accuracy and reliability of the research findings. Continued study in this area is especially critical in regions like Malaysia, where the Islamic stock market plays a significant role. By focusing on the Malaysian context, researchers can generate more region-specific insights that can inform better investment strategies and policy decisions.

Conclusion: This research focuses on several significant economic indicators that influence the performance of Malaysia's Islamic stock market. It strives to identify the fundamental macroeconomic variables and their effects on Islamic stock performance. This research highlights several key macroeconomic factors, including money supply, interest rates, inflation, exchange rates, Islamic interbank rate, and oil prices for 60 months of data from January 2019 to December 202.

This research uses econometric models to examine data from various macroeconomic indicators and their relationship with the Islamic stock market performance. To evaluate the impact of these factors, statistical techniques such as multiple regression analysis, correlation coefficient analysis, and descriptive statistics

analysis are employed. The findings reveal that money supply, inflation, Islamic interbank rate, and exchange rate have significant influences on Islamic stock market performance. Money supply is the only macroeconomic variable that has a positive relationship with the Islamic stock market performance. As a result, the performance of the Islamic stock market is negatively correlated with interest rates, inflation, currency rates, Islamic interbank rates, and oil prices.

In summary, a number of macroeconomic factors have a major impact on the performance of Malaysia's Islamic stock market. Key factors include the money supply, interest rates, inflation, Islamic interbank rates, exchange rates, and oil prices. Policymakers and investors should take into consideration these factors when making decisions related to the Islamic stock market. The research provides valuable insights for stakeholders in the Islamic finance industry, highlighting the interconnectedness of macroeconomic variables and market performance. Future research could explore other external factors and compare the impacts on conventional versus Islamic stock markets.

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Factors Influencing the Career Advancement of Malaysian Women Homepreneurs on the TikTok Platform

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Abstract: Entrepreneurship significantly contributes to economic growth, with recent studies highlighting the rise of female entrepreneurs who challenge traditional business roles by becoming "homepreneurs." The current research focuses on Malaysian women homepreneurs using TikTok, a platform that has transformed from entertainment to a vital business tool, facilitating unique career advancement opportunities. This study aims to explore the impact of digital marketing skills, product quality, customer engagement, and understanding of TikTok's algorithm on the career advancement of Malaysian women homepreneurs. In the quantitative study focusing on the career advancement of Malaysian women homepreneurs using TikTok, the methodology incorporated structured questionnaires to assess the relationships between key variables. The data was collected from 400 participants via Google Forms, leveraging a purposive sampling technique to ensure a representative sample of women homepreneurs active on TikTok. The statistical analysis revealed that while digital marketing skills and customer engagement did not significantly impact career advancement on TikTok, a thorough understanding of the platform's algorithm was strongly associated with career progression. Conversely, the results indicate that product quality was negatively significant in driving career advancement for Malaysian women homepreneurs on TikTok. This study highlights the need for targeted strategies focusing on product excellence and deep comprehension of platform algorithms to effectively leverage TikTok for career development.

Keywords: *Homepreneurs, Career Advancement, Digital Marketing Skills, Product Quality Customer Engagement, TikTok Algorithm*

1. Introduction and Background

Entrepreneurship has long been linked to economic growth, historically perceived as male-dominated and female-led businesses as small-scale until recent decades. Recent studies highlight the rise of female entrepreneurs in both developed and developing economies, driven by a desire for independence and personal achievement (Abebe & Kegne, 2023; Aparicio et al., 2022; Bose, 2020). This shift has given rise to "homepreneurs," women who operate businesses from home, demonstrating adaptability and resilience (Rout, Panda, & Panda, 2022). Modern digital platforms, especially TikTok, play a crucial role for Malaysian women homepreneurs by providing a space for innovation, audience engagement, and brand establishment (Wahid et al., 2022). According to the Statistica Research Department (2024), the number of TikTok users in Malaysia is projected to increase from roughly 17 million in 2023 to 21.7 million by 2029. This makes TikTok a favorable platform for economic activities. In addition, TikTok's global reach and interactive nature facilitate career advancement through financial growth, brand recognition, and customer loyalty. Rahayu and Ellyanawati (2023) highlighted the limited empirical evidence on the utilization of social media by women entrepreneurs during the pandemic for business sustenance. While studies by Abebe and Kegne (2023) and Rout, Panda, and Panda (2022) have shed light on the broader landscape of female entrepreneurship and digital platforms, a detailed examination of TikTok's role in the entrepreneurial ascent of Malaysian women homepreneurs is conspicuously absent.

Furthermore, Achtenhagen (2017) echoed the need for more research in media management and entrepreneurship, underscoring the scarcity of empirical findings in this domain. The existing literature, while rich in chronicling the evolution of female entrepreneurship, offers limited insights into the intricate dynamics of digital marketing skills in the context of emerging social media platforms as mentioned by Bose (2020), Dsouza and Panakaje (2023) and Swami and Naidu (2020). The TikTok Algorithm, with its profound influence

on content visibility and audience reach, is another area that warrants detailed exploration (Karizat et al., 2021; Nair et al., 2022). Considering these identified gaps, this study aims to unveil the intricate interplay between digital marketing skills, product quality, customer engagement, and TikTok platform understanding in propelling the career advancement of Malaysian women homepreneurs. Thus, this paper seeks to address the following questions. What is the relationship between digital marketing skills, product quality, customer engagement, and TikTok platform understanding towards the career advancement of Malaysian women homepreneurs on TikTok?

2. Literature Review

Career Advancement: Career advancement for Malaysian women homepreneurs on TikTok, as defined by Abebe and Kegne (2023) and Rout, Panda and Panda (2022), comprises business expansion, income increase, and brand recognition, especially on digital platforms. This definition sets the stage for exploring how various factors contribute to women's entrepreneurial success in the digital space. Key factors such as digital marketing skills, customer engagement, product quality, and understanding of TikTok's algorithm play a critical role in their success (Bose, 2019; Annett, 2020). Bose (2019) highlights the empowerment of women homepreneurs through technology despite challenges like low profits and perception issues, while Annett (2020) emphasizes the importance of digital marketing skills and customer engagement for business growth. Typically, career advancement involves a merit-based path within companies, motivating employees (Smith, 2018; Mullins, 2007). However, it also includes alternative pathways based on company demands and individual needs (Saari & Judge, 2004). Career progression offers long-term success, higher compensation, job stability, and job happiness (Dialoke & Nkechi, 2017). Further studies explore challenges such as finance and marketing difficulties, societal constraints, and the role of social capital and digital transformation in the entrepreneurial ecosystem (Bose, 2020; Rout et al., 2022; Setini et al., 2020; Nair & Aithal, 2023). Digital marketing skills are essential for promoting products on digital platforms, empowering women entrepreneurs to leverage social media effectively (Bose, 2019; Swami & Naidu, 2020). While there is extensive literature on the importance of these skills, further exploration is needed on their impact on TikTok (Dwivedi et al., 2021; Tiago et al, 2022; Qureshi et al., 2023; Nambisan and Luo, 2022). This review highlights the critical role of digital marketing skills in career advancement and sets the stage for further empirical investigation into their specific impacts, contributing to the discourse on digital entrepreneurship and women's empowerment.

Digital Marketing Skills: Digital marketing skills are essential for Malaysian women homepreneurs on TikTok, including competencies needed to effectively use digital platforms for promoting and selling products. These skills are critical for success and career advancement in the digital age. Bose (2020) highlights that despite challenges like low profits and perception issues, women can leverage social media for effective marketing, leading to empowerment and business growth. Annett (2020) underscores the importance of digital marketing skills in harnessing the benefits of digital entrepreneurship and enhancing personal and professional satisfaction. However, there is a gap in understanding how these skills specifically impact career advancement on TikTok. Studies by Dwivedi et al. (2021) and Tiago and Veríssimo (2022) emphasize that creative and engaging content is crucial for capturing audience attention, leading to higher engagement and customer loyalty. Qureshi et al. (2023) note that digital marketing skills contribute to business resilience and growth, particularly during economic downturns. As shown by Nambisan & Luo (2022), training programs significantly improve these skills. Therefore, this study aims to explore the specific impacts of digital marketing skills on the career advancement of Malaysian women homepreneurs on TikTok, contributing to the broader discourse on digital entrepreneurship and women's empowerment (Bose, 2019, 2020; Swami & Naidu, 2020). Thus, the following hypothesis is designed:

H^1: *Digital marketing skills are positively related to the career advancement of Malaysian women homepreneurs on TikTok.*

Product Quality: Product quality, as outlined by Swami and Naidu (2020), is the standard or grade of a product that reflects its ability to meet customer needs and expectations. High-quality products lead to positive reviews, repeat purchases, and referrals, which are vital for homepreneurs' success (Swami & Naidu, 2020). Dsouza and Panakaje (2023) emphasize the pivotal role of product quality alongside digital marketing and customer engagement in business performance. Similarly, Susanti et al. (2023) highlight that product quality, combined with digital transformation and innovation, enhances the competitive advantage of Micro, Small and Medium

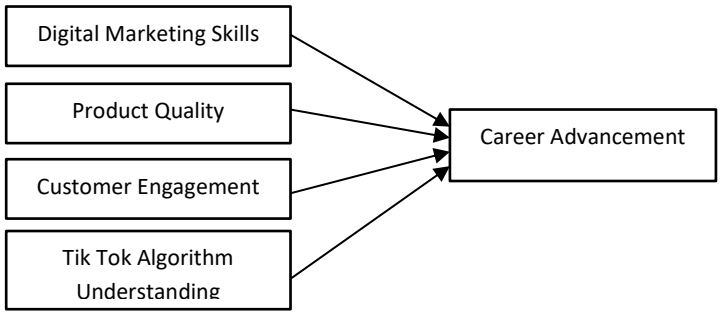
Enterprises (MSMEs). Bose (2020) notes the challenges women entrepreneurs face regarding product quality, which can affect market perception. Overcoming these challenges through improved product quality can lead to better market acceptance and growth. However, there is a gap in understanding how product quality specifically impacts the career advancement of Malaysian women homepreneurs on TikTok. This literature review underscores the critical role of product quality in career advancement and sets the stage for further empirical investigation into its impact on digital entrepreneurship (Swami & Naidu, 2020; Dsouza & Panakaje, 2023; Susanti et al., 2023; Bose, 2020). Hence, the current study suggests the following hypothesis:
H²: *Product quality positively influences the career advancement of Malaysian women's homepreneurs on TikTok.*

Customer Engagement: Customer engagement is a dynamic, interactive process that builds relationships, trust, and community between businesses and customers (Poell et al., 2021). Studies by Bose (2019) and Swami and Naidu (2020) highlight the importance of customer engagement in creating a loyal customer base and enhancing brand visibility, which is crucial for business visibility and growth on TikTok. The significance of customer engagement in the digital marketplace is increasingly recognized as a critical factor for business success. Studies by Bose (2019) and Annett (2020) have highlighted the transformative power of digital platforms in enabling women entrepreneurs to connect with a broader audience. These connections fostered through engagement, are not merely transactional but are deeply rooted in building relationships, trust, and community. Despite existing literature, there remains a gap in understanding the specific dynamics of customer engagement among Malaysian women homepreneurs on TikTok. This study aims to address this gap by exploring how customer engagement strategies on TikTok influence the career advancement of these entrepreneurs. This study contributes to the broader discourse on digital entrepreneurship, women's empowerment, and the transformative power of customer engagement in the digital age (Poell et al., 2021; Bose, 2019, 2020; Swami & Naidu, 2020).
H³: *There is a significant relationship between customer engagement and the career advancement of Malaysian women homepreneurs on TikTok.*

TikTok Algorithm Understanding: The algorithm's comprehension allows entrepreneurs to maximize their presence on the platform, shaping content reach and engagement to enhance digital marketing efforts (Karizat et al., 2021; Nair et al., 2022). Studies by Srivastava and Sharma (2020) and Dsouza and Panakaje (2023) emphasize the importance of algorithm knowledge in crafting effective marketing strategies, enabling homepreneurs to align their content with the algorithm's preferences and increase their audience reach. Despite the general insights available, there is a notable gap in specific research on how understanding TikTok's algorithm impacts the career advancement of Malaysian women homepreneurs. This study aims to fill that gap by exploring how algorithm knowledge influences content strategy and audience engagement, contributing to entrepreneurial success. Doing so provides valuable insights into digital entrepreneurship and practical strategies for leveraging TikTok for business growth and personal branding (Karizat et al., 2021; Nair et al., 2022).
H⁴: *Understanding the TikTok algorithm positively influences the career advancement of Malaysian women's homepreneurs on TikTok.*

Based on the discussion above, this study derived a research conceptual framework, illustrated in Figure 1. Digital marketing skills, product quality, customer engagement, and understanding of the TikTok algorithm are the independent variables, while career advancement is the dependent variable.

Figure 1: Research Framework



3. Research Methodology

This study uses a quantitative research approach to examine how various factors affect the career advancement of Malaysian women homepreneurs on TikTok. Quantitative methods are well-suited for this research because they provide reliable and generalizable data through precise measurements and statistical analysis (Creswell & Creswell, 2017; Mertler & Reinhart, 2016). A purposive random sampling technique was utilized where the target respondents were Malaysian female home entrepreneurs active on TikTok. An online survey questionnaire fits well in this study with their digital-based businesses, and the online setting matches the participants' daily activities, such as promoting products and interacting with customers, which helps gather relevant data. Using familiar platforms like TikTok for data collection minimizes disruptions and increases engagement. This study's sample size is 385, based on a population of 2,700 members from the Women Homepreneur Malaysia page. This number was calculated using the Krejcie and Morgan (1970) table, which helps determine an appropriate sample size to ensure reliable results. However, within three weeks, the study collected more than 100% of the responses, with 407 responses. However, after data screening, cleaning, and validations, 400 responses were valid for analysis. The five-point Likert scale used in the questionnaire is as follows: 1-Strongly Disagree, 2-Disagree, 3-Neutral, 4-Agree, 5-Strongly Agree. This research applied SPSS 28.0 to analyze the data and test the hypotheses.

4. Results

The data were analyzed using descriptive, correlation, and regression analysis. Descriptive analysis was used to analyze the survey results, and frequency analysis was conducted to describe the demographic profiles of the respondents. Meanwhile, correlation analysis was used to test the relationship between the variables, and multiple regression analysis was used to evaluate the strength and direction of the relationship between various variables.

Profile of Respondents: Table 1 summarizes the respondents' demographic profiles. According to the table, all respondents were female since the study focused on women homepreneurs. Most of the respondents were aged between 35-44 years old (44%), followed by those aged below 25 years old (23%) and 25-34 years old (21.5%). In addition, most of the respondents hold a Diploma (57%) and a Master's (26.8%). For the years of business experience, the majority of them have below five years of experience as homepreneurs, with 55 percent, while 27.5 percent of them have 6-10 years of business experience. For the income category, it can be concluded that most of the respondents' monthly income range is between RM3000-RM3999 (42.5%), followed by RM5000 and above (25.8%) and RM4000-RM4999 (18.8%).

Table 1: Respondent Demographic

Characteristics	Categories	Frequency	Percentage (%)
Gender	Female	400	100.0
Age Group	Under 25 years old	92	23.0
	25 - 34 years old	86	21.5
	35 - 44 years old	176	44.0
	45 - 54 years old	43	10.8
	55 years old and above	3	0.8
Highest Level of Education	Diploma	228	57.0
	Degree	49	12.3
	Master	107	26.8
	PhD	16	4.0
Years of Business Experience	5 years or below	220	55.0
	6 - 10 years	110	27.5
	11 - 15 years	35	8.8
	Above 16 years	35	8.8
Monthly Income Range	RM2000 - RM2999	52	13.0
	RM3000 - RM3999	170	42.5
	RM4000 - RM4999	75	18.8
	RM5000 and above	103	25.8

Descriptive Statistic Results: Table 2 shows that the descriptive statistics indicate generally high ratings and moderate variability among the respondents. Digital Marketing Skills had a mean score of 4.11 (SD=0.696) showing that respondents generally rated their skills highly with some variation. Product Quality received a mean of 4.13 (SD= 0.643), suggesting a consistent perception of high-quality products. Customer Engagement had a mean of 4.12 (SD= 0.701), indicating a high level of engagement with slightly more variability. Understanding of the TikTok algorithm had a mean of 4.04 (SD= 0.645), reflecting a strong and moderately consistent understanding among respondents. Lastly, Career Advancement had a mean of 4.0908 (SD= 0.659), indicating positive feelings about career progression with moderate variability. Overall, the participants rated all variables favorably, with mean values above four on a 5-point scale.

Table 2: Descriptive Statistics Results

Variable	N	Mean	Standard Deviation
Digital Marketing Skills	400	4.11	0.696
Product Quality	400	4.13	0.643
Customer Engagement	400	4.12	0.701
TikTok Algorithm Understanding	400	4.04	0.645
Career Advancement	400	4.09	0.659

Reliability Analysis: The reliability test results in Table 3 demonstrate high internal consistency for all variables, indicated by their Cronbach's Alpha values. Digital Marketing Skills (IV1) has a Cronbach's Alpha of 0.873, showing excellent reliability. Product Quality (IV2) has a strong reliability with a Cronbach's Alpha of 0.840. Customer Engagement (IV3) exhibits the highest reliability with a Cronbach's Alpha of 0.897. TikTok Algorithm Understanding (IV4) and Career Advancement (DV) show robust reliability, with Cronbach's Alpha values of 0.822 and 0.852, respectively. These high-reliability coefficients confirm that the survey items used to measure each variable are consistent and reliable, validating the data collected for analyzing the factors influencing the career advancement of Malaysian women homepreneurs on TikTok.

Table 3: Reliability Test Results

Variables	Cronbach's Alpha
Digital Marketing Skills (IV1)	0.873
Product Quality (IV2)	0.840
Customer Engagement (IV3)	0.897
TikTok Algorithm Understanding (IV4)	0.822
Career Advancement (DV)	0.852

Relationship between Variables: Pearson's correlation analysis has been used to test the relationships between the independent variables (Digital Marketing Skills, Product Quality, Customer Engagement, and TikTok Algorithm Understanding) and the dependent variable (Career Advancement). Referring to Table 4, it can be concluded that Digital Marketing Skills (0.179) and Product Quality (0.171) have a weak positive relationship, Customer Engagement (0.233) has a low positive relationship, while TikTok Algorithm Understanding with a coefficient of 0.410, indicating a moderate positive relationship. These findings suggest that understanding the TikTok algorithm is the most critical factor in enhancing the career advancement of Malaysian women homepreneurs on TikTok. At the same time, digital marketing skills, product quality, and customer engagement have weaker impacts.

Table 4: Pearson's Correlation

Variables	Pearson Correlation
Digital Marketing Skills	0.179
Product Quality	0.171
Customer Engagement	0.233
TikTok Algorithm Understanding	0.410

Regression Analysis: The regression analysis was used to explain the impact of changes in the independent variables on the dependent variable. Table 5 shows that the independent variables-TikTok Algorithm Understanding, Digital Marketing Skills, Customer Engagement, and Product Quality account for 18% of the variance in Career Advancement. The R-value of 0.424 signifies a moderate positive correlation between the combined predictors and Career Advancement. Meanwhile, Table 6 shows the outcome from the regression analysis that highlighted the TikTok Algorithm Understanding has a significant positive relationship with Career Advancement ($p = 0.001$), and Product Quality has a significant negative relationship with Career Advancement ($p= 0.035$). However, Digital Marketing Skills ($p = 0.671$) and Customer Engagement ($p = 0.303$) have no significant relationship with Career Advancement. The Beta Coefficient explained the relative importance of the factors in terms of their contribution to the variance. Of all four factors, TikTok Algorithm Understanding ($\beta = 0.459$) carried the heaviest weight in explaining career advancement. Overall, understanding the TikTok Algorithm positively affects career advancement. At the same time, product quality has a significant negative effect, and digital marketing skills and customer engagement do not significantly influence career advancement in this context.

Table 5: Model Summary of Regression

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.424	0.180	0.171	0.59969

Table 6: Regression Analysis Results

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.572	0.221		11.647	<0.001
Digital Marketing Skills	0.026	0.061	0.027	0.425	0.671
Product Quality	-0.192	0.091	-0.187	-2.11	0.035
Customer Engagement	0.076	0.073	0.081	1.032	0.303
TikTok Algorithm Understanding	0.468	0.062	0.459	7.666	<0.001

5. Discussion and Conclusion

This study aims to understand the relationships between digital marketing skills, product quality, customer engagement, and TikTok algorithm mastery and their impact on women homepreneur's career advancement. Regarding digital marketing skills, the study found no significant relationship with career advancement. Despite the common belief that digital marketing should enhance business growth, the unique nature of TikTok, which emphasizes creative content and viral trends, may diminish the impact of traditional digital marketing strategies. This suggests that standard digital marketing competencies are necessary but insufficient for career advancement on TikTok. Studies by Annett (2020) and Bose (2019) have highlighted the challenges posed by

rapidly changing digital landscapes and the unique demands of platforms like TikTok, which may not align perfectly with traditional marketing skill sets. Additionally, Nair and Aithal (2023) suggest that cultural and technological barriers can significantly shape the business practices and success rates of digital entrepreneurs in specific regions. Furthermore, although previous studies show that high-quality products contribute to a strong brand reputation and customer trust (Swami & Naidu, 2020; Susanti, 2023), the study found a negative coefficient for product quality, suggesting that an overemphasis on product perfection might divert focus from other critical business activities. When examining customer engagement, the finding was not significant, thus confirming that while engagement increases visibility, it may not necessarily convert to tangible business growth or career advancement. The transient nature of TikTok trends and the platform's algorithm may overshadow the effects of engagement alone. Lastly, the study found a significant relationship between understanding the TikTok algorithm and career advancement. Mastering the algorithm is crucial for enhancing content visibility and engagement. This finding underscores the importance of aligning marketing strategies with algorithmic preferences for success in digital entrepreneurship. As noted by Karizat et al. (2021) and Nair et al. (2022), understanding and adapting to the algorithmic preferences of TikTok can significantly enhance content visibility, thereby amplifying the impact of product quality on market reach and consumer engagement.

This study provides valuable insights into the factors influencing the career advancement of Malaysian women homepreneurs on TikTok, revealing that while digital marketing skills are important, they must be paired with strategic content creation and algorithm alignment to enhance career success. The significant impact of product quality on business success is underscored, especially in the visually-driven TikTok environment, while the expected direct link between customer engagement and career advancement was not supported, suggesting that engagement alone may not drive business growth without effective conversion strategies. The study's implications span entrepreneurs, educators, policymakers, and digital platform developers, highlighting the need for a comprehensive approach to support women's entrepreneurship in digital contexts. Future research should broaden the demographic scope, integrate qualitative methods for deeper insights, and adopt longitudinal approaches to track evolving digital trends. This research enriches the understanding of how TikTok can aid Malaysian women homepreneurs' career growth, offering theoretical and practical insights to enhance entrepreneurial strategies in the digital age.

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Aligning Enterprise Risk Management into Risk Disclosure of the IPO Prospectus

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Abstract: This concept paper aims to review the potential of aligning Enterprise Risk Management (ERM) elements into risk disclosure of the IPO prospectus. This concept paper explores the potential for aligning ERM elements within the risk disclosure section of IPO prospectuses. The paper emphasizes the regulatory requirement of the risk disclosure in the prospectus. It highlights the importance of risk disclosure in investment decision-making. It contends the best practices of risk disclosure in the IPO prospectus for the benefit of investors and also reinforces the issuing company's commitment to effective risk management and corporate governance. By incorporating ERM principles, the prospectus not only improves transparency but also strengthens the issuing company's commitment to effective risk management and corporate governance. The key research objective is to evaluate the integration of ERM into IPO risk disclosures, with particular emphasis on regulatory compliance, investor decision-making, and the enhancement of corporate governance practices. This research endeavors to fill the gap in the literature by enhancing the ERM elements in the existing practices of IPO disclosure.

Keywords: *Risk disclosure, Enterprise Risk Management, risk assessment, risk mitigation, investment decision*

1. Introduction and Background

In Initial Public Offerings (IPOs), the prospectus is a critical document that serves as a comprehensive guide for potential investors. It provides essential information about the company, including financial statements, business strategy, and details of issuance. Aligning the Enterprise Risk Management (ERM) perspective within the IPO prospectus is fundamental to ensuring that risk disclosures are both accurate and meaningful. This alignment not only aids in investor decision-making but also reinforces the company's commitment to information transparency and prudent risk management. Risk disclosure provides investors with a clear understanding of the risk associated with the IPO. This transparency assists investors in making informed decisions and avoiding misleading information. Detailed risk disclosure allows investors to evaluate the upsides and downsides of IPO investing, which in turn facilitates investors to evaluate potential return on investment.

ERM is a holistic approach to identifying, assessing, and managing risks across an organization. Unlike traditional risk management, which might focus on specific risks in isolation, ERM integrates risk management into the company's overall strategic planning. It emphasizes the identification of risks across all aspects of the business such as strategic, operational, financial, and compliance as well as their potential impacts on the company's objectives.

The integration of ERM into prospectus disclosures ensures that investors have a comprehensive view of the risks that could affect the company's performance, enhancing both transparency and investor confidence. A strong legal framework and empirical validation are necessary for the effective incorporation of ERM into IPO prospectuses. Previous studies have shown that robust ERM practices can improve risk disclosure quality, providing investors with a more accurate understanding of risk exposure (Beasley et al., 2005; Hoyt and Liebenberg, 2011). Incorporating these insights strengthens the credibility of risk disclosures and aligns with best practices in corporate governance. By referencing empirical research, the prospectus can more effectively illustrate the benefits of ERM integration in supporting informed investment decisions and safeguarding investor interests.

2. Risk disclosure and capital market regulatory requirements

Regulatory requirements for risk disclosure in IPO prospectuses are crucial for ensuring that potential investors receive accurate, comprehensive, and transparent information about the risks associated with investing in a company. Risk disclosure provides some form of investor protection as it provides investors with the necessary information to make informed decisions. The Securities Commission (SC) of Malaysia has stringent requirements for risk disclosure in IPO prospectus and ensures regulatory monitoring to ensure that the issuing company meets regulatory standards and avoids potential legal issues. The comprehensive disclosure of risks includes a variety of categories, such as operational, financial, and legal risks. These details allow investors to assess the potential impact of these risks on their investments. The purpose is not only to protect investors but also to foster market transparency and trust between the issuing company and its stakeholders. Accurate and thorough risk disclosure is critical to market stability and reduces the likelihood of investors being misled by incomplete or incorrect information.

In a broader context, Malaysia's regulatory framework shares similarities with other markets, particularly in the ASEAN region, but also exhibits distinct differences. While regional markets impose their own set of regulations, the extent of Enterprise Risk Management (ERM) integration varies. Malaysia's maturing ERM framework aims to improve corporate governance and ensure that risk disclosure is aligned with international standards. Malaysia can further enhance investor protection by strengthening its regulatory practices, focusing on the integration of ERM into IPO disclosures. This would support market confidence, reinforce the issuing company's commitment to effective risk management, and promote sustainable corporate governance. By advancing its framework, Malaysia can enhance transparency and accountability, benefiting both investors and the broader financial ecosystem.

Section 236(1) (a) of the Capital Markets and Services Act 2007 states that a prospectus should contain all information that investors would reasonably require, and reasonably expect to make an informed assessment of the merits of investing in the securities and the extent of the risk involved. In addition, Capital Market Masterplan 2 outlines the governance strategies of enhancing product regulation to ensure robust governance in managing risk. A progressive shift from merit assessment to disclosure-based regulation enhances the disclosure of information to investors. The master plan set out for a risk-based assessment process in the establishment of new financial products, whose aim is for greater transparency and assurance to the investors. The process is concentrated on risk assessment and risk mitigation through internal controls and regulatory requirements for disclosures and accountabilities.

Specifically, the SC's Prospectus Guideline requires the inclusion of specific sections dedicated to risk factors. This section must disclose the material risks that could impact the company's operations, financial performance, and the investment's value. The risk factors section outlines risk aspects of the corporation's business operations, financial position, and shareholders' investments in the corporation. The Guideline highlights several requirements among others; similar risk factors should be grouped, and listed in descending hierarchical orders depending on their level of severity. The risk statement should be presented in detail and tailored to the company's specific risks and circumstances.

3. Risk and Investment Decision

Risk-return trade-off serves as a basic principle in investment decisions. It suggests a positive relationship exists between risk and return. Investors increase their required rate of return as perceived risk (uncertainty) on the investment increases. Investors would select investments that are consistent with their risk preferences. Some would consider low-risk investments, whereas others wanted high-risk investments.

Investor's risk preference also depends on the investor's lifetime. Individuals in the accumulation phase (early to middle years of working careers) are typically willing to assume relatively high-risk investments in the hope of making above-average returns. Individuals in the consolidation phase (midpoint of careers) are willing to assume moderate risk and may not want to take abnormally high risk. Individuals in the spending phase (retirees) prefer to have a less risky portfolio.

Investor's lifecycle determines appropriate investment goals, commensurate with a certain level of risk. Near-term, high priorities are shorter-term financial objectives such as funds for a house down payment or vacation trip. Thus, low-risk investments (fixed-income securities) are considered suitable for achieving those financial objectives. Long-term, high-priority goals include financial independence and the ability to retire at a certain age. Due to their long-term nature, higher-risk investments (equities) can help meet these objectives. Lower priority goals involve desirable objectives but are not critical. For example, luxury vacations, redecorating the home, or a new car every few years. Thus, a combination of risky and less risky financial assets may satisfy the financial objectives.

4. Aligning Enterprise Risk Management in the Risk Disclosure

Enterprise Risk Management (ERM) is defined as a process by the Board of Directors, management, and employees, establishing a strategy for the company, identifying potential events (risk) that could affect the company, and managing risks aligned with the company's risk profile, to provide reasonable assurance towards achieving company's objectives (COSO, 2017). Meanwhile, ISO 31000:2018 defines the risk management process as "coordinated activities to direct and control an organization about risk". It also defines the risk management framework as "a set of components that serve as the foundations and organizational arrangements for designing, implementing, monitoring, reviewing, and continuously improving risk management throughout the organization."

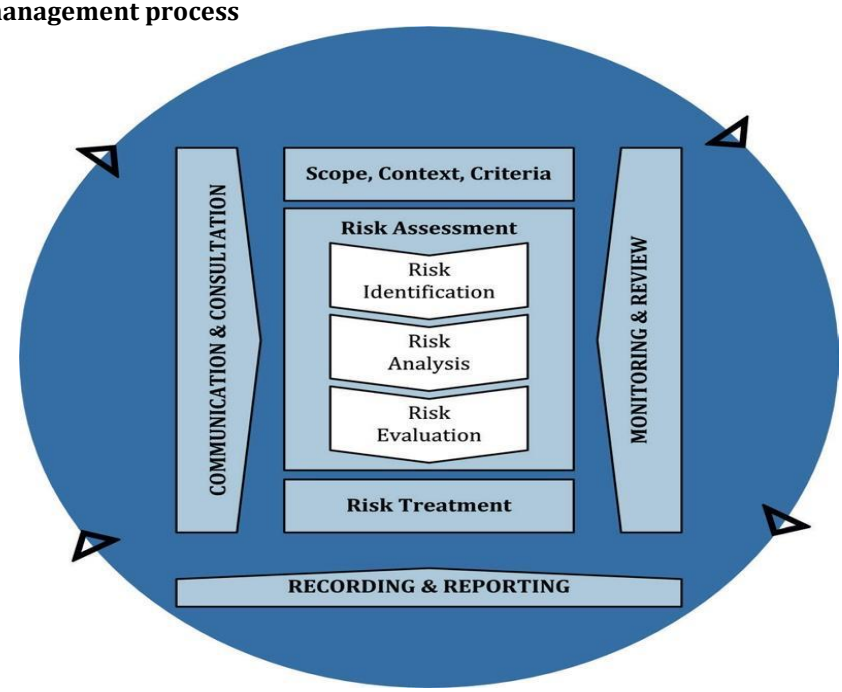
Investors need to perform risk evaluation by analyzing the potential loss or volatility that aligns with their risk preference and financial goals. The propensity of investors to invest should be focused more on managing risk rather than on managing return. Thus, risk drives return. Prospectus serves as a platform for communicating the company's approach to risk management and how it integrates with the overall business strategy. A robust ERM framework presented in the prospectus can highlight the company's proactive approach to risk mitigation and strategic foresight.

Previous empirical studies have demonstrated a connection between Enterprise Risk Management (ERM) and the financial reporting process. Cohen et al. (2017) in their seminal work, highlighted a strong link between ERM and financial reporting. Shad et al. (2019) proposed an integrated approach, combining ERM implementation with sustainability reporting to assess its effect on business performance. However, more empirical evidence is needed to draw a general conclusion (Anton and Nucu, 2020).

The prospectus should outline the company's risk management practices and strategies. This includes how risks are monitored, the roles and responsibilities of the risk management team, and how the company plans to mitigate or manage these risks. The IPO prospectus should focus on the quality and consistency of risk disclosures. The prospectus should provide clear, specific, and quantitative risk information that is material to the investors.

The following Figure 1 illustrates the risk management process under ERM practices. The risk management process involves systematic application of policies, procedures, and practices into six elements of the risk process namely establishing the context, assessing, treating, monitoring, reviewing, as well as reporting. Risk disclosure of the IPO prospectus should be focused on risk assessment and risk mitigation (treatment).

Figure 1: Risk management process



Source: ISO 31000:2018

Aligning ERM with IPO prospectus is crucial to ensure investor confidence and transparency. A well-aligned ERM perspective ensures that the risk disclosures are comprehensive, coherent, and reflective of the company's actual risk management practices. This transparency builds investor confidence and can reduce perceived uncertainty. The risk disclosures in the prospectus must be aligned with the company's strategic objectives. The ERM perspective should reflect how the company's risk management practices support and enable its strategic goals. This alignment helps investors see the connection between risk management and business success. Risk management practices in the context of should align with the company's overall business strategy.

5. ERM-Based Risk Disclosure

Information on risk management is non-financial information that is strictly necessary for investors (Faisal et al, 2012). The lack of non-financial risk information can cause investors to make poorly informed decisions during the investment process (Abdullah et al., 2015). Grover and Bhullar (2021) claim there is a scarcity of relevant risk categories disclosed to the public through IPO risk disclosures and further argue for the paucity of empirical research to provide evidence on the influence of risk disclosure in IPO performance. Ng and Lee (2019) conclude that there is insufficient risk information in the prospectuses of Malaysia, suggesting that Malaysian company management would not be willing or able to provide the public with accurate and pertinent information through an IPO prospectus. These findings shed into the limelight the need to engage with international standards (ERM) in the context of the IPO prospectus.

Aligning ERM into an IPO prospectus involves a comprehensive and transparent view of risk management practices. The scope of risk disclosure that needs to be included in the prospectus includes risk identification, risk assessment, and risk mitigation. Risk identification describes how risks are being identified across various areas of the business. Common risk categories include financial, legal and compliance, operational, project, reputational, strategic, and technology. Risk assessment involves the evaluation of risks in terms of their potential impact and possibility of occurrences. Risk mitigation includes details of risk control to reduce the likelihood of occurrences and potential disasters. Overall, risk disclosure in the prospectus is part of risk reporting to the potential shareholders of the company.

Risk disclosure in the IPO prospectus should also outline the risk mitigation strategies. This is to ensure that the identified risk can be managed properly and effectively. A well-structured risk mitigation plan may reduce

the likelihood of the risk occurrences and the impact of those risks. A risk mitigation plan enables investors to prepare for due diligence before investing in the IPO potentially leading to more accurate company analysis and evaluation. It also enables investors to make informed investment decisions. Furthermore, a risk mitigation plan may demonstrate a company's transparency and commitment to address the risks, thus reducing the perception of uncertainty that eventually builds trust with investors.

The SC has published a section called Prospectus Exposure on its website to seek comments from the public. The risk disclosure (risk factors) is specifically assigned under a specific section in the IPO prospectus. The risk factors are categorized under three categories namely risk relating to business operations, industry, and shares issuance. However, a mitigation plan for each risk disclosure is in vain.

Conclusion

Aligning the Enterprise Risk Management perspective with the IPO prospectus is a critical component of successful public offerings. It ensures that risk disclosures are comprehensive, transparent, and aligned with the company's strategic objectives. By adopting best practices and addressing potential challenges, companies can enhance investor confidence, meet regulatory requirements, and ultimately support a successful IPO process. This alignment not only benefits investors but also reinforces the company's commitment to effective risk management and corporate governance. The above discussion sheds light on a new research agenda to align ERM into the risk disclosure of the IPO prospectus. The future endeavor may look into the potential of aligning the risk management process in the IPO prospectus.

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Exploring E-Customer Satisfaction Using e-SERVQUAL Among Online Shoppers

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Abstract: When interacting with a company's products and services, customer satisfaction is an overall feeling of contentment that a client is experiencing. Previous studies have shown an increase in revenue when a company prioritizes customer satisfaction with its products or services. Around 70 percent of Malaysians are dynamic online consumers, with most of them shopping via websites. e-SERVQUAL assesses the efficacy and efficiency of a website in facilitating shopping, purchase, and delivery processes. It encompasses the pre-purchase and post-purchase phases. The e-SERVQUAL dimensions (privacy, website design, responsiveness, reliability, usability, and information quality) are elements that impact e-customer satisfaction. A total of 100 respondents at Bandar Utama City Centre who shop online participated in the survey. According to the data, males outnumber females among the respondents. The survey comprised three sections: A, B, and C. Section A comprised the demographic information of the respondents, Section B concentrated on the e-SERVQUAL aspects, and Section C addressed e-customer satisfaction. The data was examined utilizing the Statistical Package for the Social Sciences (SPSS). The results indicated that the majority of respondents expressed satisfaction with the quality. However, website design improvements should be made to encourage more online shopping. The recommendation in this study is beneficial to online service providers and future studies on e-SERVQUAL should be extended to another dimension to explore more aspects of determining quality service in an online setting.

Keywords: *eCustomer Satisfaction, eSERVQUAL, Privacy, Website Design, Responsiveness, Reliability, Usability, Information Quality*

1. Introduction and Background

Electronic trade indicates the execution of commercial transactions between businesses and consumers via electronic platforms, such as the Internet. Companies are increasingly employing this business channel to compete with their competitors in the online marketplace. Business-to-consumer (B2C) constitutes a fundamental category of transactions within e-commerce. Consequently, contemporary consumers can place orders via several platforms and payment methods from the convenience of their homes and await delivery to their doorsteps (Rita Oliveira & Farisa, 2019). Courier services available through internet-enabled devices, such as laptops and mobile phones, facilitate the efficient delivery of commodities, including merchandise and foodstuffs (Wirapraja, Aribowo, & Setyoadi, 2021). Amjad-ur Rehman, Qayyum, and Javed (2019) also provide support for this argument, stating that online purchasing enables customers to conduct their shopping activities more effectively and efficiently.

The Internet has become an essential tool for conducting business today, and offering quality information and technology services to clients has become one of firms' key aims (Baber, 2019). To support this, 80 percent of Malaysia's population was active Internet users in 2021, with mobile phone penetration at 84.2 percent (MATRADE, 2022). According to the Department of Statistics Malaysia (DOSM, 2021), e-commerce revenue reached RM801.2 billion, up 23.1 percent from 2020.

Consequently, the rise in e-commerce platform usage in Malaysia requires an understanding of consumer satisfaction levels. In the electronic context, consumer satisfaction is referred to as e-satisfaction. Anderson and Srinivasan (2003) define e-satisfaction as the fulfillment experienced by consumers during online shopping, especially within the B2C market. The study indicates a strong and significant correlation between e-SERVQUAL and e-satisfaction in the context of e-commerce. E-service quality indicates the online services offered to customers, who view internet-based services as more efficient in terms of time and cost for conducting transactions (Juwaini et al., 2022). Alam (2020) defines service quality as a business's ability to

provide services associated with products, processes, and the environment that fulfill consumer expectations. The quality of a company's services significantly influences customer satisfaction, with the quality of e-services determining consumer satisfaction or dissatisfaction (Komara & Ariningrum, 2013).

2. Literature Review

e-Service Quality (e-SERVQUAL)

e-SERVQUAL is characterized as the degree to which a website supports efficient and effective buying, purchasing, and delivery (Parasuraman et al., 2005). This definition clarifies that the e-SERVQUAL concept encompasses both the pre-purchase phase (including ease of use, product information, ordering information, and personal information protection) and the post-purchase phase (comprising shipping, customer support, fulfillment, and return policy). Parasuraman et al. (2005) assert that the examination of e-SERVQUAL necessitates the creation of scales that surpass the adaptation of traditional offline scales.

Santos (2003) defined e-SERVQUAL as the comprehensive assessments and evaluations of the quality and excellence of e-service delivery in the digital marketplace. Research conducted over the last twenty years has demonstrated that service quality affects consumer choices; however, these insights have only recently been utilized in the context of e-commerce (Ilieva, Yankova, Klisarova, & Dzhabarova, 2022).

Furthermore, high-standard e-SERVQUAL signifies the means through which potential advantages can be actualized for online consumers (Yang, 2001). The online comparison of product specifications and costs is far more convenient than through traditional methods, making e-SERVQUAL a crucial element for consumers (Santos, 2003). Consequently, online consumers anticipate a standard of service quality that meets or exceeds that of traditional channel consumers. Collier and Bienstock (2006) define e-service quality as customers' perceptions of service outcomes and their recovery perceptions in the event of an issue.

e-Service Quality Dimension

The revised SERVQUAL scale items were utilized in this study to determine the dimensions of e-service quality through information quality, efficiency, security and privacy, responsiveness, website design, and reliability. The relationship between e-service quality dimensions, overall service quality, and customer satisfaction is suggested and examined below:

When it comes to traditional SERVQUAL instruments, reliability is crucial. Yang et al. (2005) define it as the execution of a promised service accurately and promptly, along with the delivery of intact and correct items at times suitable for clients. Perceptions of reliability are influenced by the proper technical operation of the site and the user interface's technical features, whereas the outcome aspect is determined by the accuracy of service promises, billing, and product details (Zeithaml, Parasuraman & Malhotra, 2002). Studies indicate that customer satisfaction increases when services are perceived as dependable and reliable (Lukman, 2024; Woldemichael, 2024; Almurshidee, 2018). Almurshidee (2018) emphasizes that the dependability of e-banking services is a crucial determinant of consumer satisfaction in the Saudi banking sector. Anjum and Saha (2020) assert that a customer's total opinion of e-service quality is closely related to their enjoyment, emphasizing the significance of reliability.

Website design includes the aesthetics, content, and structure of an online catalog (Cai & Jun 2003). A well-structured and visually appealing website serves as the first point of contact for online clients, changing their opinion of the company and promoting interaction with its digital offerings (Ighomereho, Ojo, Omoyele, & Olabode, 2022). According to Sohn and Tadisina (2008), a website's design is similar to that of a traditional store, influencing users' views of the online service provider and consequent behavioral intentions.

Responsiveness is crucial in influencing consumer satisfaction across multiple service sectors, including e-retailing (Ahmed et al., 2022; Tabash, Albugami, Salim & Akhtar, 2019). This aligns with the findings of Kim and Jackson (2009), which indicated that responsiveness significantly influences e-satisfaction among online consumers. Consequently, online shopping providers must focus on offering substantial guarantees, addressing customer concerns and issues, and providing quick return choices. A provider's promptness in responding to inquiries correlates positively with the evaluation of service quality (Van Riel et al, 2003). These findings are

consistent with Khatoon, Zhou, and Hussain (2020) research, which emphasizes that responsiveness in electronic banking services is essential to maintaining high levels of customer satisfaction.

Perceived usability is comprised of convenience of ordering, ease of understanding, ease of use, and ease of purchase, as determined by Tandon et al. (2016). Kim and Stoel (2004) discovered that a comprehension of the website is the catalyst for online purchases. According to Mustakim et al. (2022), perceived usability and perceived utility have a substantial impact on customer satisfaction on e-commerce platforms, which further corroborates the notion that usability is a critical determinant of customer satisfaction. This claim is supported by Chong (2023), who claims that perceived utility is crucial in shaping consumer behavior, thereby connecting usability to overall satisfaction. For instance, Nourallah (2021) has discovered that customer loyalty is indirectly influenced by usability by its effect on customer satisfaction, underscoring the significance of usability in mobile banking applications. This implies that improving usability can result in increased consumer satisfaction, which in turn encourages loyalty.

Security and privacy are essential components of online shopping platforms, as they significantly affect perceptions of overall quality and, consequently, user satisfaction. The information provided on the website serves as a significant indicator of user satisfaction (Sabiote, Frias, & Castaneda, 2012). Lee and Lin (2005), Parasuraman et al. (2005), and Van Riel et al. (2003) identified privacy and security as critical components of e-SERVQUAL. Reichheld and Schefter (2000) assert that online customers rely on their trust in the shopping platform, as they lack direct interaction with employees and physical store facilities. Febriarizka (2023) highlights that website security and privacy significantly influence customer satisfaction in e-commerce. When customers perceive high levels of security and privacy, their satisfaction with the service increases correspondingly (Febriarizka, 2023). Security is a crucial factor in the adoption of digital wallet services, indicating that customers expect robust security mechanisms to protect their transactions and personal information (Muhtasim et al., 2022).

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Customer Satisfaction

Research demonstrates that customer satisfaction is determined not just by product quality but also by service quality, customer experience, and the overall value perceived by customers (Williams & Naumann, 2011; Drosos et al., 2019). Customer happiness is essential for establishing enduring relationships and enhancing profitability, particularly for online retailers. Deng et al. (2009) assert that a company's capacity to generate elevated customer satisfaction is pivotal in differentiating products and forging robust connections with consumers. In the realm of e-commerce, "e-satisfaction" denotes the favorable emotions clients experience when their expectations or objectives are fulfilled during an online shopping encounter. This is especially crucial in the B2C (business-to-consumer) sector, as client happiness can determine a company's success (Anderson and Srinivasan, 2003). Zhang and Von Dran (2000) define e-satisfaction as an emotional response that influences customer perceptions of products and services, hence molding their loyalty.

A shopper's overall satisfaction with an online retailer is closely tied to how well the website performs and the quality of the products it offers (Eid, 2011). Enjoyment also plays a big part, as Cai and Xu (2006) noted, with satisfied customers often reporting that they had fun while shopping online. Additionally, Yao and Liao (2011) found that a good decision-making process, smooth shopping experience, and overall satisfaction with online services are all critical to driving e-satisfaction.

Customer satisfaction is often considered a reflection of the quality of service, but it can be hard to define because it covers so many aspects (Sattar & Sattar, 2012). One major factor that boosts customer satisfaction in online shopping is the quality of electronic services (eSERVQUAL). High-quality e-services strengthen the relationship between online sellers and shoppers, benefiting both sides by improving customer loyalty and

seller performance. Measuring and improving e-service quality which focusing on aspects like website design, reliability, responsiveness, security, and privacy which can lead to higher e-satisfaction among shoppers (Zha, Ju, & Wang, 2006).

Relationship between eSERVQUAL and Customer Satisfaction

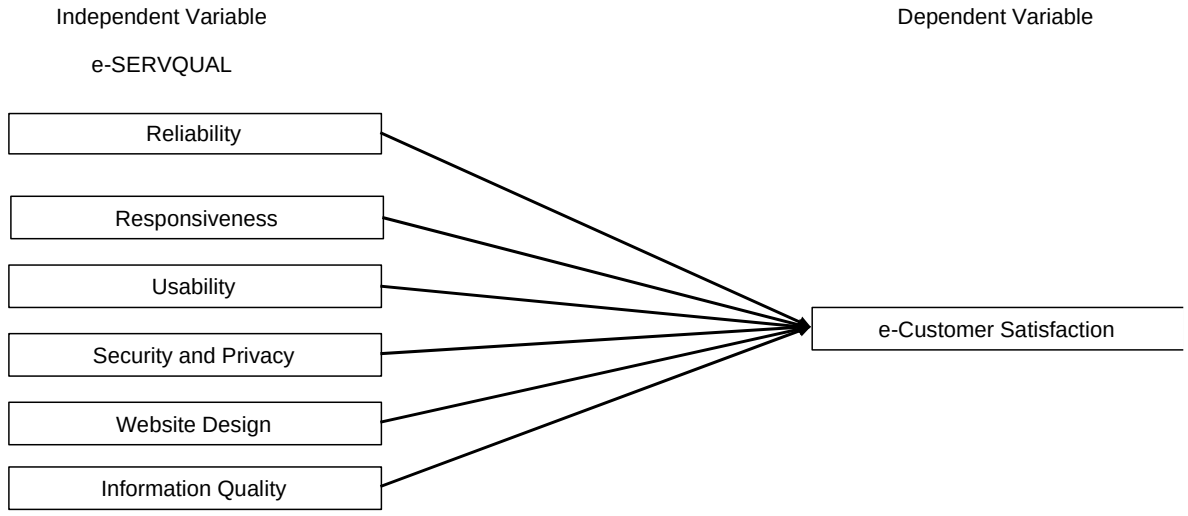
The correlation between eSERVQUAL and customer satisfaction is a critical study area within online services. eSERVQUAL, a modification of the conventional SERVQUAL model, primarily pertains to the quality of electronic services, which is more relevant in the contemporary digital marketplace. Numerous studies have demonstrated a substantial positive association between e-service quality and customer satisfaction, suggesting that enhanced perceived e-service quality results in elevated customer satisfaction.

Anjum and Saha (2020) state that customer satisfaction is closely associated with service quality, mentioning that e-service quality reflects customers' overall evaluation of e-service delivery in the banking sector of Bangladesh. This finding aligns with the study by Almurshidee (2018), which identifies the quality of e-banking services as a fundamental pillar for ensuring customer satisfaction and retention in Saudi commercial banks.

Rita, Oliviera, and Farisa (2019) state that e-service quality is a crucial factor in determining consumer satisfaction in online buying contexts, underscoring the significance of this relationship in shaping customer behavior. Research by Utami (2024) indicates that e-service quality promotes customer satisfaction and is essential for improving client loyalty, thereby demonstrating a direct correlation between the quality of electronic services and total customer satisfaction. Additionally, research on electronic banking service quality indicates substantial effects on customer happiness, underscoring the need for excellent service delivery in digital environments to attain elevated satisfaction levels (Khatoon et al., 2020). This study underscores the importance of eSERVQUAL aspects in shaping customer experiences and satisfaction.

The conceptual structure for this study, derived from the literature review, is presented below, comprising e-SERVQUAL as the independent variable and e-customer satisfaction as the dependent variable.

Figure 1: Conceptual Framework



3. Research Methodology

Non-experimental research was carried out using the correlational research approach to investigate the relationship between e-SERVQUAL and customer satisfaction in online shopping platforms. This study was carried out to investigate the relationship between the two. A total of one hundred people were included in this study's population. The population of this study was derived by calculating the average number of persons who shop online every month in the Bandar Utama City Centre. A method known as purposive sampling was utilized in the course of this research project. The screening questions were asked to the respondents before the

questionnaire was distributed to them. The purpose of these questions was to determine whether or not the respondents had recently utilized any of the e-commerce platforms. It is planned to construct a collection of questionnaires, which will then be given to the respondents. The use of a questionnaire makes it simple to collect information from the individuals who are participating in the study. To facilitate the participant's interpretation of the questions and to provide useful responses for the research, the questionnaire was meticulously constructed to include characteristics that are relevant to the interests of online consumers. All of the responses to the questionnaire were checked to ensure that they were comprehensive before being included in the data analysis system. Statistical Packages for Social Science (SPSS) was utilized to perform the analysis of the data that was acquired. To conduct the analysis, descriptive statistics were utilized. These data included frequency, percentage, and the Pearson Product Moment Correlation Coefficient.

4. Results

Demographic Background

This study includes participants of both genders, male and female, employed at Bandar Utama City Centre, aged between 18 and over 56 years, with a significant number of respondents falling within the 26 to 35 years age bracket. A significant portion of the respondents, comprising 76.0%, identified as Malay, while 64.0% of the participants reported being single. The findings indicate that a significant portion of respondents engage in purchasing activities every month, with 34.0% of the total respondents reflecting this behavior. 58.0% of participants selected Shopee as their favored online platform. 36.0% of respondents selected electronic items as their preferred choice on online shopping platforms.

Relationship between e-SERVQUAL and Customer Satisfaction

The results of the correlation between e-SERVQUAL and e-customer satisfaction in online shopping among shoppers at Bandar Utama City Centre are presented in Table 1. All correlations were analyzed and documented. Table 1 demonstrates a notable correlation between the dimensions of e-SERVQUAL and e-customer satisfaction in the context of online shopping among employees at Bandar Utama City Centre.

The relationship between privacy and e-customer satisfaction exhibits a notable strength, indicated by a correlation coefficient of ($r = 0.673^{**}$, $p > 0.05$). This indicates that addressing privacy concerns is likely to lead to an increase in customer satisfaction. Furthermore, a significant correlation exists between responsiveness and e-customer satisfaction, evidenced by a correlation coefficient of ($r = 0.713^{**}$, $p > 0.05$). The relationship between website design and e-customer satisfaction is significant, evidenced by a correlation value of ($r = 0.739^{**}$, $p > 0.05$), underscoring the influence of an effective website layout on customer satisfaction. Fourth, usability shows a significant correlation with e-customer satisfaction ($r = 0.731^{**}$, $p > 0.05$), highlighting the critical role of user-friendly interfaces in improving the customer experience. The relationship between reliability and e-customer satisfaction exhibits a strong correlation, quantified at ($r = 0.652^{**}$, $p > 0.05$). The relationship between information quality and e-customer satisfaction is moderate, indicated by a correlation of ($r = 0.548^{**}$, $p > 0.05$). The strength of this relationship, while still significant, is somewhat lower than that of the other dimensions, suggesting that information quality exerts a moderate influence on e-customer satisfaction. The results indicate that several critical components of e-SERVQUAL, such as privacy, responsiveness, website design, usability, and reliability, have a significant effect on e-customer satisfaction, whereas information quality exerts a moderate influence.

Table 1: Correlation Results

Correlation Variable	r	Sig. (2-tailed)
Privacy	0.673**	0.00
Responsive	0.713**	0.00
Website Design	0.739**	0.00
Usability	0.731**	0.00
Reliability	0.652**	0.00
Information Quality	0.548**	0.00

Discussion

All dimension in e-SERVQUAL was found out to have a significant relationship with e-customer satisfaction. First, in the aspect of privacy, Al-Hawary and Al-Smeran (2017) indicate that privacy has a significant effect on customer satisfaction within Islamic banks in Jordan, suggesting that customers feel more satisfied when they trust that their personal information is safeguarded during transactions. Vun et. al. (2013) emphasize that consumers express higher satisfaction levels when their confidential information is preserved, reinforcing the idea that privacy is a crucial determinant of customer satisfaction. Furthermore, the findings of Ojochide (2023) reveal that privacy, along with other service quality dimensions, plays a vital role in fostering customer loyalty in the e-commerce market.

The research by Gautam and Sah (2023) demonstrates that responsiveness is a vital element in online banking service practices, with effective customer service associated with increased customer satisfaction levels. Responsiveness and empathy are critical factors influencing customer satisfaction in Islamic banks, indicating that timely attention to customer needs enhances satisfaction levels (Fida et al., 2020). Research in various sectors, including retail and hospitality, confirms the idea that responsive service improves customer satisfaction. Narteh (2018) emphasizes that responsiveness is a vital element of customer satisfaction in retail banking, underscoring its significance in various service contexts. Pakurár et al. (2019) demonstrated that responsiveness correlates with customer satisfaction in the Jordanian banking sector, underscoring the necessity of prompt and effective service responses for sustaining customer satisfaction.

Numerous research studies have shown a significant positive correlation between the quality of website design and customer satisfaction. Atamja (2023) identified that website design significantly influences e-satisfaction among users of e-commerce platforms in Korea. This is consistent with the research of Daniati and Roostika (2021), which highlighted that high-quality website design has a direct impact on e-satisfaction and e-loyalty in e-commerce customers.

Previous studies have also reported a strong positive correlation between perceived usability and e-customer satisfaction. Tandon et al. (2016) demonstrated that perceived usability, website functionality, and perceived usefulness significantly enhance customer satisfaction in online shopping environments. The findings of Belanche Casaló and Guinalíu (2012) indicate that website usability has a significant impact on consumer satisfaction and the intention to use a website, implying that increased usability correlates with enhanced satisfaction.

Woldemichael (2024) demonstrated that the reliability dimension of service quality has a significant effect on customer satisfaction within the Ethiopian Electric Utility, suggesting that customer satisfaction increases with the perception of reliable services. This finding aligns with the research by Janahi and Mubarak (2017), which underscores a significant correlation between reliability and customer satisfaction in Islamic banking, indicating that reliable services contribute to elevated levels of customer satisfaction.

This finding is by Maghfur et al.(2021), stated that information quality plays a vital role in customer satisfaction, as it allows customers to feel comfortable and confident when making purchases in online marketplaces Furthermore, Liu et al. (2008) conducted an empirical study that supports the notion that information quality significantly influences customer satisfaction in online shopping contexts. This aligns with the findings of Nguyen and Khuc (2022) who also emphasize the importance of information quality in enhancing customer satisfaction in mobile banking services.

5. Recommendations and Conclusion

Based on the findings of this study, there are several areas for improvement that online shopping platforms particularly popular ones like Lazada and Shopee should address. While most users are generally satisfied with the current website designs, there is room for further innovation, particularly in terms of technology. Implementing cutting-edge technologies can not only enhance the customer experience but also attract new users and boost sales.

In terms of information quality, improvements are particularly needed in the area of contact details. Some users have reported difficulties in reaching the platform or obtaining solutions quickly due to the lack of readily

available contact numbers. Enhancing the availability of customer support information would improve user satisfaction.

While numerous studies have explored e-SERVQUAL and its impact on customer satisfaction, future research should consider integrating additional variables to gain deeper insights into the factors that influence e-customer satisfaction. This is particularly important as online shopping continues to evolve and become a central part of consumer behavior in today's digital age.

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Foreign Workers and Remittance Outflow in Malaysia

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Abstract: This conceptual paper reviews foreign workers and remittance outflows in Malaysia. Foreign workers in Malaysia, who remit a portion of their earnings back home, play a crucial role in the country's economic development. With approximately 1.5 million foreign workers engaged in various sectors such as manufacturing, plantation, construction, and agriculture, Malaysia relies heavily on foreign labor. Predominantly, these workers come from Indonesia, Nepal, and Bangladesh. Factors such as Malaysia's economic performance, government recruitment policies addressing labor shortages, and cultural and geographical proximity influence why these workers choose Malaysia. Despite concerns that foreign workers might negatively impact short-term labor market outcomes by taking jobs from locals and suppressing wages, the evidence suggests their presence does not significantly harm these outcomes. However, the growing number of foreign workers has led to a notable increase in remittance outflows. Remittance outflows represent a transfer of capital from host countries to the workers' countries of origin. Among the ASEAN-5 countries, Malaysia has recorded the highest remittance outflows, surpassing inflows. While research on remittance flows has expanded, the focus has traditionally been on inflows, with outflows receiving less attention due to their relatively small impact on the macroeconomic indicators of sending countries. Existing literature indicates that remittance outflows can influence the economic growth and inflation of sending countries, including Malaysia, despite varied findings.

Keywords: *Foreign Workers, Remittance Outflow, Economic Growth, Inflation*

1. Introduction and Background

Globalization and market integration have characterized the global economy over the past two decades. A significant aspect of this globalization is the integration of labor markets. It is estimated that approximately 272 million people live and work outside their countries of origin (UNDESA, 2019). Malaysia serves as both a destination for immigrants and a source of labor migrants (Young and Konishi, 2006). From 2018 to 2020, Malaysia hosted between 1.4 million and 2 million documented migrants, with unofficial estimates ranging from 1.2 million to 3.5 million additional migrants (International Organization for Migration (IOM), 2019) positioning Malaysia as one of the largest migrant-receiving countries in Southeast Asia. The country also ranks high in terms of the migrant-to-population ratio within the Asia-Pacific region. However, a significant portion of the migrant population in Malaysia has relatively low educational qualifications, with only 52 percent holding tertiary education.

Despite Malaysia's relatively high population growth, the rapid expansion of its economy, increasing urbanization, high educational attainment among its citizens, and the relatively low labor force participation of women have led to a substantial demand for migrant workers to fill low-wage positions. There is significant discourse about the reluctance of local workers to undertake 'dirty, dangerous, and difficult' (3D) jobs. According to official data from the Immigration Department and Ministry of Home Affairs, as of September 2019, Malaysia employed approximately 1.98 million regular migrant workers. About one-third of these workers are employed in the services sector, with 25 percent working in agriculture (World Bank Group, 2020). Migrant workers in Malaysia primarily come from Indonesia, Bangladesh, Nepal, Myanmar, and, to a lesser extent, India, Cambodia, and Lao PDR. They are engaged across various sectors, including manufacturing, plantation, agriculture, services (such as hospitality and security), and domestic work. These labor migrants are vital to the economies of both Malaysia and their home countries, constituting around 20 percent of the Malaysian workforce (International Labor Organization, ILO, 2022) and predominantly filling low-skilled and semi-skilled positions (International Organization for Migration, IOM).

According to Bernama (2023), the anticipated arrival of 500,000 foreign workers in Malaysia this year is not expected to impact job opportunities for Malaysian citizens. These workers will be recruited from 15 Asian

countries and assigned to sectors that generally attract few local workers, such as plantation, agriculture, and construction. Despite the high dependence on foreign labor in these industries, local workers have shown little interest in these roles. Without an adequate influx of foreign workers, the effective functioning of these sectors could be jeopardized, leading to significant operational disruptions and financial losses.

The urgent need to address the worker shortage is critical, as the COVID-19 pandemic led to the return of over 700,000 foreign workers to their home countries. To mitigate this issue, the Human Resources Ministry and the Home Affairs Ministry have streamlined and expedited the foreign worker hiring process, which now takes only three days. Many businesses face potential closures due to insufficient labor. Despite the lifting of restrictions on foreign workers, Malaysia has not seen a significant influx of migrant workers. This is largely due to delays in government approvals and prolonged negotiations over the Memoranda of Understanding (MOUs) with Indonesia and Bangladesh regarding the recruitment and protection of migrant workers. In April 2022, out of 475,000 requested migrant workers, only 2,065 applications were approved (International Labor Organization (ILO), 2022).

The growing number of foreign workers has led to a substantial rise in remittance outflows. Since 1983, the United States has been the top global remittance sender annually, with Russia, Saudi Arabia, and Switzerland following as major contributors since 2007. On a broader scale, the outflow of workers' remittances can negatively impact a country's economic growth by reducing consumption and investment activities within the host country. Remittance outflows represent a leakage from the circular flow of income, diminishing the funds available for economic activity. Excessive leakage can hinder economic growth, as the substantial sums transferred by foreign workers to their home countries are not utilized for consumption or investment in the host country. Consequently, these outflows act as withdrawals from the circular flow of money, reducing overall economic activity and negatively affecting aggregate demand (Termos et. al, 2013 and Alkhathlan, 2013). Many low-skilled foreign workers in Gulf Cooperation Council (GCC) countries live away from their families, which contributes to their tendency to send a significant portion of their earnings back home (Naufal & Genc, 2017).

A local economic think tank has warned that Malaysia's current account balance could slip into deficit in the latter part of 2017 if export performance does not improve and if the outflow of ringgit due to foreign workers' remittances continues to rise. In the second quarter of 2016, Malaysia's net current account balance fell to RM1.9 billion, a decrease from RM5 billion in the first quarter. Despite steady growth in exports when measured in ringgit, they have been declining in US dollar terms for over 20 months. Rising remittance outflows are intensifying concerns about a potential current account deficit as early as 2017, particularly if global trade remains sluggish. These remittance outflows are viewed as a form of economic leakage, reducing the amount of capital available for domestic consumption and investment, which in turn diminishes local demand.

Nevertheless, there are alternative views on remittance outflows that may challenge prevailing assumptions. While some view remittances as a financial drain on Malaysia, they can offer economic benefits. For example, the government can impose a six percent Goods and Services Tax (GST) and corporate tax on these remittances. Moreover, as the remittance sector grows, it can create positive spillover effects, supporting various service industries and providing additional revenue to the Malaysian economy (Rosli, 2018).

This paper aims to review recent empirical research on the impact of foreign workers and remittance outflows in Malaysia. Section 2.0 outlines the trends in foreign workers in Malaysia and their effects on the local economy. Section 3.0 explores the impact of remittance outflows on Malaysia's economy and their influence on other countries' economies. The final Section 4.0 provides concluding remarks. While much of the existing research on remittance outflows has concentrated on Gulf Cooperation Council (GCC) countries, especially regarding their effects on economic growth and inflation, there is a notable lack of studies focusing specifically on Malaysia and other significant remittance-sending nations such as the USA, Russia, Germany, and Switzerland.

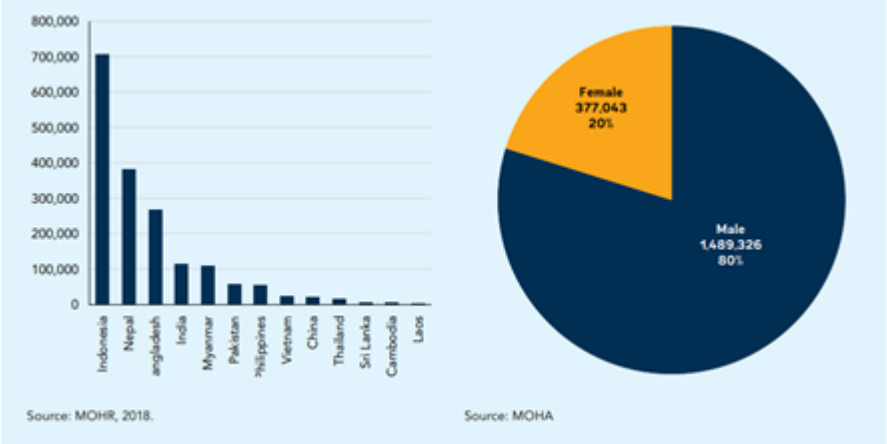
2. Foreign Workers

The Trend Theories and The Determinants of Foreign Workers in Malaysia

The rise in migrant workers has been significantly influenced by demographic changes, internal conflicts, climate change, and income inequality (Edrees, 2015). Numerous theoretical models have been proposed to explain international migration, though many have been developed independently of one another. These theories include the Neoclassical Theory of Migration, Human Capital Theory, New Economics of Labor Migration Theory, Dual Labor Market Theory, Trade Theory, and Gravity Model Approaches. Additionally, various models such as the Ricardian model, the Specific Factors model, the Heckscher-Ohlin model, and the Push and Pull Factors model also offer explanations for the migration process (Jajri and Ismail, 2014).

Figure 1 illustrates the distribution of migrants in Malaysia for the year 2018. The largest group of migrants originates from Indonesia, totaling 700,000 individuals. Following Indonesia are migrants from Nepal, Bangladesh, India, Myanmar, Pakistan, and the Philippines. The data also indicates that the number of male workers exceeds that of female workers.

Figure 1: Migrant Workers in Malaysia by 2018



The migration of unskilled and short-term labor from Bangladesh to Malaysia has been a persistent trend with significant economic implications for both countries: it provides vital remittances to Bangladesh and helps meet Malaysia's demand for '3D' (dirty, dangerous, and difficult) labor (Mannan and Farhana, 2015). For Nepali migrant workers, Qatar has been the top destination, receiving 32% of them, followed by Malaysia at 24%, and the UAE and Saudi Arabia, each attracting 17% from 2015 to 2019. Male migrants primarily head to the UAE, Qatar, Malaysia, Jordan, Cyprus, Saudi Arabia, Kuwait, and Turkey. In contrast, female migrants, who mostly work as domestic helpers, tend to migrate to the UAE, Qatar, Malaysia, Kuwait, Jordan, and Cyprus, which together account for approximately 75% of female migrant workers (IOM, 2019). Indonesian migrants are driven abroad by high domestic unemployment, with Malaysia being a significant destination. Additionally, increased remittances to Indonesia often encourage Indonesians to either seek or maintain employment abroad (Abd. Rahim, et. al., 2017).

Malaysia is a significant destination for economic migrants from Myanmar, including those from Chin State. For these migrants, remittances are vital for supporting their families' livelihoods. Research indicates that the main reasons for migration among residents of Chin State are poverty, decreased agricultural productivity due to climate change, and limited local job opportunities. Additionally, migrants from Chin State experience systemic discrimination in Myanmar, including ethnic and religious biases, military oppression, and human rights abuses. The higher wages available in Malaysia enable these migrants to repay debts and fulfill their families' essential needs and welfare (Khai and Sawn, 2023).

Malaysia attracts foreign workers due to its robust economic performance and government policies aimed at addressing labor shortages. Cultural and geographical proximity also play important roles in this trend. The

country's rapid economic growth, coupled with high labor demand, lower costs, and industrialization, has made Malaysia an appealing destination for foreign workers (Noor et. al., 2011). The ongoing economic expansion and the continued need for unskilled labor are expected to keep drawing migrants from neighboring countries. Significant economic and educational disparities between Malaysia and its more populous neighbors, such as Indonesia and the Philippines, are key drivers behind these migration patterns. The demand for foreign unskilled labor in Malaysia is driven by several important factors. Firstly, there has been a notable advancement in the education and skill levels of the Malaysian workforce. Secondly, certain sectors continue to be critical and labor-intensive, including agriculture, low-skill and low-technology manufacturing (such as wood products), and domestic services like construction (Carpio et al, 2015).

Jajri and Ismail (2014) identify the real wage ratio between Malaysia and the ASEAN-3 countries (Indonesia, Thailand, and the Philippines) as a key factor influencing migration patterns. They found that a higher wage ratio negatively impacts migration, with a stronger effect observed in Indonesia and the Philippines compared to Thailand. The exchange rate is also crucial, as a stronger exchange rate tends to reduce migration. Additionally, high unemployment rates in the migrants' home countries act as a push factor, encouraging people to seek opportunities in Malaysia. The real wage ratio is closely linked to the GDP levels of the countries involved. If Malaysia's GDP grows faster than that of its ASEAN-3 neighbors, the resulting decrease in the wage ratio is likely to lead to increased migration.

The Advantages and Disadvantages of Foreign Workers in Malaysia

Migrant workers play a crucial role in driving economic growth in host countries by broadening the workforce, stimulating new business ventures, and supporting various developmental activities. They enhance economic efficiency by filling both low- and high-skill labor markets. The influx of foreign workers contributes to greater human capital accumulation, which in turn facilitates technology transfer in the host countries (Edrees, 2015). Foreign labor has a significant positive impact on labor productivity and does not merely serve as a direct substitute or complement to domestic labor (Noor et. al. 2011). At the enterprise level, the presence of foreign workers has been vital for the expansion of many sectors, especially within export-oriented manufacturing industries (Carpio et al., 2015).

The influx of foreign labor in Malaysia has generated considerable debate about its effects on Malaysian workers and businesses. One major concern is that foreign workers might displace local workers or drive down their wages. Additionally, the abundance of inexpensive labor may reduce firms' motivation to invest in advanced technologies and improve their operations. The rise in undocumented foreign workers—those who have either entered Malaysia without proper permits or overstayed their visas—presents further challenges. A large number of undocumented workers can complicate the enforcement of minimum wage laws and the management of sector-specific visa quotas and levies (Carpio et al., 2015). Moreover, Malaysia's heavy dependence on foreign labor may hinder local companies from advancing up the value chain and enhancing the country's economic competitiveness. There are also significant socioeconomic impacts, as the influx of low-paid, unskilled foreign workers can suppress wages for Malaysian workers at the lower end of the labor market (The Straits Times, 2016).

In contrast, existing empirical research on the impact of foreign workers tends to be positive, with limited evidence supporting significant negative economic effects. Numerous studies have highlighted a discrepancy between public perceptions and the findings of economic research regarding foreign workers. These workers typically occupy unskilled positions, which minimizes direct competition with Malaysians, who generally hold semi-skilled and skilled roles. As a result, foreign workers do not significantly affect employment opportunities or wages for local workers. However, the long-term implications of foreign labor remain uncertain. The availability of a large pool of unskilled labor could potentially pose risks to Malaysia's economic structural transformation. Industries that rely heavily on foreign workers often show lower levels of investment in technology. Persistent dependence on low-cost foreign labor might deter investment in innovation and high-skill jobs, potentially hindering Malaysia's progress toward becoming a high-income nation (Allen and Tan, 2019).

The Challenges of Foreign Workers in Malaysia

One major challenge for foreign workers in Malaysia is the depreciation of the ringgit. According to Malaysia's

leading private-sector employers' association, foreign workers are demanding higher wages to offset the reduced value of the ringgit. Sectors such as services, construction, and plantations are particularly affected. Due to the unfavorable exchange rate, some foreign workers are sending less money back home (Shamsundari, 2016). Consequently, many workers are considering returning to their home countries rather than continuing to earn in a devalued currency. While large companies are exploring wage adjustments and subsidies to support remittances, workers employed by smaller firms are less inclined to renew their permits due to the high associated costs (The Straits Times, 2016).

Some foreign maids are using the devaluation of the Malaysian ringgit as leverage to demand wage increases of up to 40 percent. Industry insiders observe that workers from Indonesia and Vietnam are primarily employed in manufacturing, while those from Thailand are concentrated in the services sector. Workers from Nepal, Bangladesh, and Cambodia mainly work in construction. The foreign maid sector is predominantly staffed by Indonesian workers. However, those most inclined to leave due to the ringgit's decline are from Thailand, Indonesia, and Vietnam. As a result of the currency's depreciation, Malaysia has fallen out of the top three preferred destinations for these workers. Indonesian workers, in particular, are now seeking employment opportunities in Singapore, Hong Kong, Taiwan, or the Middle East instead (Kong, 2015).

3. Remittance Outflow

The Theory of Remittances

The Neoclassical Theory posits that individuals migrate to other countries in pursuit of higher-paying job opportunities, sending remittances back home to support their families and enhance their standard of living. This migration is considered a rational economic choice aimed at maximizing income (Gheasi and Nijkamp, 2017). In contrast, the New Economics of Labor Migration (NELM) theory highlights that migration decisions are often made collectively by households rather than individuals alone. Remittances are seen as a strategy to diversify income sources and mitigate risks in the home country. These funds can be invested in areas such as education, healthcare, and other productive activities (Taylor, 1999).

Transnationalism theory emphasizes that migrants continue to maintain robust social, cultural, and economic connections with their home countries even after relocating abroad. Remittances are viewed as a means to sustain these transnational ties and foster development in both the sending and receiving countries (Martiniello, 2021). On the other hand, dependency theory suggests that remittances can reinforce dependency relationships between sending and receiving countries. Although remittances provide essential income, they may also hinder the development of domestic industries and obstruct the structural changes necessary for economic growth (Abby, 2020).

Certain theories highlight that remittances can act as a source of investment capital for development projects in the home country. Migrants may use these funds to invest in businesses, infrastructure, or financial assets that support economic growth (Chami et. al., 2003). Network theory underscores the importance of social networks in facilitating both migration and remittance flows. Migrants often depend on personal connections within their communities abroad to secure employment and send money back home (Sha, 2021).

The Trend and Determinants of Remittance Outflow in Malaysia

According to Neoclassical Theory, an increase in remittances constitutes non-labor income. When non-labor income rises, laborers tend to prefer leisure, which is considered a normal good, leading to a reduction in labor supply and agricultural output. However, if increased remittances are invested in capital goods and advanced technology, they can boost production levels (De Brauw, 2010).

Due to the growing number of foreign workers, Malaysia experienced higher remittance outflows compared to inflows. From January to September 2014, foreign workers remitted approximately RM23.07 billion out of Malaysia through around 113 million transactions (Malaysia Kini, 2015). Among the recipients, Nepal received the largest number of remittances, totaling Rs132.75 billion, making Malaysia the most favored destination for Nepali migrant workers. According to the Nepal Rastra Bank (NRB), Nepali migrant workers sent home Rs132.75 billion in the first 11 months of the last fiscal year, which accounts for 22 percent of the total remittances received by Nepal.

Table 1: Comparing Malaysian Remittance Outflow with the Other Top Remittance Sending Countries

	Outward remittance flows (US$ million)							
Years	United States	Saudi Arabia	Switzerland	Germany	China	Russian Federation	France	Malaysia
2010	50,527	27,069	18,512	14,682	1,455	21,454	12,026	8,628
2011	50,854	28,475	23,680	16,126	1,618	26,010	12,858	9,422
2012	52,371	29,493	23,740	15,581	1,788	31,648	12,561	8,958
2013	55,003	34,984	25,338	19,977	1,714	37,217	13,425	8,982
2014	57,239	36,924	26,817	20,084	4,155	32,640	13,730	10,192
2015	60,719	38,787	26,031	18,249	5,718	19,689	12,792	10,483
2016	62,870	37,843	26,049	19,348	6,211	16,244	13,284	10,105
2017	64,058	36,119	26,935	21,699	16,253	20,610	13,799	9,394
2018	67,009	33,882	27,675	24,351	16,548	22,308	15,075	10,916
2019	71,562	31,197	28,180	23,936	15,135	22,217	15,088	11,377
2020	68,000	34,596	27,965	22,024	18,121	16,895	15,038	9,066

Source: GDP data from IMF World Economic Outlook, Outward Remittance Flow from Knomad. Date: May 2021

Table 1 provides a comparison of Malaysia's remittance outflows with those of other leading remittance-sending countries in 2021. The United States leads in remittance outflows, followed by Saudi Arabia, Switzerland, Germany, China, the Russian Federation, and France. In 2020, Malaysia's remittance outflow was 9,066 million USD. Over the past decade, Malaysia has experienced a general increase in remittance outflows, rising from 8,628 million USD in 2010 to 11,377 million USD in 2019.

Table 2: Comparing Malaysia with Other Countries; Remittances as a share of GDP in 2020 (%)

Countries	Remittances as a share of GDP in 2020 (%)
Timor-Leste	22.2%
Luxembourg	19.4%
United Arab Emirates	12.2%
Qatar	7.4%
Tonga	5.7%
Seychelles	4.0%
Solomon Island	4.2%
Saudi Arabia	4.9%
Switzerland	3.7%
Malaysia	2.7%

Source: GDP data from IMF World Economic Outlook, Outward Remittance Flow from Knomad. Date: May 2021

Table 2 shows the remittances as a share of GDP in 2020 in percent. The highest share is Timor-Leste, followed by Luxembourg, United Arab Emirates, Qatar, Tongo, and other countries. Remittance outflow sums are large but in relative terms, the picture can be different. Typically outflows go from wealthier economies to developing countries. So, the GDP of the sending economies is usually large (Naufal and Genc, 2017).

Table 3: Remittance Outflows and Remittance Inflows in the ASEAN-5 Countries

Years	Outward remittance flows (US$ million)				Years	Migrant remittance inflows (US$ million)			
	Malaysia	Indonesia	Thailand	Philippines		Malaysia	Indonesia	Thailand	Philippines
2010	8,628	2,840	3,027	109	2010	1,103	6,916	4,433	21,557
2011	9,422	3,164	2,921	135	2011	1,211	6,924	5,256	23,054
2012	8,958	3,634	2,893	152	2012	1,294	7,212	5,657	24,610
2013	8,982	3,951	3,289	210	2013	1,423	7,614	6,585	26,717
2014	10,192	4,119	3,620	183	2014	1,580	8,551	6,524	28,691
2015	10,483	4,605	3,992	153	2015	1,644	9,659	5,895	29,799
2016	10,105	5,151	4,155	196	2016	1,604	8,907	6,270	31,142
2017	9,394	5,177	4,397	246	2017	1,649	8,990	6,720	32,810
2018	10,916	5,148	4,924	259	2018	1,686	11,215	7,466	33,809
2019	11,377	5,071	8,913	226	2019	1,638	11,666	8,162	35,167
2020	9,066	4,547	7,898	211	2020e	1,454	9,651	8,067	34,913

Table 3: Remittance Outflows and Remittance Inflows as Share of GDP in 2020 (%)

Outward remittance flows (US$ million)				Migrant remittance inflows (US$ million)			
Malaysia	**Indonesia**	**Thailand**	**Philippines**	**Malaysia**	**Indonesia**	**Thailand**	**Philippines**
2.7	0.4	1.6	0.1	0.4	0.9	1.6	9.6

Source: Knoema

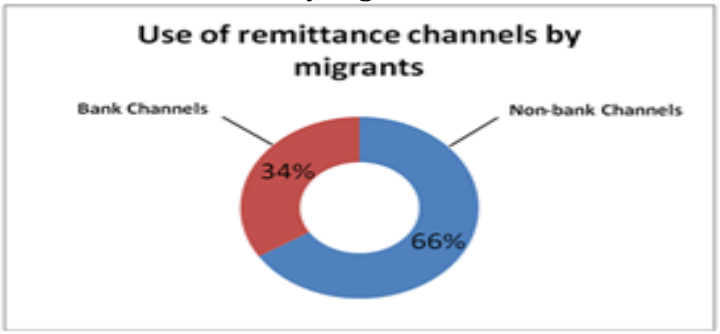
Table 3 shows the inward and outward remittance flows in ASEAN-5 countries excluding Singapore. It shows that in 2019 the remittance outflow and its share of GDP from Malaysia are the highest, followed by Thailand, Indonesia, and the Philippines. As for the remittance inflow, the Philippines recorded the highest followed by Indonesia, Thailand, and Malaysia.

Foreign workers in Malaysia frequently send a significant portion of their earnings back to their home countries. According to Mustapa and Pasquire (2007), immigrant construction workers typically spend less than their Malaysian counterparts and remit the majority of their income abroad. This high level of remittances can be attributed to the nature of their work and their transient lifestyle. Sayed Mahadi et. al. (2017) found that Indonesian migrant workers in Sabah who had families were less inclined to send money back to their families in Indonesia, as they needed to address family needs in Malaysia. This indicates that migrants with families tend to spend more locally and support the Malaysian economy rather than remit funds to their home countries.

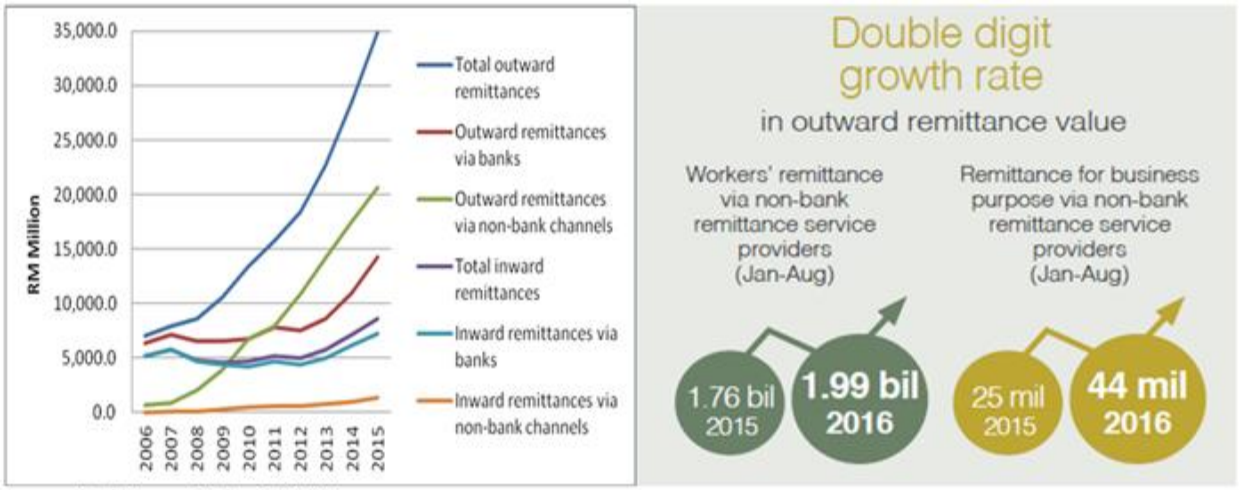
Remittance Channels to Remit Money from Malaysia to the Host Countries

Figure 2 illustrates the methods used by migrants to send remittances to their home countries. According to the data, 34% of migrants utilize bank channels for their remittances, whereas 66% use non-bank channels.

Figure 2: Use of Remittance Channels by migrants



Source: apmigration.ilo.org (2017)



Source: Bank Negara Malaysia (2016)

Figure 2 illustrates the preferred methods used by foreign workers in Malaysia for remitting money. In 2016, 1.99 billion USD was sent through non-bank remittance services, with an additional 44 million USD remitted for business purposes via these providers. Malaysia is among the few countries that have met the United Nations' Sustainable Development Goals (SDG) target of reducing the cost of cross-border remittances through non-bank services to 3% by 2030. This achievement is largely attributed to increased competition within the remittance sector and the rise of digital transfer methods, which enhance transparency and facilitate cost comparisons among service providers. By the end of 2017, Malaysia had 344 licensed money services companies operating a total of 2,979 branches. Of these, 34 are direct remittance service providers, and 17 offer digital remittance options (Rosli, 2018).

The adoption of e-remittance services provided by remittance companies saw substantial growth in 2020. The total value of e-remittance transactions surged to RM6.6 billion, more than double the RM3.2 billion recorded in 2019, and represented 25% of total outward remittances, up from 14% the previous year. This increase was driven by the reduced costs associated with e-remittance services and the ease of the electronic onboarding process (e-KYC), which enhanced the user experience. The expansion of e-remittance capabilities also played a key role in the industry's rapid recovery from the pandemic, with total outward remittances reaching RM26.5 billion, a 12% increase from 2019. Despite a general decline in remittances due to weaker economic conditions, the sector saw growth in outward remittances through remittance providers, with individual remittances rising by 9% and business remittances by 89% compared to the previous year (BNM Annual Report, 2021).

The Effects of Remittances Outflow

Table 4: The Effects of Remittance Outflow on Economic Growth

Author	Dependent Variables	Independent Variables	Data	Methodology	Results
Alkhathlan (2013)	Real GDP	Outflow of workers' remittances, government expenditure, export, inflation	Saudi Arabia, 1970 - 2010	Autoregressive distributed lag (ARDL), Error Correction Model (ECM)	Negative but statistically insignificant relationship between the outflow of workers' remittances in the long run but a negative and statistically significant relationship between workers' remittances and economic growth in the short run.
Edrees	Natural log	Natural log of	United Arab	Autoregressive	The negative impact is in

(2016)	of GDP per capita	foreign workers and natural log of outflow remittances	Emirates, Saudi Arabia, and Qatar, 1985 to 2014	Distributed Lag approach (ARDL)	the long term. It is not significant in the short term.
Al Kaabi (2016)	Real GDP	Real remittances outflow, CPI inflation rate, government spending as a percentage of GDP, exports as a percentage of GDP, previous year investment as a percentage of GDP	Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates (GCC countries), 2004 - 2014	Panel Data	Growth in remittance outflows affects growth in real GDP only in the case of Saudi Arabia.
Rahmouni and Debbiche (2017)	real per capita gross domestic product	Personal remittance outflows, gross fixed capital formation, general government final consumption Expenditure, trade openness, human capital	Saudi Arabia during the period 1970 to 2014	Autoregressive Distributed Lag approach to Error correction modeling (ARDL-ECM)	Both in the long and short term, remittances outflows have no significant effect on GDP.
Naidu, et. al. (2017)	GDP growth rate	remittance outflows	Japan	Granger Causality Model	In the long run, a 1% increase in remittance outflows will decrease the GDP growth rate by 0.000793%. In the short run, a 1% increase in remittance outflows and inflows will decrease the GDP growth rate by 0.000599% and 0.000327% respectively.
Ouni and Miniaoui (2019)	Economic Growth	Remittance Outflow	GCC Countries	Panel Techniques	Remittances have a +ve and significant impact on economic growth.
AlHarbi (2022)	non-oil economic growth (NOGDP)	Labor force, capital formation, remittance outflows,	Saudi Arabia, 1990 to 2020	Nonlinear Autoregressive Distributed Lags (NARDL)	Remittance outflows in the Saudi economy have an unbalanced and considerable impact on NOGDP. However, the positive coefficients of negative and positive shocks in remittance outflows indicate the benefits of remittance outflows to the Saudi

					non-oil sector.
Islam & Alhamad (2023)	economic growth	Remittance outflow	Saudi Arabia 1985 to 2019	Nonlinear Autoregressive Distributed Lags (NARDL) technique	Confirm a cointegrating association among variables and reveal that RO has mixed but negative resultant impacts on the EG in the short run, while in the long run, EC growth is augmented if remittance outflows decline.

The Effects of Remittance Outflow Worldwide

Overall, research on remittance flows has expanded, but the emphasis has predominantly been on remittance inflows. The limited focus on outflows is attributed to their relatively small impact on major macroeconomic indicators in sending economies and the preference of policymakers and development economists for studying the development impacts of inflows. Studies on remittance outflows are relatively recent, with the earliest research emerging in 2013. Current literature primarily examines the effects of remittance outflows on macroeconomic variables such as economic growth, monetary policy, and inflation, with most empirical evidence concentrated in Gulf Cooperation Council (GCC) countries (Naufal & Genc, 2017).

Among the existing research, studies by Alkhathlan (2013), Edrees (2015), Al Kaabi (2016), Rahmouni and Debbiche (2017), Naufal and Genc (2017), and Al Harbi (2022) examine the impact of remittance outflows on GDP. Table 3.1 provides a summary of the variables used, the data sources, study periods, methodologies, and key findings of these studies. Overall, the findings regarding the effects of remittance outflows on economic growth are mixed. Most of these studies employ the ARDL (Autoregressive Distributed Lag) approach to analyze both the long-term and short-term relationships among the relevant variables.

Termos, Naufal & Genc (2013) and Al Kaabi (2016) investigate the impact of remittance outflows on inflation in the countries from which remittances originate. Table 5 outlines the variables examined, data sources, study periods, methodologies, and key findings of these studies. Both studies utilized panel data to analyze the relationship between remittance outflows and inflation.

Table 5: The Effects of Remittance Outflow on Inflation

Author	Dependent Variable	Independent Variables	Data	Methodology	Results
Termos et. al. (2013)	Inflation	Past inflation, remittance outflows, GDP, trade, current account, national debt, price of oil, interest rate	Six GCC countries, 1972 - 2010	Ordinary least squares (OLS), fixed effects (FE), and Anderson - Hsiao (AH) estimations	Remittance outflows affect inflation negatively.
Al Kaabi (2016)	CPI inflation rate	Growth in nominal remittance outflows, crude oil price inflation rate, growth in money supply	Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates (GCC countries), 2004 - 2014	Panel Data	Growth in remittance outflows affects inflation only in the case of Bahrain.
Sbia and	Inflation	Remittance	14 OPEC	Bias-corrected	Remittance outflows

Hamdi (2021)	Rate	Outflows	countries from 1980-2012	least-squares dummy variable (CLSDV) estimator	do not affect the inflation rate.
Al-Abdulrazag & Foudeh (2022)	Inflation	Remittance Outflow	Saudi Arabia from 1971–2019	Autoregressive distributed lag (ARDL) model	There is a significant negative impact of inflation on remittance outflows, and the short-run and long elasticities of remittance with respect to inflation are 0.26% and 0.32% respectively.

4. The Remittance Outflow Effects on the Malaysian Economy

A review of various databases reveals that research focusing specifically on remittance outflows in Malaysia is limited. Notable studies include Razali et al. (2016), who examined the short-run and long-run relationships between remittance outflows and economic growth in Malaysia from 1982 to 2014. Their findings indicated that remittance outflows had a significant positive impact both in the short and long term. Another key study by Taasim (2020) explored the relationship between per capita GDP and remittances in Malaysia from 1987 to 2018 using the nonlinear autoregressive distributed lags (NARDL) approach introduced by Shin et al. (2014). The results demonstrated that remittances have a substantial short-term and long-term effect on capital accumulation in Malaysia, indicating their role as a significant source of external capital and investment that supports economic development. Additionally, Mehmood et al. (2020) investigated whether remittance outflows and exchange rate fluctuations affect domestic private investment in ASEAN countries, employing panel cointegration techniques in their analysis.

Compared to remittance outflow, the existing literature on the effects of remittance inflow on the Malaysian economy is more. It was studied by Chandio et al., (2023), Hien (2017), and Koay and Choong (2013). Chandio et al., (2023) found that remittance inflows significantly boost agricultural output in the estimation of the long run in selected emerging Asian economies including Malaysia. Hien (2017) found that remittance influences the trade balance positively. Malaysia did not face a symptom of Dutch disease impacted by the remittance. Koay and Choong (2013) found that remittances and financial development are statistically significant in affecting the economic growth of Malaysia. While Fagerheim and Garvik (2015) found that remittances have a mixed impact on economic growth. Other studies on remittance outflow in Malaysia were conducted by Mosfi et. al. (2013) and Fara Diva (2008) as in Table 6.

Table 6: Other studies related to remittance outflow in Malaysia

Author	Objective	Results
Mosfi et. al. (2013)	Descriptively analyze the demographic and socioeconomics of foreign workers in the oil palm plantation sector on remittances.	Demographic and socioeconomic characteristics are significant in explaining the pattern, decisions, and motivations for sending money to the homeland.
Mustapa & Pasquire (2007)	Identify the spending and remittance patterns of construction immigrant workers in Malaysia.	These workers spend less than Malaysian nationals and remit most of their income to their home country.

5. Conclusion

Effectively managing foreign workers and optimizing remittance outflows for Malaysia's benefit requires a

comprehensive, multifaceted approach that addresses economic, regulatory, and social aspects. It is essential to streamline and modernize the immigration and labor documentation processes to ensure that all foreign workers are properly registered. This would help to reduce illegal employment, facilitate the monitoring of labor flows, and mitigate human trafficking. Strengthening enforcement against the employment of undocumented workers is also crucial to ensure that companies hire through legal channels, which would enhance the regulation and oversight of remittance flows. Furthermore, the implementation of training and upskilling programs for foreign workers would enable them to contribute more effectively to Malaysia's economy, reducing dependence on lower-skilled labor and fostering more productive work environments. Additionally, improving the living conditions of foreign workers can lead to higher productivity and foster positive economic contributions, thereby alleviating social tensions between foreign workers and the local population.

To encourage foreign workers to retain a larger portion of their earnings within Malaysia, the government can implement a range of financial incentives. For example, banks could be encouraged to offer competitive savings account rates specifically designed for foreign workers, while partnerships with businesses could provide discounts or reward programs, further motivating local expenditure. Additionally, foreign workers should be incentivized to invest part of their earnings in local financial products, real estate, or businesses. This could include participation in government bond schemes or other secure investment instruments, ensuring that a portion of their income remains in Malaysia, thereby contributing to the domestic economy.

To ensure the stability of the financial system and to effectively track remittance outflows, most remittance transactions must occur through formal channels such as banks or regulated remittance companies. Collaboration between the government, banks, and money transfer operators could focus on reducing transaction fees and simplifying the remittance process, thereby encouraging the use of these formal pathways. Furthermore, the implementation of a minimal tax on remittance outflows could generate additional revenue that can be reinvested in initiatives benefiting both local populations and foreign workers. However, such taxes must be applied cautiously to avoid driving transactions into informal channels, which could undermine the regulatory framework.

Bilateral agreements with countries such as Indonesia, Bangladesh, and Nepal, which are key sources of foreign labor, could incorporate cooperative frameworks aimed at managing remittances and fostering shared development programs. Joint investment initiatives or projects could ensure that remittance outflows are utilized productively in both Malaysia and the workers' home countries. In the long term, Malaysia should work towards reducing its dependence on low-skilled foreign labor by increasing investments in automation and technology, particularly in key sectors like agriculture, construction, and manufacturing. This shift would enhance productivity while decreasing the need for foreign workers.

Additionally, creating incentives for Malaysians to engage in sectors that are currently reliant on foreign labor could further reduce dependency on foreign workers. Targeted vocational training programs, especially for individuals in underserved rural areas, could help develop the local workforce, enabling Malaysians to fill labor gaps in industries such as construction and agriculture. These measures would not only bolster Malaysia's labor market resilience but also contribute to long-term economic sustainability.

Malaysia should also improve data collection on the number of foreign workers, their countries of origin, remittance behavior, and economic contribution. This data can help in making more informed policies related to labor migration and remittance outflows. Implementing a labor market matching system can ensure that only the required number of foreign workers are brought in to fill specific gaps in the economy, preventing oversupply and social tensions. Employers should be incentivized to ensure the well-being of their foreign workers. This includes ensuring fair wages, appropriate accommodations, and adequate healthcare. Encouraging a partnership approach between the government, employers, and workers can help create a sustainable and balanced system. By focusing on these areas, Malaysia can better manage its foreign workforce and redirect remittance outflows in a way that supports both the domestic economy and the well-being of foreign workers.

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Evaluating the Impact of AI Dependency on Cognitive Ability among Generation Z in Higher Educational Institutions: A Conceptual Framework

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Abstract: This research aims to examine the factors of AI dependency (AID) and to investigate the relationship between AI dependency on cognitive ability (CA) among Generation Z (Gen Z) in higher educational institutions. The factors involved are academic self-efficacy (ASE), academic stress (AS), and performance expectation (PE). In this research, the proposed research design is a quantitative method. A self-administered questionnaire will be distributed to respondents, a group of students who were born between 1997 to 2012, and the AI user. The questionnaire will be utilizing the Google Form platform for easier data collection. A snowball sampling method will be applied. Then, the data collected will be analyzed through the partial least square (PLS-SEM) technique. The research findings are expected to highlight the significant emphasis on the contributing factors of AI dependency among Gen Z students. Then, the findings will also provide a model to understand better the impact of AI dependency on cognitive ability. Additionally, it is foreseen that the findings will help various parties, including the government, to create better models for helping Gen Z students apply AI in decent ways to help them increase their cognitive ability. It is also considered a long-term strategy to become a nation with numbers of high cognitive ability citizens. Further, a practical framework based on AI dependency on cognitive ability will be developed as a guideline to support the effort of the government or industry practitioners to increase awareness among Gen Z students on how crucial to possess high cognitive ability.

Keywords: *Digital Native*, *Artificial Intelligence, AI Dependency, Cognitive Ability, Generation Z, Higher Educational Sector*

1. Introduction

Artificial intelligence (AI) is a technology that allows computers and machines to mimic human abilities such as learning, understanding, problem-solving, decision-making, creativity, and independence. (Stryker & Kavlakoglu, 2024). The swift rise of AI as a transformative technology is altering every facet of our lives. (Lund & Wang, 2023). The advancement of AI is no exception it has been transforming numerous industries including education. AI in education involves utilizing technologies like machine learning and natural language processing to improve the learning experience. (Alneyadi, et al., 2023). The thriving of AI applications in education has received a ton of attention and is fast becoming a hot topic in policy debates (Miao & Holmes, 2021). It is said that AI applications can bring significant benefits to both students and teachers in the education sector. Such as the digitalization of educational resources, gamification, and personalized learning experiences (Zhai, et al., 2021). Further, according to Harry & Sayudin (2023), AI also could benefit the education sector in many spectrums such as personalized learning, increased efficiency, and improved student engagement in learning. Previous research done by Zhang & Aslan (2021) also stated that AI applications in education can help to provide customized learning, offer dynamic assessments, and facilitate meaningful interactions in online, mobile, or blended learning experiences among teachers and students. It can be summarized that AI applications indeed add value in the education sector, which both students and educators exploit widely to improve or accelerate the academic process and to develop additional skills and competencies.

In this research, the focus is given to the students among Generation Z (Gen Z) in higher educational institutions which refers to the youngest generation born between 1997 and 2012, who are digital natives growing up in a world where technology, smartphones, and the internet are integral parts of their daily lives (Slepian, Vincent, Patterson, & Furman, 2024). The selection of Gen Z is because this generation, born and raised in an era where technology is omnipresent, finds itself intricately entwined with digital tools and platforms from an early age. Additionally, Gen Z students are authentic digital natives who are a hyper-cognitive generation with different

student profiles than before (Hernandez-de-Menendez, Díaz, & Morales-Menendez, 2020). Further, Gen Z was generally optimistic about the potential benefits of AI, including enhanced productivity, efficiency, and personalized learning, and expressed intentions to use AI for various educational purposes (Chan & Lee, 2023). Previous research done by Chen, Jensen, Albert, Gupta, & Lee (2023) on AI in education, it was found that AI systems have enabled the customization and personalization of curriculum and content according to students' needs, leading to improved learning experiences, and overall educational quality. Nevertheless, the usage of AI leads to over-dependence on it due to a few factors such as academic self-efficacy, academic stress, and performance expectations (Zhang, Zhao, Zhou, & Kim, 2024). These factors somehow can lead to a decrease in cognitive abilities. Despite the benefits of AI in helping students with academic tasks, there is a noticeable gap in the factors that can lead to AI dependency and how the relationship between AI dependency and cognitive abilities. Due to that, this research is conducted to fill the gap mentioned above. Then, the findings are expected to highlight the significant emphasis on developing a more decent way of using AI.

There are four sections in this research, which are generally organized accordingly. Section 2 discusses the related literature to support this research's importance on AI dependency and cognitive abilities. It is then followed by Section 3, which reports the methodology that will be used throughout the research. Finally, Section 4 concludes the research.

2. Literature Review

AI in Education

AI in education refers to the use of AI techniques and tools to improve student's learning processes, personalize teachers' course materials, monitor school performance through data analysis by school administrators, and improve educational policies. (Üstün & Yavuz, 2024). Furthermore, AI in education is currently considered as an education assistant at the early stage, while AI-enabled education will play a more important role as learning requirements change. (Chen, Chen, & Lin, 2020). In the aspect of Gen Z and AI, it is generally optimistic that AI would be beneficial including enhanced productivity, efficiency, and personalized learning, and expressed intentions to use AI for various educational purposes. (Chan & Lee, 2023). However, despite all the benefits associated with AI, there is a noticeable gap in investigations on how AI dependency affects students' cognitive abilities (Zhai, Wibowo, & Li, 2024). This trend has led to a decline in the quality of how students learn through AI in education. As a result, AI in education is expected to play a more important role in students' lives, especially Gen Z. Hence, this section provides the background to this research, including its research model and related works.

AI Dependency (AID)

According to Zhang, Zhao, Zhou, & Kim (2024), AI dependency is defined as an excessive reliance on AI technologies and applications across various aspects of life, including academic studies, daily routines, and social interactions. This form of dependency is marked not only by the overutilization of AI-assisted tools but also by a significant psychological dependence on these technologies. Additionally, Zhang, Zhao, Zhou, & Kim, (2024) also mentioned that three factors influence AI dependency among students, which are academic self-efficacy (ASE), academic stress (AS), and performance expectation (PE). In this research, the three variables will be used to examine the factors of AI dependency among Gen Z in higher educational institutions and how it reflects their cognitive abilities.

Academic Self-Efficacy (ASE) and AI Dependency (AID)

Academic self-efficacy refers to perceived capabilities to learn or perform actions at designated levels in academic settings (Schunk & DiBenedetto, 2022). It is grounded in Bandura's social cognitive theory which reflects confidence in the ability to exert control over one's own motivation, behavior, and social environment, depending on the task or situation (Bandura, 1986). Individuals with high academic self-efficacy beliefs demonstrate a keen sense of confidence in their ability to effectively plan, organize, and execute academic tasks (Parmaksız, 2022). Based on the study, it is believed that individuals with higher academic self-efficacy tend to have a higher level of confidence in their ability to plan, organize, and carry out academic tasks effectively. Those with lower academic self-efficacy demonstrate lower enthusiasm for learning engagement as compared to those with higher academic self-efficacy (Cheng, 2020). As a consequence, students who lack academic self-efficacy are more likely to experience frustration and may struggle to complete their academic tasks. In these

situations, they may turn to external assistance, such as ChatGPT, or any convenient AI option, to help make up for their challenges. ChatGPT allows students to obtain quick and direct answers by simply asking questions, which may enhance their academic performance in the short term (Rahman & Watanobe, 2023). Therefore, students may depend more on AI for quick solutions instead of tackling problems on their own. In the long run, students with low academic self-efficacy are likely to over dependent on AI. A previous study conducted by Hong, et al., (2021) has confirmed that there is an impact of academic self-efficacy on the inappropriate use of technology. In this research, the technology refers to the use of AI in academic settings among Gen Z students.

Academic Stress (AS) and AI Dependency (AID)

Academic stress (AS) is a pressure that arises or is caused by academic conditions (Hakim, Fajri, & Faizah, 2022). For instance, according to Yang, Chen, & Chen, (2021), students claimed that academic-related pressures such as ongoing study, writing papers, preparing for tests, and boring professors were the most important daily problems. Additionally, academic stress is a key social-cognitive factor that contributes to problematic technology use. AI technology offers students a convenient and fast way to access academic answers, helping to meet their immediate academic needs and alleviate academic stress (Zhu, Qin, Yang, Dodd, & Conti, 2023). In the end, students become more susceptible to dependence on AI. Based on the associations between academic stress and AI dependency, Gen Z students who experience greater academic stress are more likely to depend on AI to meet their academic needs.

Performance Expectation (PE) and AI Dependency (AID)

A performance expectation (PE) is performance expectations as the degree to which individuals believe that utilizing a specific technology improves their performance (Dwivedi, Rana, Jeyaraj, Clement, & Williams, 2019). In the education aspect, performance expectation refers to aid for assessment by clarifying what students should be able to know and do at the end of the grade or grade band. (National Science Teaching Association (NSTA), 2024). This cognitive factor significantly influences the attitudes of potential users, which in turn impacts their willingness to adopt and engage with technology. When students expect that AI will enhance their academic performance, they are more likely to depend on it. As a result, this research views that performance expectations may influence the dependency on AI. Therefore, it can be summarized that Gen Z students with higher performance expectations tend to integrate AI tools into their academic-related tasks, leading to the over-dependent of AI as a coping strategy (Zhang, Zhao, Zhou, & Kim, 2024).

Cognitive Ability (CA)

Cognitive abilities (CA) of critical thinking, decision-making, and analytical thinking are important elements in research, particularly in higher education. (Soufi & See, 2019). In the education sector, CA is essential to help students acquire knowledge, develop learning skills, and recognize their style of education. With AI replacing more tasks, there is growing debate about whether this AI dependency is enhancing the students' efficiency or diminishing their cognitive ability. Understanding this balance is crucial as it navigates an era where AI and students' cognition abilities intersect more deeply than ever before.

AI Dependency (AID) and Cognitive Ability (CA)

Students might unintentionally depend too much on AI tools, which could undermine their capacity to make independent, informed decisions (Buçinca, Malaya, & Gajos, 2021). When the usage and dependency of AI are increased, this will automatically limit the human brain's thinking capacity (Ahmad, et al., 2023). Many previous studies stated that excessive reliance on AI tools among Gen Z can diminish critical thinking skills, reduce creativity, and impair their ability to engage in independent learning, ultimately affecting their cognitive development. It is proven that there is still a noticeable gap in the current literature exploring the impact of over-dependent AI tools on cognitive abilities in education and research (Ahmad, et al., 2023). Therefore, this research is conducted to fill the knowledge gap by developing the framework to show the factors of AI dependency among Gen Z students in higher educational institutions and to assess the relationship between AI dependency and cognitive abilities.

Figure 1: A Conceptual Framework of AI Dependency on Cognitive Ability

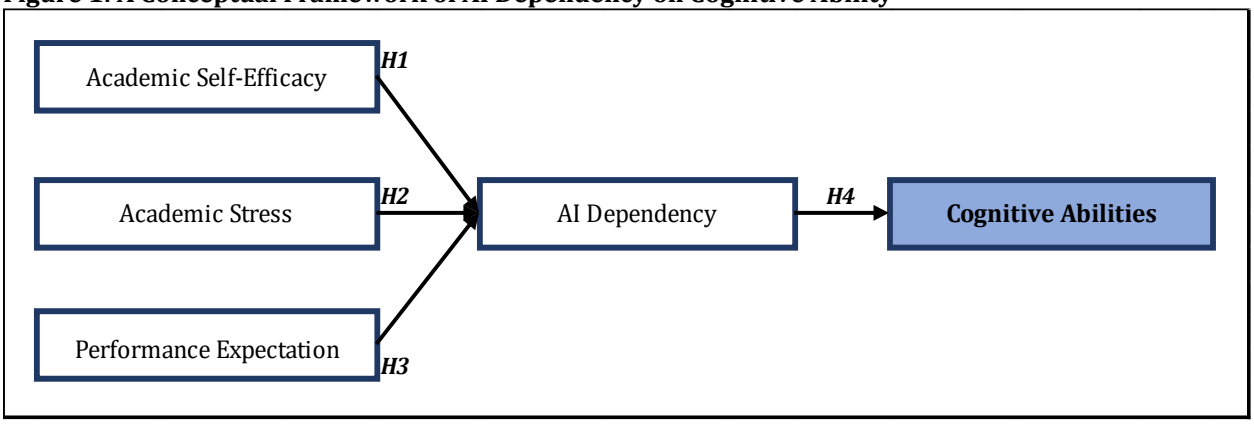


Figure 1 illustrates the factors of the ASE, AS, and PE in contributing to AI dependency (AID). The AI dependency will then be examined to see its relationship with cognitive ability among Gen Z in the higher educational sector. Based on the Figure 1, the following hypotheses are formulated:

H1*: There is a relationship between academic self-efficacy and AI dependency among Generation Z in higher educational institution*

H2*: There is a relationship between academic stress and AI dependency among Generation Z in higher educational institution*

H3*: There is a relationship between performance expectation and AI dependency among Generation Z in higher educational institution*

H4*: There is a significant impact of AI dependency on cognitive ability among Generation Z in higher educational institution*

3. Research Methodology

This research investigates the impact of AI dependency on cognitive ability among Gen Z. A quantitative research approach will be employed to comprehensively examine the factors of AI dependency and the relationship between AI dependency on cognitive ability.

Sampling and Data Collection

The target population consists of students in higher institutions that are born between 1997 to 2012, and the unit of analysis will be the user who relies on the AI tool to do their academic-related work. The reason for focusing on students that are born between 1997 to 2012 as a subject in this research is to align with the research objective which focuses on Gen Z in the higher educational sector.

Questionnaire Construction

A set of survey questionnaires will be used in this research, which will be segmented into main three sections. Section A focuses on the demographic information. Meanwhile, Section B hinges on the factors of AI dependency. Lastly, Section C examines the relationship between AI dependency and cognitive ability. Furthermore, the researchers will develop Sections A, B, and C based on the suitability of the research. Before the main sections are developed, the preliminary section will be developed to include informed consent that mainly explains the purpose of the study, voluntary participation in the survey, and assurance that their response/data will only be used in this study and will be strictly treated as confidential. Then, there will be questions asking about the born year and AI usage. Hence, only those with the required following criteria are allowed to proceed to respond to the survey questionnaire:

- Agreed to participate through informed consent
- Born in 1997 to 2012 only
- AI users – academic purpose

Then, the selected experts will validate the questionnaire's accuracy and validity. Once validated, one pilot test

will be conducted to test the questionnaire. Once done, the finalized questionnaire will be distributed through an online platform. Further, a snowball sampling method will be applied in this research which refers to a non-probability sampling method where new units are recruited by other units to form part of the sample. (Nikolopoulou, 2023). He added that snowball sampling can be a useful way to research people with specific traits who might otherwise be difficult to identify. The goal of snowball sampling in this research is to obtain a large number of Gen Z students who have been used and exposed to AI in higher educational institutions. In this research, it is challenging to engage with Gen Z students who utilize AI tools for academic purposes. Therefore, this method will be an appropriate approach and will be implemented in two steps:

Identify potential participants in the population.
The candidates will be asked whether they are an AI user. If not, they can't proceed to further the questions. Hence, the research can limit only Gen Z students who are using AI for academic purposes as the subjects.

Ask those participants to recruit other people.
It begins with one or more study Gen Z students. It then continues based on referrals from those students. This process continues until the research reaches the desired sample or a saturation point. (Nikolopoulou, 2023)

Table 1 summarizes the questionnaire construction.

Table 1: Summary of Questionnaire Construction

Section	Items
Preliminary section	Informed Consent Born Year AI User or Not
Section A: **Demographic Information**	Gender Marital status Education level Race Dependency level on AI Purpose of Using AI
Section B: **The Factors of AI Dependency**	Academic Self-Efficacy Academic Stress Performance Expectation
Section C: **The AI Dependency on Cognitive Ability**	AI Dependency on Cognitive Ability

Data Analysis
Once data is collected, it will be analyzed by employing the Partial Least Squares-Structural Equation Modelling (PLS-SEM) tool. The PLS-SEM method has become increasingly popular over the past two decades and more to analyze such models in business discipline (Hair, et al., 2021) and information systems (Benitez, Henseler, Castillo, & Schuberth, 2020). The primary statistical objective of PLS-SEM I prediction is that minimize the amount of unexplained variance in the structural model's dependent constructs and the measurement model's indicators (Sarstedt, Ringle, & Hair, 2022). Besides, it is said that PLS-SEM provides more flexibility to explore and experiment with numerous configurations (Dash & Paul, 2021). Hence, it is shown to be a suitable tool to be applied in the analysis of abnormally distributed data. In this research, the PLS-SEM is a powerful tool in providing evidence of the reliability and validity of the relationship between AI dependency and cognitive ability.

4. Discussion and Conclusion

The growing dependency on AI tools among students, particularly within Gen Z, raises significant concerns regarding cognitive abilities. While AI can enhance learning and provide quick access to information, it can also lead to detrimental effects if relied upon excessively. In this research, three factors led to the over-dependent on AI usage, which are academic self-efficacy, academic stress, and performance expectation. Then,

the AI dependency is examined to view the relationship between AI dependency and cognitive abilities. A set of surveys will be distributed to students who are Gen Z and AI users. Then, the data collected will be analyzed through the partial least square (PLS-SEM) technique. The research findings are expected to highlight the significant emphasis on the contributing factors of AI dependency among Gen Z students. Then, the findings will also offer a framework for better understanding the effects of AI dependency on cognitive ability. Moreover, it is expected that the findings will assist various stakeholders, including the government, in developing improved strategies to help Gen Z students use AI appropriately, thereby enhancing their cognitive abilities. It is also viewed as a long-term strategy to cultivate a nation with a significant number of citizens possessing high cognitive abilities. Further, a practical framework addressing AI dependency and cognitive ability will be created to guide all educational institutions, especially at a higher level in raising awareness among Gen Z students about the importance of developing high cognitive abilities. Moreover, students with strong skills in current technologies like AI, along with high cognitive abilities, would be a significant asset to the industry later on. Hopefully, the research will be beneficial to all AI users, especially Gen Z students and educational institutions.

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Customer Satisfaction Towards Food Delivery Services in Selangor

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Abstract: This study explores the key factors influencing customer satisfaction with food delivery services at UiTM Puncak Alam, Selangor. Despite the rising demand for food delivery services, issues surrounding the quality and accuracy of delivered food remain significant challenges. This study seeks to address these concerns by identifying and analyzing the determinants that shape customer satisfaction with food delivery services in Malaysia, specifically in Puncak Alam. We adopted a quantitative research approach to gain comprehensive insights into these issues. We collected data using judgment sampling, a non-probability sampling technique and used the Statistical Package for Social Sciences (SPSS) to analyze the responses through descriptive statistics and correlational analysis. The study involved a structured survey of 357 respondents, investigating the impact of three key variables—food quality, app ease of use, and food packaging—on customer satisfaction. The findings provide important implications for businesses and institutions looking to enhance the quality of food delivery services and elevate customer satisfaction levels. By identifying these critical factors, the research offers valuable insights that can help food service providers, policymakers, and industry stakeholders refine their strategies. These insights will not only improve the customer experience but also encourage broader adoption of food delivery services within the Malaysian population. Ultimately, the study's conclusions hold significance for enhancing service quality and fostering customer loyalty in the increasingly competitive food delivery industry.

Keywords: *Customer Satisfaction, Food Delivery Service, Food Quality, Food Packaging.*

1. Introduction and Background

Food delivery services in Malaysia have experienced rapid growth, driven by increased urbanization, busy lifestyles, and widespread smartphone use. The sector saw a significant boost during the COVID-19 pandemic, as people relied more on online food orders while staying at home. According to Dazmin and Ho (2019), Malaysia provides two types of food delivery services: retailers and restaurant intermediaries. For instance, retailers in the fast-food industry, such as McDonald's (MCD), Kentucky Fried Chicken (KFC), and Pizza Hut, generally provide delivery services by charging an additional transportation fee. Popular platforms like GrabFood, Foodpanda, and ShopeeFood dominate the market, offering a wide range of restaurant choices, from local eateries to international chains. These services are app-based, allowing users to order food from nearby restaurants and have it delivered to their doorstep.

Current research indicates that since 2019, when the COVID-19 virus attacked the world, the number of food delivery services has continued to rise. So, all people must stay at home and cannot go out; food shops are closed, and people are only allowed to go out if something is important. Therefore, to prevent customers from being in proximity and crowded at restaurants that are allowed to open, the government allows this food delivery service to operate where only those who can buy at the restaurant can deliver to customers according to what the customer ordered. On the other hand, statistics show a significant increase in food delivery service usage over the last few years. For example, Statista reported that global internet meal delivery sales were $107.4 billion in 2019. However, due to pandemic-related demand, we expect this figure to rise to $151.5 billion in 2020, a nearly 41% increase. During the pandemic, as customers chose to use online ordering and buying food to maintain social distancing and prevent infection, online sales increased by 90% between February and March (Tan & Kim, 2021). Online food ordering and online grocery applications or platforms have become popular. Furthermore, estimates indicate continuous expansion, with the worldwide online meal delivery market estimated to reach $182.3 billion in 2024.

In the current era of convenience and rapid technological advancements, the quality of food delivery services

has become a critical concern. Due to increasing competition, food delivery service providers must thoroughly understand consumer perceptions and expectations to retain and attract customers (Banerjee et al, 2019). Despite the ease of ordering food through various platforms that promise satisfaction at the swipe of a screen, issues regarding the quality and accuracy of delivered food persist. Factors such as improper packaging, spillage, delays, and food temperature affect service quality. The evaluation of perceived service quality varies across industries (Chowdhury, 2023), and food delivery is no exception. Concerns about food safety and hygiene further contribute to the declining reputation of service providers. Additionally, discrepancies between advertised claims and actual food quality, such as meals that are not fresh or poorly presented, exacerbate consumer dissatisfaction. Furthermore, the lack of transparency in pricing and hidden fees negatively impacts the consumer experience, eroding trust in these services. Addressing these multifaceted issues is essential to ensuring that consumers can continue enjoying the convenience of food delivery without compromising on taste, safety, or overall satisfaction.

This study plays a crucial role in identifying factors that influence customer satisfaction with food delivery services among staff and students at UiTM Puncak Alam. By examining three key variables—food delivery service quality, app ease of use, and food packaging—this research aims to provide valuable insights into elements that contribute to customer satisfaction. Below are the research objectives (RO) and hypotheses (H) for the study:

RO1: To examine how the quality of food affects customer satisfaction with food delivery service in UiTM Puncak Alam.
H1: There is a relationship between the quality of food and customer satisfaction with food delivery service in UiTM Puncak Alam.

RO2: To examine how the app's ease of use affects customer satisfaction with the food delivery service at UiTM Puncak Alam.
H2: There is a relationship between app ease of use and customer satisfaction with food delivery service in UiTM Puncak Alam.

RO3: To examine the food packaging that affects customer satisfaction with the food delivery service at UiTM Puncak Alam.
H3: There is a relationship between food packaging and customer satisfaction with food delivery service in UiTM Puncak Alam.

2. Literature Review

Customer Satisfaction with Food Delivery Services: Several factors, particularly the evolving preferences of urban consumers who prioritize convenience and speed in meal choices, are driving the rapid growth of online food delivery services. The ease of accessing diverse food options via smartphones is increasingly attracting city dwellers, enabling them to enjoy fresh and nutritious meals at their convenience, whether at home or in the workplace, without the need for travel. Additionally, the rising smartphone penetration in Malaysia has further streamlined the process of online shopping, including food delivery services. This expanding market presents a substantial revenue opportunity, with projections indicating that the food delivery sector could generate USD 956 million annually by 2022, positioning it as one of the fastest-growing segments in the food industry (Chai & Yat, 2019).

Previous research has highlighted key factors influencing customer satisfaction with online food delivery services, including service quality, app usability, and food packaging (Alden et al., 2023). Service quality, particularly timely delivery, order accuracy, and customer support, is critical to maintaining customer satisfaction and loyalty. Consumers expect prompt delivery and the correct fulfillment of their orders, underscoring the importance of consistent, high-quality service (Chai & Yat, 2019).

The ease of use of food delivery apps is another essential factor, as it relates to the app's intuitiveness and user experience. Effective app design ensures clear navigation, identifiable icons, and logical layouts that allow users to complete tasks with minimal effort. Accessibility features, such as adjustable text sizes and voice commands,

are important to accommodate all users, including those with disabilities (Wen et al., 2022). Moreover, food packaging plays a crucial role in ensuring safe and hygienic delivery. Packaging protects the food from contamination and damage during transit while also enhancing convenience for both customers and delivery personnel by providing a secure, portable, and user-friendly container (Mehrolia et al., 2021).

Quality of food: Scholars and experts widely agree that assessing the quality of food delivery services should primarily be based on customer feedback. Recent studies have focused on identifying which service attributes are most critical to enhancing customer experience, encouraging adoption, and boosting customer loyalty (Alden et al., 2023). In UiTM Puncak Alam, the growth of food delivery services has significantly influenced customer satisfaction, offering both an opportunity for food providers to increase revenue and a more convenient experience for customers (Rombach et al., 2023).

This study aims to examine specific attributes of food delivery services, such as customer satisfaction with timely delivery, adherence to delivery instructions (e.g., placing food in a mailbox), the accuracy of delivered orders, and the overall quality of the food. The findings indicate a strong correlation between customer satisfaction and key aspects of the service at UiTM Puncak Alam. For instance, 17 respondents expressed high satisfaction with riders following delivery instructions (Saad, 2021), while another 17 respondents were pleased with the speed of service. These results suggest that prompt and efficient delivery are major contributors to customer satisfaction. Therefore, it can be hypothesized that:
H1: There is a relationship between the quality of food and customer satisfaction with food delivery service in UiTM Puncak Alam.

App ease of use: Perceived Ease of Use (PEOU) measures how intuitive and simple a food delivery app is for customers to use (Alden et al., 2023). This includes factors such as the app's user-friendly design, ease of navigation, and overall functionality. Research consistently shows that when users perceive a food delivery app as simple to use, they are more likely to report higher satisfaction levels. A well-designed app that simplifies browsing menus, placing orders, and completing digital payments enhances the overall user experience and increases customer satisfaction.

Several factors contribute to how easily customers can use a food delivery app. Key among them are the app's features. For instance, the ability to easily navigate through menus, make secure payments, and efficiently complete orders significantly enhances the convenience and overall customer experience. A survey of 17 respondents demonstrated a high level of satisfaction with the efficiency of food delivery services, emphasizing the importance of usability for enhancing customer satisfaction.

Beyond app usability, trust is another critical factor influencing customer attitudes toward online food delivery services. Trust fosters positive behavior and loyalty toward these platforms (Jun et al., 2021). In a study, 17 respondents expressed satisfaction with the trustworthiness of online food delivery services. For example, students who rely on these services during busy periods place their trust in platforms that consistently deliver accurate and timely orders. Trust is essential in ensuring a satisfying experience, particularly in uncertain times, as it reassures customers that the delivered food will meet their expectations and safety standards (Rombach et al., 2023). We hypothesize the following based on the existing literature:
H2: There is a relationship between app ease of use and customer satisfaction with food delivery service in UiTM Puncak Alam.

Food Packaging: In addition to service quality and app ease of use, food packaging plays a crucial role in shaping the overall food delivery experience, influencing factors such as food freshness, presentation, and safety. By selecting appropriate packaging materials and designs, restaurants can ensure that customers receive their orders in optimal condition, thereby enhancing satisfaction and elevating the dining experience (Alamri et al., 2021). Recent research has increasingly focused on the role of food packaging in boosting customer satisfaction and loyalty within food delivery services.

We found that several packaging-related factors significantly impact customers' perceptions of food quality and their overall satisfaction. These include the type of material used, packaging design, and functionality. Packaging materials convey impressions of quality and durability, while design elements—such as color,

graphics, and shape-affect customers' perceptions of the food inside (Ansari & Siddiqui, 2019).

Effective food packaging offers numerous advantages, including enhancing brand image, supporting sustainability efforts, and improving the customer experience. Packaging that maintains food quality and temperature during delivery strengthens customer loyalty and promotes environmental responsibility. For example, 17 respondents expressed satisfaction with the packaging of their food orders, specifically regarding how well it preserved freshness and temperature, underscoring the importance of efficient packaging in driving customer satisfaction.

The study concludes by emphasizing the significant role of food packaging in food delivery services and highlighting the need to consider factors such as material composition, aesthetics, environmental sustainability, and functionality to improve the overall customer experience. We hypothesize the following based on the existing literature:
H3: There is a relationship between food packaging and customer satisfaction with food delivery service in UiTM Puncak Alam.

3. Research Methodology

The research methodology for this study involved distributing a structured questionnaire to 5,000 students across six faculties at UiTM Puncak Alam: the Faculty of Architecture, Planning, and Surveying, the Faculty of Art and Design, the Faculty of Business Management, the Faculty of Health Science, the Faculty of Hotel and Tourism Management, and the Faculty of Pharmacy. The selection of these faculties enabled simple access to the target population. The structured questionnaire served as the primary data collection tool, systematically gathering information to assess the relationships between the independent variables—quality of food delivery services, app ease of use, and food packaging—and the dependent variable, customer satisfaction with food delivery services.

The study adopted a correlational research design to analyze the relationship between the independent variables and customer satisfaction with food delivery services at UiTM Puncak Alam. Correlational research focuses on examining relationships between variables, which means that researchers are interested in how changes in one variable are associated with changes in another variable. This type of research is useful for identifying patterns and trends in data and for making predictions about future outcomes. However, correlational research does not allow researchers to make causal inferences, as it does not involve manipulating variables.

On the other hand, descriptive research focuses on providing a detailed account of a particular topic or phenomenon. This type of research is useful for gaining a better understanding of a topic, as it allows researchers to describe the characteristics of a population or phenomenon in detail. Descriptive research does not involve making predictions or inferences about relationships between variables but rather focuses on providing a comprehensive overview of a topic.

The researchers used judgment sampling, a non-probability sampling technique, to select participants based on their expertise and knowledge of the student population. This method allowed for a purposeful selection of participants who could provide meaningful insights into the factors influencing satisfaction with food delivery services. Judgemental sampling, also known as purposive sampling, is a type of non-probability sampling where the researcher selects participants based on their qualifications or characteristics that are relevant to the study. This type of sampling method allows the researcher to target specific groups of people, such as those who are most likely to provide useful information. The disadvantage of this method is that the sample may not be sufficiently representative of the population under investigation. We selected a total of 357 students as the sample size.

4. Finding and Results

Finding from RO1: Based on the research objective of assessing the satisfaction level of customers with the overall quality of food delivery service in UiTM Puncak Alam, it can be concluded that customer satisfaction

with the overall quality of food delivery service in UiTM Puncak Alam reveals significant insights into various facets of the service. The research findings indicate that the quality of food delivery services, encompassing factors such as timeliness, accuracy of orders, food temperature, and customer service, plays a crucial role in shaping customer satisfaction. Consistent and reliable service, characterized by prompt and accurate order delivery and food that maintains its intended temperature and quality, closely correlates with high levels of customer satisfaction. Conversely, delays, incorrect orders, and poor customer service contribute to dissatisfaction among customers. Therefore, the quality of food delivery services is a pivotal determinant of customer satisfaction in this context.

However, we recommend that service providers focus on improving the identified areas of concern to enhance customer satisfaction with food delivery services in UiTM Puncak Alam. Ensure timely deliveries by optimizing delivery routes and improving coordination between the kitchen and delivery personnel. This can significantly reduce delays. Implementing rigorous quality checks to verify order accuracy before dispatching can minimize errors. Additionally, maintaining food temperature during transit through insulated delivery containers can preserve the quality of food. Providing training to delivery staff on customer service best practices can enhance interactions with customers and foster a positive service experience. By addressing these aspects of food delivery service quality, providers can substantially elevate customer satisfaction levels.

Findings From RO2: The research revealed that the ease of using online food delivery applications is a crucial factor affecting customer satisfaction among UiTM Puncak Alam students. Students expressed higher satisfaction levels when the applications featured user-friendly designs, straightforward ordering processes, and seamless payment systems. Developers should prioritize improving the user interface and experience through regular usability tests to pinpoint and resolve any issues, thereby enhancing customer satisfaction with food delivery services. Additionally, incorporating features such as personal recommendations, real-time tracking, and in-app customer support can further enhance user convenience. Regular updates and improvements based on user feedback are also essential to maintaining a user-friendly application. By prioritizing these aspects, developers can significantly boost customer satisfaction with food delivery services and encourage greater user retention.

Findings From RO3: The findings from RO3 indicate that the customers of UiTM Puncak Alam are generally very satisfied with the food packages provided by the delivery service. Research shows that food packaging consistently meets customer expectations, and many respondents were satisfied with how it maintains food quality and prevents issues such as spills or contamination. The results suggest that the package effectively maintains the intended temperature and food integrity during delivery. This positive reception underlines the importance of quality packaging for improving the customer experience. The results are consistent with previous studies that emphasized the central role of reliable and safe food packaging in customer satisfaction with food delivery services. Overall, the study demonstrates a thorough evaluation of current food packaging practices and their significant influence on the positive attitude of UiTM Puncak Alam customers towards the food delivery service.

5. Conclusion

Customers appreciate precise diet customization options, and there is a clear need for must-have items to accommodate their dietary preferences and allergies. Improving user training and app usability is critical to improving customer satisfaction toward food delivery services, especially for those who are less tech-savvy. In addition, the importance of high-quality and durable packaging to ensure that food arrives in optimal conditions is obvious. Based on these findings, recommendations include implementing robust nutrition customization features, providing comprehensive user guidance within the program, and investing in better packaging solutions. These steps are critical to improving overall customer satisfaction with food delivery services and sustaining service excellence in a competitive market. Addressing these areas will help food delivery services meet and exceed customer expectations, ensuring a better overall experience and fostering long-term loyalty.

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The Factors Affecting the Awareness of Young People on Sexual Transmitted Infections (STIS): Knowledge, Attitude and Environment

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Abstract: The outbreak of sexually transmitted infections (STIs) in the nation is not something new; in fact, the issue has been around for many years and has been steadily becoming worse over that time. The problem becomes more crucial as each year; an increasing number of cases will be reported in Malaysia and throughout the world. In some cases, symptoms of STIs may not even be present. This can mean that a person might get infected by another person who might appear healthy without knowing they have already been infected with STIs; therefore, this article aims to investigate the knowledge, attitudes, and environment as the factors that influence awareness of Sexual Transmitted Infections (STIS) among the 227 of youths. A survey was conducted, and the data was analyzed using regression analysis. The result revealed that knowledge, attitude, and environment had a significant influence on sexually transmitted infections. In addition, the environmental factor reported had the most significant influence. The finding implies that external roles, such as those of the government, schools, and universities, should be provided with more facilities and programs to sustain and improve awareness among the youth group. Furthermore, increasing youth awareness may change individual behavior and attitude toward a good, healthy lifestyle.

Keywords: *Sexually Transmitted Infections (STIs), Knowledge, Attitude, Environment, Lifestyles*

1. Introduction and Background

Sexually Transmitted Infections (STIs) have become a significant public health in Malaysia, especially among youth. STIs are a type of infection that is passed from person to person through sexual activity. STIs, also known as Sexually Transmitted Diseases (STDs), are caused by bacteria, viruses, and parasites that can spread through sexual intercourse, blood transfusions, or the use of contaminated needles. STIs or STDs are spread through the vagina, oral and oral sex. The most reported STIs are Chlamydia, Gonorrhea, Syphilis, Trichomoniasis, M genitalium HIV, and Human papillomavirus (HPV). Depending on the type of infection, significant symptoms could be visible, or there might not be any physical manifestations. Hence, the infections could silently be transmitted among healthy-looking people. The past years have highlighted a rise in cause for concern regarding an increased number of STIs in terms of cases, treatments, and deaths in Malaysia.

Several media in Malaysia reported an increased incidence or undetected cases of Syphilis, Hepatitis C, and HIV infections. The substantial increase in STIs has provoked this alarming information. In fact, according to the STIs Department in the Federal Health Ministry, there were 131,830 cases of STIs, with Syphilis disease representing most cases and patients, especially among young people. With this situation, one of the problems that many researchers have identified is a lack of awareness even though many initiatives and programs have been provided to young people (Zhang et al., 2013) despite all the advancements in technology and easy access to information such as internet and social media platforms including Instagram, X and Tiktok, the current generation might not be equipped with the awareness of STIs among young people. In addition, undeniably, the influence of peers, lifestyle, and risky behavior contributed to the spreading of infections (Simanjuntak, Keperawatan, & Rebo, (2023). Young people have an open social lifestyle and yielding on the impact of the STIs. Apart from that, the lack of conversation led to young people's misunderstanding and ignorance in taking preventive action. Therefore, the study aims to measure the knowledge, attitudes, and environmental factors influencing awareness of STIs among young people.

2. Literature Review

In this literature review, there was a comprehensive discussion on previous researchers' awareness, knowledge, and environment towards sexually transmitted infections to develop the hypotheses of this study.

Awareness towards Sexual Transmitted Infections (STI)

STIs spread as a public health problem worldwide. People should be aware of it to prevent the disease from spreading fast and create a healthier society. Although the disease spreads worldwide, the evidence shows that most people, especially young people, are unaware of the implications and the prevention. Shinkre et al. (2023) state that young people, specifically young people, have low awareness of STIs. This, in turn, risks increasing their social stigma and hinders the people's ability to control sexual diseases. Even though most young people have a positive attitude towards sexual health issues, their knowledge of STIs is limited. Overall, this means STI cases among youth are probably increasing, and some contributing factors include knowledge, attitude, and environment. According to certain studies, one factor that contributes to an absence of information is a gap in awareness regarding STIs. It has been mentioned by Anwar et al. (2010) that this is the case, and people's misconceptions and lack of awareness about the most common non-HIV STIs put them at greater risk for negative consequences caused by their sexual behavior. Furthermore, there could be a need for more concern regarding STIs because they might be viewed as easily treatable. In addition, Folasayo et al. (2017) pointed out that the majority of young people lacked an awareness of the potential implications that could result from their behavior. Therefore, the hypothesis proposed as follows:

H1: There is a relationship between knowledge and awareness of STIs.

Knowledge towards Sexual Transmitted Infections (STIs)

Young people's knowledge, or lack thereof, about STIs plays a critical role in the spread of infections. Inadequate sexual education, coupled with misconceptions, stigma, and the influence of peer norms and social media, creates an environment where risky behaviors thrive. Improving access to comprehensive sexual health education and providing clear, accurate information about STI prevention and treatment are essential steps in reducing the spread of STIs among young people. This could be explained as many young people lack access to comprehensive sexual education, which covers not only abstinence but also contraception, condom use, and STI prevention. In many educational settings, sex education is either omitted or focused solely on abstinence, leaving young people uninformed about safer sexual practices. A study by the Guttmacher Institute found that youth who received comprehensive sex education were significantly less likely to engage in risky sexual behaviors compared to those who received abstinence-only education. Without this vital knowledge, young people are more likely to engage in unprotected sex, increasing the risk of STI transmission.

Attitude towards sexually transmitted Infections (STIs)

Young people's attitudes toward sexually transmitted infections (STIs) can significantly decrease by adopting a positive attitude that is based on openness, a willingness to learn about sexual health, and a dedication to safe sexual practices (Sham, Yaakub, Fawati, Fatinni, & Azamuddin, 2020). On the other hand, a negative attitude is commonly a tendency to stigmatize and discriminate against people with STIs which might lead to delayed diagnosis and treatment. It is commonly known that various circumstances, including their friends, can impact young university people's risky attitudes. This is further supported by a study conducted by Folasayo et al. (2017). Peers have an impact on risky behaviors such as drinking alcohol, using drugs and watching pornographic movies. While a positive attitude alone cannot guarantee complete protection from STIs, it can be a decisive factor in promoting safer sex practices, encouraging early diagnosis and treatment, and reducing stigma associated with STIs. Somehow, their attitude is influenced by their age. As they get older, with increased knowledge and awareness, they show better attitudes (Zin et al., 2019). Therefore, the hypothesis proposed as follows:

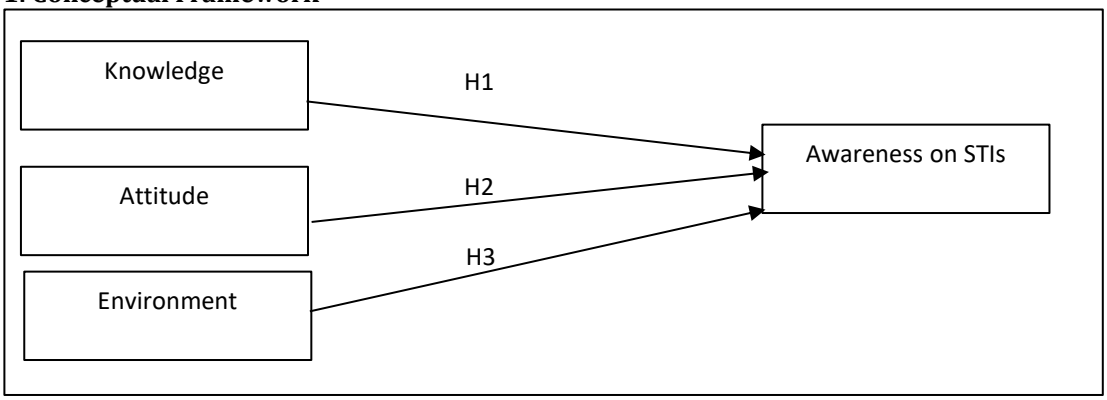
H2: There is a relationship between attitude and awareness towards STIs.

Environment towards Sexual Transmitted Infections (STIs)

The environment role refers to a person's surroundings, whether physically, mentally, or spiritually. Adeniyi et al (2014) stated that in the context of fresh undergraduates, 86% of the respondents agreed that exposure to a new environment was the reason behind their change in sexual relationships. For instance, the environment is the personality of people they meet, the setting or location of their workplace, the type of job

they are performing, and others. Meanwhile, studies have also been conducted in low-income neighborhoods where 32.1% of the respondents had one or more STIs (Boyer et al., 2018). Living conditions could also be classified as environmental factors that lead to STI. Therefore, the hypothesis proposed as follows:
H3: There is a relationship between environment and awareness of STI

Figure 1: Conceptual Framework



3. Research Methodology

A survey was conducted on a large population of 2167 young people, including categories of young people from a local university who applied cluster sampling to identify the sample from five programs: Event Management, Insurance, Finance, Retail Management, and International Business. Next, the researcher will choose a random sample of the cluster, incorporating all members of the chosen clusters into the sample. This type of sampling is often used when it is difficult or expensive to contact individuals directly, and it can also reduce the amount of time and money required to collect data from 227 samples. An online survey with a link was shared with the respondents, and the data collected was further analyzed using regression analysis to identify the most significant influence of the three factors mentioned above on STI awareness.

Most respondents are female, representing 65.2% of the total, while males comprise 34.8%. This gender distribution indicates a higher representation of females in the sample. Table 1 presents the results for the demographic factors. Next, the age distribution shows that a significant proportion of respondents fall within the age range of 22-24 years old, representing 77.1% of the total. Those aged 19-21 constitute 19.4%, and those aged 25 and above make up 3.5%. This suggests a concentration of respondents in the early to mid-20s age group. In addition, there are five programs, and the result indicates that the highest number of respondents from the program Finance is 25.1%, followed by International Business, with 23.3% having the highest representation. They continued with the insurance program with 23.3% of respondents, and the other courses were event management with 14.1% and retail management with 13.2%, contributing to the overall diversity in the sample. The majority of the respondents in Semester 5 represented a percentage of 64.3%, indicating a concentration of participants in the final year of their academic program. Semester 3 also has a significant representation with 19.8%, while Semesters 1,2 and 4 had comparatively lower percentages with 3.1%, 3.1%, and 9.7%, respectively.

Furthermore, the marital status shows that respondents are single, accounting for 97.8%, while married respondents constitute only 2.2%. Finally, 69.6% of the respondents reside within the college, while 30.4% are non-residents. Non-residents are further categorized into Family with 11.5% and friends with 18.9% in their living arrangement as NR.

Table 1: Demographic Factors

Demographic Factors		Frequency, n	Percentage, %
Gender	Male	79	34.8
	Female	148	65.2
	Total	227	100
Age	19-21	44	19.4
	22-24	175	77.1
	25 above	8	3.5
	Total	227	100
Program	BA236 - Event Management	32	14.1
	BA241 - Insurance	55	24.2
	BA242 - Finance	57	25.1
	BA245 - Retail Management	30	13.2
	BA246 - International Business	53	23.3
	Total	227	100
Semester	Semester 1	7	3.1
	Semester 2	7	3.1
	Semester 3	45	19.8
	Semester 4	22	9.7
	Semester 5	146	64.3
	Total	227	100
Marital Status	Single	222	97.8
	Married	5	2.2
	Total	227	100
Current Residency	Resident (Staying in college)	158	69.6
	Non-Resident (NR)	69	30.4
	Total	227	100

4. Results and Discussion

Descriptive Analysis

The analysis aims to explore the understanding of STIs among young people by categorizing the list of diseases to the group of STIs. The result shows the frequency and percentage of the disease as in Table 2. The most common type of STI that young people acknowledged is HIV/AIDS, which was selected by 204 young people, representing an 89.9% response rate. However, the question that received the most minor responses from the young people was tuberculosis. Only 14 young people agreed that tuberculosis is classified as an STI, which is a percentage of 6.2%. Next, the second biggest total of young people who answered is Syphilis, with 119 young people agreeing that Syphilis is one of the types of STIs with a percentage of 52.4%. The third highest number of young people who answered is Gonorrhoea, with 98 young people responding at a rate of 43.2%.

Table 2: Knowledge of Categories of STIS

Categories	Frequency		Percentage	
	No	Yes	No	Yes
HIV/AIDS	23	204	10.1	89.9
HPV	142	85	62.6	37.4
Chlamydia	148	79	65.2	34.8
Syphilis	108	119	47.6	52.4
Gonorrhea	129	98	56.8	43.2
Genital Herpes	144	83	63.4	36.6
Trichomoniasis	181	46	79.7	20.3
Tuberculosis	213	14	93.8	6.2
Hepatitis B	172	55	75.8	24.2
Hepatitis C	197	30	86.8	13.2

The following analysis, a descriptive analysis, was conducted to categorize the symptoms of STIs, as shown in Table 3. There were 7 common symptoms of STIs listed. as painful urination, with 159 young people agreeing that it is one of the symptoms percentage of 70%. In contrast, genital warts received the least number of answers, with only 43 young people, accounting for a mere 18.9% of the total. Next, the second highest chosen answer is genital rash, where 122 young people agreed with a percentage of 53.7%, followed by the third highest answer, which is unusual genital discharge, with 117 young people who answered with a percentage of 51.5%.

Table 3: Symptoms of STIs

Symptoms	Frequency		Percentage	
	No	Yes	No	Yes
Unusual Genital Discharge	110	117	48.5	51.5
Painful Urination	68	159	30	70
Genital or Anal Growths	161	66	70.9	29.1
Genital Rash	105	122	46.3	53.7
Abnormal Vaginal Bleeding	117	110	51.5	48.5
Genital or Anal Itching	127	100	55.9	44.1
Genital or Anal Blisters/Sores	144	83	63.4	36.6
Genital Warts	184	43	81.1	18.9

Next is the descriptive analysis of the activities that can lead to STIs, as shown in Table 4. 3 activities led to STIs being identified. The highest option being answered is having sexual contact with many partners, with 207 young people agreeing that it is one of the activities that lead to STIs, with a percentage of 91.2%. In contrast, taking drugs and alcohol received the least number of answers, with only 74 young people accounting for a mere 32.6% of the total. Next, the second highest chosen answer is unprotected sexual intercourse, where 198 young people agree with the percentage of 87.2%.

Table 4: Activities lead to STIs

Activities	Frequency		Percentage, %	
	No	Yes	No	Yes
Unprotected sexual intercourse	29	198	12.8	87.2
Having sexual contact with many partners	20	207	8.8	91.2
Taking drugs and alcohol	153	74	67.4	32.6

Reliability Analysis

The reliability analysis was conducted to analyze the internal consistency of the constructs that were aligned with the intent to measure. The assumption underlying reliability as the Cronbach alpha values greater than 0.708 indicates that the construct has high internal consistency. For Table 5, the result shows that the reliability analysis of knowledge with 8 items was 0.902, attitude with 6 items was 0.844, environment with 6 items was 0.836, and awareness with 4 items was 0.736. The result concluded that all constructs were highly reliable, as shown in Table 5.

Table 5: Reliability Analysis

Constructs	No of Item	Cronbach Alphas Values	Results
Knowledge	8	0.902	High
Attitude	6	0.844	High
Environment	6	0.836	High
Awareness	4	0.736	High

Pearson Correlation

A Pearson correlation was conducted to investigate the relationship of knowledge, attitude, and environment towards awareness. In the Pearson correlation, there could only be a positive relationship between the IV and DV by +1.0, and vice versa; there could be a negative correlation between the two variables by -1.0. By taking the number of respondents of 227. Furthermore, the correlation strength relations are based on Hair et al. (2010). The findings can be seen in the table above. Shows a positive high correlation (r = 0.621) between knowledge and young people's level of awareness. According to the r, knowledge shows that the higher the knowledge of sexually transmitted infection, the higher the awareness of young people. Additionally, the relationship is significant at the 0.000 level compared to the 0.05 significance level. In addition, the attitude had a value of r = 0.636, which indicates a positively high correlation. It shows that attitude had a significant influence on awareness regarding sexually transmitted infections among young people. Furthermore, the variable also shows a significant relationship at 0.000. Finally, the relationship between environment and awareness shows a positive high relationship (r = 0.672). In other words, the environment highly affects young people's awareness of the sexually transmitted infection issue. In correspondence to that, the significance value of the variable also shows a significant relationship at the 0.000 level.

Table 6: Pearson Analysis

Variables	Coefficient Value	Result
Knowledge -> Awareness	0.621*	High, Positive, Significance
Attitude -> Awareness	0.636*	High, Positive, Significance
Environment -> Awareness	0.672*	High, Positive, Significance

Regression Analysis

A regression analysis was conducted to analyze the three factors of knowledge, attitude, and environment influencing awareness of STIs among young people. The R square value was 0.557, which indicates that 55.7 percent of the awareness of STIs is explained by knowledge, attitude, and environment, and the balance of 43.7% may be explained by other factors that were not included in this study. For example, in an article by Kassie et al. (2020), prevention can be included as one of the factors affecting the awareness of STI among Preparatory School Young people in West Gojjam Zone, Ethiopia. The ANOVA result shows the F Value was 95.639, and the significance value was less than 0.05, indicating that the model is fit for regression analysis. In the coefficient table, the result of knowledge (β= 0.239, $p<0.05$), attitude (β= 0.294, $p<0.05$), and environment (β= 0.339, $p<0.05$) indicates that all variables had positive and moderate relationships on awareness of STIs. In addition, all variables were significant, as the p-value was less than 0.05. The interesting result, as shown in Table 7, found that the environment had the most influence on awareness of STIs among young people.

Table 7: Path Coefficient Analysis

Variable		B	Std. Error	BetaT	Sig
1	(Constant)	2.486	0.816	3.037	0.003
2	Knowledge	0.104	0.026	0.2393.995	0.000
3	Attitude	0.201	0.040	0.2944.993	0.000
4	Environment	0.226	0.042	0.3395.389	0.000

Discussion

The study aims to measure the knowledge, attitudes, and environmental factors that influence awareness of STIs among young people in UiTM Puncak Alam. The incidence of STIs has witnessed an increase in recent times. There is a need for the public to be aware of the various types of STIs so that individuals can take the necessary precautions to prevent infection and thereby reduce their prevalence. However, the focus of this study has not been on the prevention of STIs but rather on finding out whether young people are aware of the issue and whether they know the factors that can cause STIs. This issue has become more widespread these days due to a lack of information about the root of the problem. As a consequence of this, previous research has indicated that young people possess a limited level of information and awareness regarding prevalent STIs, including their associated symptoms and consequences Zhang et al., (2013). This finding indicates that

individuals in younger generations face a higher risk of STIs, which can result in severe health complications if not adequately treated, and may not consistently adopt suitable measures to safeguard their sexual well-being.

A descriptive analysis was tested to measure the level of knowledge and understanding of STIS among young people, and the result found that the knowledge possessed by young people was essential and that they were aware of STIS. However, the regression analysis was conducted, and it was found that knowledge, attitude, and environment significantly influence awareness. According to Folasayo and others (2017), the percentage of awareness of HIV/AIDS is the highest among young people regarding STIs, followed by Syphilis. This shows that the findings for these research objectives have been consistent with the literature review. Both HIV/AIDS and syphilis have the biggest number of responses from young people, according to this research study, which captures the same information Furthermore, the attitude has similar findings. This can be agreed by the findings of a prior study that revealed satisfactory levels of awareness and knowledge about STIs, along with a positive attitude towards those infected (Chaudhry, 2017). For the environment, this study supported (Boyer et al., 2018) that the environmental factor towards STIs (IV3) is reliable and valid, just as supported in the study regarding STIs conducted in an urban, low-income neighborhood.

5. Implication of Study

This study aims to research what are the factors that contribute to the levels of awareness among young people regarding sexually transmitted infections (STIs). This is because since STIs are a growing health issue among youths and people throughout the country, thus it aims to identify the prevalence and risk factors, which are knowledge, attitude as well and the environment that contribute to STIs, in proving what the level of awareness of STIs among the young people. Since young people in college are an appropriate or sizable population to conduct the study, it is essential to understand the factors that have been mentioned beforehand related to STIs. The purpose of the study is to validate the findings from previous research regarding STIs among our population and sample. Ultimately, this finding will benefit those young people to determine their levels of awareness towards STIs. Besides that, this awareness of STIs helps them develop those factors that contribute to STIs to increase their awareness. Aside from benefiting young people, this research can also give significance to health organizations and ministries as a benchmark to know the young people's awareness level. With the information obtained, the health ministry can plan any programs and initiatives to help increase young people's awareness regarding this issue. Furthermore, Not only the health ministry, the non-government organization that aims to help reduce the number of STIs and the stigma in Malaysia could also benefit from these studies.

Conclusion

In conclusion, based on our research objective, which is to determine the relationship between knowledge, attitudes, environment, and awareness among young people towards the spread of Sexually Transmitted Infections (STIs). This research shows that young people demonstrate a basic understanding of STIs even though the young people have gaps in specific knowledge and the factors that cause them. Their empathy towards infected people and worry about STIs show that knowing more might lead to caring more. Furthermore, the researcher gives some recommendations to young people in business and management to prevent STIs through continuous educational campaigns through sessions, workshops, and social media. Regular testing for sexually active individuals, alongside promoting PrEP for HIV prevention, should be actively encouraged. Hence, it is also crucial to collaborate with NGOs and government agencies to increase resources and information. In the end, helping young adults learn about STIs, choose responsible sexual behavior, and have healthy attitudes takes constant effort, but it's the key to a healthier future for everyone.

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Mindful Transportation: A Conceptual Framework for Enhancing Accessibility for People with Disabilities in Malaysia

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Abstract: This conceptual paper explores the integration of mindfulness principles into the development of transportation services for people with disabilities (PWDs) in Malaysia. Transportation plays a critical role in promoting inclusivity and enhancing the quality of life for PWDs, yet accessibility remains a significant challenge due to infrastructural barriers, lack of awareness, and limited empathy from service providers. Drawing on the concepts of mindfulness, which are rooted in awareness, empathy, and responsiveness, this paper proposes a framework that emphasizes inclusivity, respect, and collaboration among key stakeholders. The proposed framework emphasizes the need for a holistic approach that incorporates physical accessibility, staff training, and policy reforms. Inclusivity involves modifying infrastructure to meet universal design standards, while empathy requires transport providers to understand the unique challenges faced by PWDs and offer compassionate, tailored services. Responsiveness, a key element of mindfulness, calls for flexible and adaptive transport services that cater to the real-time needs of PWDs, ensuring that they can access public transportation with ease and dignity. By applying this mindful approach, the transportation system can become more accommodating and respectful toward PWDs, thereby reducing social exclusion and improving their mobility. This paper contributes to the growing body of literature on disability inclusion and provides actionable strategies for policymakers, transport providers, and disability organizations to work together in creating a more accessible public transportation system. Future research should investigate the practical application of this framework and its potential to drive policy changes that benefit PWDs across Malaysia.

Keywords: *Persons with Disabilities (PWDs), Mindfulness, Inclusivity, Responsiveness, Empathy, Respect, Mindful Transportation Services.*

1. Introduction and Background

Mindful public transport services focus on the well-being and comfort of passengers, communities, and the environments they serve. This type of service aims to provide a positive and inclusive experience for all while reducing the environmental impact. The importance of creating enabling, safe, and sustainable cities is underscored by the Global Goals and the 2030 Agenda for Sustainable Development. They stress the need to ensure that all citizens have access to environmentally friendly public transport, especially by improving public transport and paying special attention to the needs of the most vulnerable, including those with disabilities. (The Global Gate, 2019). Lönnqvist (2017) commented that people with disabilities are often at increased risk of poverty and that this risk is usually associated with poor health, poor academic performance, and low personal income. The World Health Organization (2019) found that all of this is caused by a lack of accessible resources for people with disabilities and the range of problems they encounter in their daily lives. Everyday challenges can include various obstacles, such as problems using public transportation.

Disability is a lack of ability or a state that makes it challenging for an individual to act in ways that are commonly accepted in a normal society. This phrase is typically used to describe a person's special talents, including physical, sensory, cognitive, intellectual, or mental health restrictions. This application is associated with a medical model of disability (Marks, 1997). This disability may develop at birth or later in life. People with disabilities (PWDs), or more contentiously, people who are disabled or retarded. Sometimes, the term "special people" is used. Even though PWDs are so prevalent and constantly brought up in conversation by Malaysians, the majority of the citizens are not concerned about this issue. Usually, Malaysians rarely help this group. Likewise, not many people know that because of discrimination against people with disabilities. The government has enacted laws that privilege this group.

Fundamentally, public transportation is a more environmentally friendly and convenient means of transportation than driving. However, people frequently choose to drive alone rather than take advantage of the benefits of traveling with others. Perhaps, these additional arguments could persuade people to stop driving if environmental concerns are not sufficient to do so. For instance, when not focused on driving, people can be more aware of their surroundings. While surrounded by a swarm of people, the time spent reflecting while using public transportation may help people think more broadly and perceive the world objectively. This permits people to be more mindful of the environment. In addition, public transportation allows people to be socially active. Conceivably, this is one of the reasons people often choose to drive alone because they want to avoid chit-chatting with strangers in public settings due to an unjustified fear of coming out as foolish or unintelligent. Thus, being social beings, we tend to value other people's company. The ability to socialize with other passengers is greatly enhanced by using public transit. It would increase our attentiveness by conversing with a new person and finally, a great method to start the day with mindfulness is to do breathing exercises while traveling by bus, train, or subway. After a long day at work, deep breathing can also be a very effective way for the body to unwind.

The above-mentioned benefits, however, are unquestionably accessible to normal transit passengers. But would those who are classified as people with disabilities (PWDs) experience the same way? What is more, sometimes the process of getting on public transportation itself is so troublesome and complicated for them. Accessibility is an essential aspect of the survival of disabled people. This is because the emphasis on accessibility can reduce all accessibility problems, especially in enjoying services in public transport. Furthermore, transportation is a crucial policy concern for people with disabilities. The PWDs have frequently stated how significant negative effects that transportation barriers have on their life. Stjernborg (2019) signified the most prevalent difficulty experienced by PWDs when using public transportation, particularly was entering or exiting the vehicles. Stjernborg also observed certain drivers' abusive or hostile behavior. Additionally, Stjernborg also emphasized the differences in individual capacities and pre-existing societal barriers as crucial elements influencing the experiences of public transportation passengers, particularly for those who are PWDs.

Public transportation plays a significant part in society by ensuring access to jobs, education, everyday activities, and socializing, as well as by allowing people to travel further than only from point X to point Y. In general, an individual's mobility is influenced by the context in which they interact. Concomitantly, physical restrictions and environmental barriers can limit a person's ability to move, which can ultimately result in isolation and exclusion (Bianquin & Bulgarelli, 2017) and prohibit PWDs from participating in society. According to Velho, Holloway, Symonds, and Balmer (2016) as well as Jansuwan, Christensen and Chen (2013), public transportation is crucial for those with disabilities, at least if they want to move beyond point X to point Y. As a result, the concept of mobility carries a lot of weight and significance. It also takes into account things like the nature, purpose, and ramifications of movement (Stjernborg, 2019).

Avoidance of using public transport may increase the danger of marginalization and exclusion for many already vulnerable populations, namely PWDs according to Lubitow & Rainer & Bassett (2017). They conclude that any kind of obstacle may always have this consequence. Therefore, fully supporting the inclusion of individuals with disabilities in the transport system is important, i.e. examining how transport contributes to exclusion and marginalization. Offering transportation services is important. The extent to which users can use the service is also important. The diverse needs of each individual, including those with disabilities, must be taken into account by transport and facility providers. Meanwhile, Malaysians living in big cities, especially people with mobility disabilities, also suffer from the same problem. They are aware of the traffic restrictions faced in major cities, especially in the Klang Valley. Lack of parking and accessible transportation are also issues that need to be addressed. Concerns about the hazards posed by the space between platforms and train doors, and the lack of safety measures to address the risks associated with the use of escalators and stairs in transport hubs. Physical barriers cause some travelers to sacrifice safety to complete their trip. Some people take even longer because they are more aware of the dangers of the obstacles. The time required also depends on their ability to overcome obstacles along the way.

Humans have different needs based on their unique biological, psychological, and environmental aspects. One of the negative effects of the psycho-emotional aspect of the disorder is irritability and loss of security. Indeed,

both the structural deficiencies and the mental-emotional dimensions of disability point to injustice in the form of poor or inadequate environments that result in social exclusion (Harley, 2020). In addition, there are unfavorable prospects for the public and service providers. Negative attitudes, such as stigma and prejudice, are driven by a general lack of awareness of people with disabilities and underscore that the majority of people are aware of their civic obligations. People who need mobility but have limited mobility can get help from a few people. Conversely, the lack of attention to transportation services reflects the provider's negative attitude. Despite their best efforts, they fail to fully consider the views of people with disabilities when making decisions (Kamaruddin, 2022).

Regardless of the type of barrier that occurs in the public transport system, it means avoiding traveling by public transport which can increase the risk of marginalization and exclusion to the often-vulnerable group that is PWDs. Thus, this study's goals are to examine how people with disabilities (PWDs) experience utilizing public transportation and what measures the service provider of that transportation employs to help them. Lastly, to look at how these measures affect PwD's travel experience and what it takes for disabled passengers to be treated equally by the public transportation system. Eventually, one of the three main concern issues involved in enforcing the rights of people with disabilities is the hardships that both adults and children with disabilities face daily, many of which have only slightly improved over many years. Officially, the Department of Social Welfare, Ministry of Women, Family and Community Development, Government of Malaysia has identified seven categories of disabilities in Malaysia namely, Blindness, Deafness, Speech Disability, Physical Disability, Learning Disability (especially children with Autism), Mental Disability and Others (Amar-Singh et al., 2021). The next paragraphs describe the elements that will influence PwDs' experiences in using public transportation in their everyday life.

This study is expected to suggest a relevant model for PWDs that can be useful in improving and constructing a transport providers' mindful service for PWD as well as addressing PWDs' access and mobility needs, to produce a safe, affordable, accessible, and sustainable transportation system for PWD and to reduce barriers and challenges faced by the public transport services in establishing sustainable transportation systems. This research provides good material as guidelines and references to public transport providers and the government especially to Social Welfare Department (PWD Development Department).

2. Literature Review

Persons With Disabilities (PWDS) In Malaysia

People with disabilities (PWDs) in Malaysia are regarded as the most vulnerable minority group in Malaysia. According to the Disabled Persons Act 2008, PWDs include those with long-term physical, mental, intellectual, or sensory deficiencies that when interacting with various obstacles, may restrict their full and effective participation in the community. Currently, the latest number of registered PWDs recorded by the Department of Social Welfare is 592,856 in Januari 2021 as compared to 549,554 in June 2019. The increasing number of people with disability every year influences the effort of every quarter of public and private agencies to provide relevant opportunities, access, and care for this disadvantaged group. The total number of people showed that disabled persons were able to have a significant impact on the community members. Realizing this fact, Malaysia is committed to the Convention on the Rights of Persons with Disabilities (CPRD). It's useful as a guide to people, family, and friends who want to help disabled persons – in using their rights. It also states the actions that must be taken by the government to help all disabled persons realize their rights.

Mindfulness

The concept of mindfulness has been established by Langer (1999), which posits a situation where the cognitive integration of awareness and responsiveness occurs at the individual level. The concept, however, expanded as in the work of Weick, Suitcliffe, and Obstfeld (1999) to an organizational level that draws on high-reliability organizations (e.g. power plants and aircraft carriers). Weick et al (1999) argue that these highly reliable organizations are very vulnerable and small errors may even be detrimental. Consequently, relying on trial-and-error learning or adhering to established routines is inadequate. In contrast to a state of mindlessness, mindfulness is characterized by "a continuous examination of existing expectations, ongoing refinement and differentiation of those expectations in light of new experiences, and a readiness and ability to develop new expectations that can meaningfully address novel situations" (Weick & Sutcliffe, 2001). Mindlessness, on the

other hand, is how preoccupation with perspective was built on an 'automatic pilot' to handle certain unprecedented events without realizing that things could be otherwise. (Weick et al, 1999). They also point out that the state of mindfulness is maintained by five cognitive aspects (1) preoccupation with failure, (2) reluctance to simplify interpretations, (3) sensitivity to operations, (4) commitment to resilience, and (5) under specification of structures/ deference to expertise. Mindfulness is commonly defined as the flexible allocation of attention to present experiences. Despite variations in the conceptualization of mindfulness, there is a general consensus among scholars and practitioners that it fundamentally entails a focus on the present moment (Bishop et al., 2004).

According to Langer's perspective, mindfulness is about actively noticing new things and being open to different perspectives, rather than being on autopilot or operating on preconceived notions. In the context of public transportation, this might involve actively observing the environment, the people, and the interactions around, it rather than being lost in one's thoughts or routine. For people with disabilities, the mindfulness shown by other people around them is ultimately important. At the same time, transport providers namely the terminal services and transport service providers should pay attention to the needs of this special group of passengers.

Inclusivity

Many academics have defined inclusion, notably in the field of education. The definition of inclusion depends on the individual and is not limited to any one study. Vobruba (2000) believes that the main focus of empirical study should be on people's interpretations and subsequent behaviors. However, a lot of research on inclusion focuses on social, political, and economic issues. (Good Gingrich, 2008; Richmond & Saloojee, 2005). On another perspective, Göransson & Nilholm (2014) for instance, in their studies have classified it into four different categories known as placement definition, specified individualized definition, general individualized definition, and community definition. According to them, placement definition can be described as inclusion as placement of students with disabilities or in need of special support in general education classroom, meanwhile, inclusion as meeting the social and academic needs of students with disabilities is referred to the definition of specified individualized. Specified individualized refers to inclusion as meeting the social and academic needs of students with disabilities and the fourth definition of inclusion in the perspective of community refers to inclusion as the creation of communities with specific characteristics. Among the definitions given, the last definition is used for this study as it covers the community perspective.

Social inclusion as described by Kenyon et al. (2003) is a dynamic state about a process in which an individual or group can engage in mainstream society because of good accessibility and mobility. The concept of social inclusion is concerned with providing opportunities for all individuals to participate in an equitable and impartial transportation system (Cook et al. 2017). Social inclusion also depends on the opportunities to use a transportation system and how convenient it is for a person to get to work daily or for other social activities. (Lättman et al. 2016). Therefore, Farrington and Farrington (2005) in their study mentioned the requirement to provide greater mobility and accessibility to ensure social inclusion. According to Tahmasbia, B., & Hossein, H. (2019), accessibility is defined as the simplicity with which a traveler can use a certain mode of transportation to reach any location where an activity is taking place.

In this era of modernization, the quality of life has dramatically improved in various aspects including the transportation sector. To cope with the environmental change and the mobility needs among the public and businesses, fostering an inclusive public transport system is essential. Nevertheless, Lucas (2004) is his study that highlighted the issue of inequality as modern mobility is not inclusive and many parties were affected in terms of accessibility problems to work, health care, leisure activities, and social services. Another researcher also identified the link between accessibility and social inclusion. Kenyon and Lyons (2003) and Currie and Stanley (2008) for instance believed that limited access to social opportunities influenced social exclusion in the UK and Australia respectively. Additionally, Kenyon (2011) stated that the cause of social exclusion is to lack of accessibility to social networks and opportunities in society. Another study by Stanley et al. (2010) also indicated the positive links between public transport usage and social inclusion. They believed that public transport serves as a means of assisting people to be included.

Numerous industries were impacted by the worldwide pandemic COVID-19 and were forced to cease

operations. However, the operation of public transportation networks had to continue throughout the COVID-19 outbreak due to its significance as a necessary public service. (Shibayama, Sandholzer, Laa, & Brezina, 2021). However, PWDs and other disadvantaged and vulnerable groups encounter some limitations and difficulties as a result of the widespread presence of COVID-19. These difficulties are listed by Cochran (2020) and include: a) safe and dependable transportation; b) current information; and c) inadequate help from transportation service providers. Additionally, it poses a risk of introducing new transportation hurdles that would make traveling more hesitant (Cochran, 2020; Genitsaris, Nalmpantis, Amprasi, & Naniopoulos, 2021). Therefore, there has been a request for more research into resources to increase accessibility in all modes of transportation due to PWD's high risk of social exclusion generally, which has been heightened during the pandemic (Armitage & Nellums, 2020; Cochran, 2020; Genitsaris et al., 2021).

As a result, it is necessary to review service planning and infrastructure (Jenelius & Cebecauer, 2020; Mogaji, Adekunle, Aririguzoh, & Oginni, 2022), with a focus on the provision and performance of transportation services (Wang, Shen, Abu Ashour, & Dannenberg, 2022). The difficulties in providing public transportation for people with disabilities must be overcome by creative and cooperative methods (Mogaji et al., 2022; Vickerman, 2020; Wang et al., 2022).

Social exclusion exists in a society regardless of the geographical area. According to Litman (2003), everyone in society is seriously confronted with social exclusion in all circumstances. Nevertheless, certain individuals or groups are prone to the risk of being excluded due to the exclusionary factors. Physically and mentally disabled persons are among the identified persons. Currie and Delbosc, (2011) have also identified several groups as most likely to be at risk of social exclusion due to relatively poor mobility opportunities. One of the groups is people with a disability. Additionally, Dodson, Gleeson, and Sipe (2004) have also listed several individuals or groups of people as those parties who are at risk of social exclusion regarding various issues of transportation including disabled persons.

Responsiveness

Responsiveness is the willingness of employees to help customers and provide responsive services (Tjiptono, 2016). It is a service quality dimension related to service providers' willingness to assist customers and provide services quickly. This dimension's attributes include informing customers about the certainty of service delivery times, providing prompt service to customers, being willing to assist customers, and being ready to respond to customer requests (Setiono & Hidayat, 2022). Additionally, respondents agreed that responsiveness refers to providers implementing quickly and precisely their service, besides that the officers are always ready to respond to customer requests.

As with many other people, PWDs have the right to full access to all public services (Kadir & Jamaludin, 2012). In comparison to non-disabled persons, PWDs have a high level of immobility, which has significant implications for access to urban facilities, particularly employment and health and education services. Second, the movement contributes to discrimination and exclusion in significant ways. In addition to the problems faced by the general community, those with limited mobility confront additional obstacles when utilizing the transportation system. The primary demands of PWDs relate to the problem of articulation between public areas and the transportation system, both in terms of infrastructure and the attitude and conduct of service providers and other citizens (Pinto, et al., 2020).

Given the difficulties experienced by PWDs, particularly with public transportation, responsiveness is more than just solving customer problems; it is also the desire that arises within employees to assist with problems encountered by the company's customers, for the company to leave a positive impression on customers (Martha & Jordan, 2022). Responsiveness is crucial to comprehend and attend to potential customers' demands and desires in real-time and at a faster rate than competitors (Sharma et al., 2020). Therefore, as responsive public transport providers, they have moved their focus to the establishment of long-term customer connections (Sharma et al., 2020), trying to elicit consumers' pleasant feelings and so strengthen their behavioral intentions (Cheung et al., 2020). This study supports Kadir et al. (2018) assertion that people who manage a public space or public building can be viewed as important agents in providing an inclusive environment for users. It also coincides with public transport service providers.

Customer responsiveness, employee responsiveness, service responsiveness, and competitive responsiveness all contribute to overall responsiveness (Krush et al., 2015; Salvador et al., 2014). Customer responsiveness is defined as the capacity of retail firms to react to shifting market patterns and evolving customer expectations. (Phiri & Mcwabe, 2013; Qin and Prybutok, 2009). Employee responsiveness refers to the employees' preparedness and willingness to provide a prompt response to a customer's request and specific needs. According to the seminal work of Theoharakis et al. (2009), service responsiveness is defined as the rate at which a customer-focused service is delivered with a timely solution to the customer's problems. Competitive responsiveness is exemplified by retailers' ability to respond quickly and proactively to competitors' actions (Salvador et al., 2015).

Responsiveness and sensitivity need to become a culture in organizations, especially service providers. A study by Mahr, et al. (2013) found that cultural sensitivity and responsiveness entail far more than simply understanding a client's culture. True cultural responsiveness necessitates the application of knowledge practice. Nevertheless, it must be underlined that cultural sensitivity entails more than knowledge of ethnic groups. A responsive person will have a better understanding of the circumstances and needs of others. In providing services, the providers will attempt to be mindful, comprehend the situation of the PWDs, and enhance the quality of service. Multiple benefits accrue due to the responsiveness of the client and the principal providers to economic activities. These benefits include greater operational dependability, shorter processing times, increased turnaround speed, lower costs and lead times, greater efficiency, enhanced product innovation, and superior competitive advantages (Gunasekaran et al., 2008). Individual attention will boost customer contentment, as will employee attention to client concerns; when this occurs, there will be a fundamental shift in customer satisfaction.

A poor response will leave the service recipient with a negative impression. However, service providers must put consumer requirements first (Purwati, 2016). With a positive response, a positive relationship will be established between service providers and service recipients, resulting in the dissemination of patient satisfaction through word of mouth. The utilization of services by service recipients is determined by the service recipient's requirements and the acquired experience. Therefore, a negative experience leaves a negative impression, which discourages consumers from returning because they are disappointed and their expectations of service providers are not met (Purwostuti & Walyani, 2015).

It cannot be denied that understanding the service quality component is essential for a facility manager to precisely measure and prioritize what is genuinely relevant to the building users with specific demands and to attempt to meet the PWD's needs (Awang, et al., 2021). It is equally important for public transport service providers to understand and care about the needs of PWDs. Typically, a responsive person will have a better understanding of the circumstances and needs of others. In providing services, the providers need to be mindful, comprehend the situation of the PWDs, and enhance the quality of service. People can act mindfully and yet they frequently respond in a rote, mindless manner. Langer (1999) identified that people rely on past distinctions in much of their daily lives; they overly rely on structures of situations that are representative of the underlying meaning without making new distinctions. Even though most transport services in Malaysia struggle to provide suitable accommodations for PWDs, the necessity to meet their needs must be improved considering recent situations. Responsive behavior must be applied to all providers and other passengers to show mindfulness towards the needs of the PWDs (Harian Metro, 2022). Additionally, the average level of responsiveness and service quality perceived by customers among older patients during the COVID-19 pandemic is a requirement for supportive planning among them. In the meantime, based on the effects of responsiveness on service quality, educational programs are recommended to increase the responsiveness of healthcare providers (Yusefi, et al., 2022). Likewise with public transport service providers, where education and knowledge about the response to all groups of customers, including PWDs are very important to give them awareness and at the same time improve the existing services.

Empathy

Empathy is defined as both affective and cognitive reactions that correspond to another person's emotions in response to their emotional circumstances (Davis, 1983). While both cognitive and affective empathy involve understanding another person's feelings, cognitive empathy specifically refers to the ability to recognize and comprehend another person's mental state, whereas affective empathy entails sharing another person's emotional experience without undergoing direct emotional stimulation. Empathy thus encompasses the ability to understand and feel another person's emotions, which involves adopting their perspective and seeing a situation from their point of view. Empathy is commonly understood as the ability to place oneself in another person's circumstances. However, research indicates that different forms of empathy exist, with cognitive and emotional empathy being the two primary types (Healey & Grossman, 2018). Cognitive empathy, as described by Ratka (2018), involves understanding another person's perspective, often referred to as adopting an alternative viewpoint or "putting oneself in another's shoes." In contrast, affective empathy consists of sensations and emotional responses triggered by another person's emotions.

From the contemplative mindfulness perspective, there has been a significant amount of research on how mindfulness practice can foster an improvement in empathy. It was found that training attending to one's inner experience strengthens the prefrontal cortex, front cingulate cortex, and anterior insula, the same brain regions required to increase empathy (Fan et al., 2011 & Masten et al., 2011). Through its inherent qualities of nonreaction and non-judgment, mindfulness can also influence empathy. An individual can put their tough feelings aside and focus on the suffering of others (John et al., 2016 & Wellmark, 2012)). Increased mindfulness enhances the empathy of healthcare professionals (Dean et al., 2017 & Lamothe et al., 2016)). Therefore, staying in the present moment can assist in calming the mind and emotions, which makes it easier to provide treatment for anxious patients without getting emotional contagion (Beddoe et al., 2004). As a result, those who work in this field and practice mindfulness are better able to be conscious and, in the moment, which allows them to see and understand others' experiences from a sympathetic angle and encourages critical assessment (Birnie et al., 2010).

The interaction between employees and customers is addressed by empathy in service quality. According to Zeithaml et al. (2006), empathy involves employees of the company showing concern and giving each customer their unique attention. The customer feels exceptional as a result. Employees at the company should try to learn the names of their customers, their preferences, and their requirements to foster empathy, and they should take action to satisfy them (Iddrisu et al., 2015; Kalu, 2015). Hence, loyal customers who are acknowledged by staff and given courteous treatment feel unique in the transport company.

Public transportation accessibility is essential for increasing the mobility of all individuals with disabilities in daily activities including going grocery shopping, working, learning, getting medical care, attending social events, and participating in cultural, recreational, and sporting events. Unfortunately, public transportation has not always been designed and implemented in communities to meet the wide range of needs of individuals with disabilities. PWDs Act 2008 section 27(2) states that to ensure that people with disabilities have equal access to public transportation facilities, amenities, and services, the providers of those facilities, amenities, and services shall give appropriate consideration and take necessary measures to ensure that those facilities, amenities, and services are compliant with universal design to facilitate their use by people with disabilities. Empathy is important for creating and sustaining many kinds of social connections, as well as for encouraging prosocial behavior (Roberts et al., 2014). Individual empathy, contextual comprehension, and social responsibility are the three components of social empathy (Segal, 2011).

Sharma et al. (2021) found that both men and women have negative perceptions of those who are physically challenged. Both genders also showed empathy for those who were physically disabled. Thus, there was no gender difference in the views and empathy of young people towards people with physical limitations. Additionally, the two constructs—attitude and empathy—had a significant and positive relationship with one another. These results suggested that social stigma related to disability, especially physical disabilities, is necessary. Public perceptions of disability are molded by the medical concept of individual deficit, which ignores societal constraints that translate some kind of psychological or physical damage into the social experience of disability (Watson et al., 2019).

Respect

Many studies in social and organizational psychology fail to provide explicit information about the dimensions of respect. Darwall (1977) proposed two categories of respect: recognition respect and evaluation respect. Respect is demonstrated when persons are described as being treated with civility and dignity (Simon & Stürmer, 2003; 2005). Tyler and Blader (2000) on the other hand, stated that respect is respecting a person's distinctive contribution or valuing their thoughts and accomplishments. Respect in social psychology denotes full acknowledgment as a person, with the premise that respect offers information about our position, prestige, and a sense of acceptance by others in our group and community (De Cremer, 2002). Respect among groups indicates that a person is equal to others and may be characterized as social information regarding one's relational worth for the group as expressed by others by the way they treat the other (Simon, Lucken, & Stürmer, 2006). Respect recognizes that other individuals are significant. Respect is supposedly a complex construct (Sung, 2004). Respect is a challenging notion since it is context-dependent and fluctuates depending on the perspective of the assessor/respect's target. Various respect-related connotations can be found, for instance, in the preceding pages' definitions. In philosophy, the concept of respect is significantly influenced by Kant's (1964) work, which argues that respecting others is a duty, however, in social psychology, regard is viewed as an attitude. Respect is seen as a moral necessity in nursing and is shown mostly via behavior.

When dealing with people with disabilities, one should observe respect. This is because respect is a fundamental aspect of human interactions, and it is essential to treat people with disabilities with dignity and equality. Respecting people with disabilities entails treating them as individuals with equal rights, capabilities, and value (Kocman & Weber, 2019). It entails recognizing their abilities, strengths, and contributions rather than defining them solely by their disabilities. Respect also entails being patient and understanding of their particular needs and challenges, as well as not making assumptions about their abilities or preferences. People with disabilities are more likely to have positive self-esteem and self-worth, a sense of belonging and connectedness to their communities, and better health outcomes when they are treated with respect. Respect also encourages social integration and reduces stigma and discrimination, both of which are critical in creating a more inclusive and welcoming society for all. In conclusion, the relationship between respect and people with disabilities is critical for promoting their well-being and overall quality of life.

3. Research Methodology

The conceptual framework for mindful transportation services for PWDs is based on four interconnected elements: inclusivity, empathy, responsiveness, and respect. Each element addresses a specific challenge faced by PWDs in accessing public transport and offers a strategic approach for service providers to enhance their offerings.

Inclusivity: This involves designing transport systems that are universally accessible. It includes infrastructure modifications, such as ramps, tactile surfaces, and low-floor vehicles, to ensure that PWDs can easily access public transport services. The principle of inclusivity also calls for the active involvement of PWDs in the planning and design processes (Velho et al., 2016).

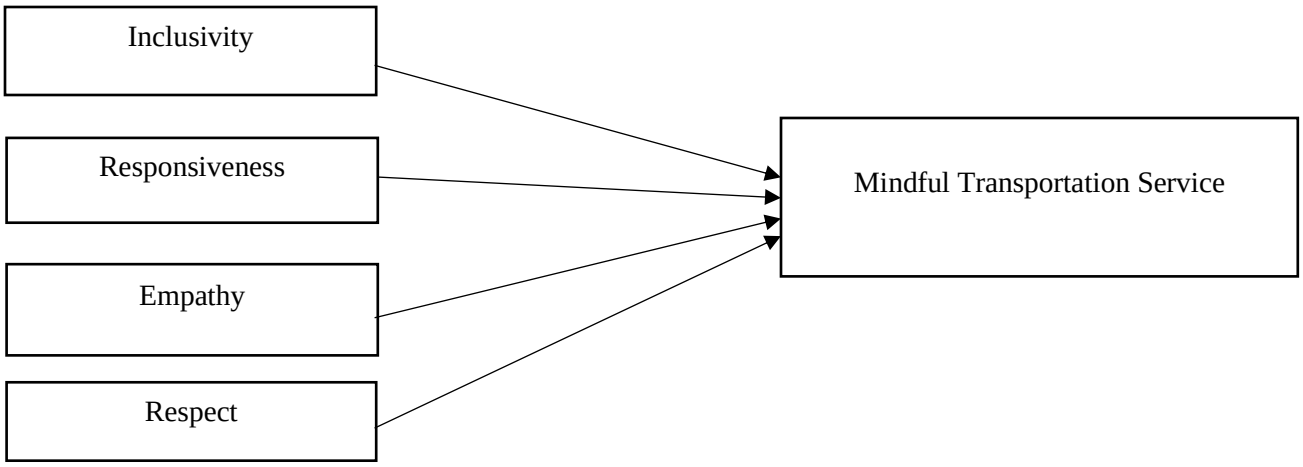
Empathy: Service providers must develop a deep understanding of the unique challenges that PWDs face. Empathy can be operationalized through staff training programs that teach service providers how to assist PWDs compassionately and effectively (Mogaji et al., 2022).

Responsiveness: A mindful transportation system must be flexible and responsive to the needs of its users. This includes real-time adjustments to services, such as accommodating last-minute requests for assistance from PWDs or ensuring that transport schedules account for the additional time required for PWDs to board and alight.

Respect: Respectful treatment of PWDs involves recognizing their rights and dignity. This includes ensuring that transport services not only comply with legal standards but also go beyond minimal requirements to create an environment where PWDs feel valued and respected.

By integrating these elements into transportation systems, providers can create a more equitable and supportive environment for PWDs. This framework can serve as a guide for future research and policy development aimed at improving the accessibility of public transport in Malaysia.

Figure 1: Proposed Framework



Independent Variables **Dependent Variable**

This conceptual paper adopts a theoretical framework informed by a comprehensive literature review to develop insights into mindful transportation services for people with disabilities (PWDs) in Malaysia. The methodology emphasizes synthesizing existing research rather than conducting empirical data collection. The literature review includes a systematic exploration of relevant studies related to mindfulness, inclusivity, and the experiences of PWDs in public transportation. By analyzing recent literature from various fields, including social psychology, urban studies, and disability advocacy, the paper identifies prevailing gaps and challenges within current transportation systems. This analysis aims to highlight how mindfulness principles—encompassing awareness, empathy, and responsiveness—can be effectively integrated into the design and delivery of transport services for PWDs. The conceptual framework developed in this study outlines the key components necessary for fostering an inclusive transportation environment. It emphasizes the need for collaboration among stakeholders, including government agencies, transport providers, and disability organizations, to address systemic barriers faced by PWDs. This framework is supported by case studies and examples from countries that have successfully implemented mindful transportation initiatives. By drawing on these models, the paper proposes actionable strategies that transport providers can adopt to enhance accessibility, responsiveness, and respect for PWDs. Ultimately, the goal of this methodology is to contribute to the discourse on disability inclusion in transportation and provide a foundation for future empirical research that can validate and refine the proposed framework.

4. Conclusion

This conceptual paper has articulated a framework for developing mindful transportation services that prioritize the needs of people with disabilities (PWDs) in Malaysia. By emphasizing key principles such as inclusivity, empathy, responsiveness, and respect, the proposed framework seeks to address the systemic barriers that PWDs face when accessing public transportation. Despite existing legislation and policies, the current transportation landscape often falls short of meeting the needs of PWDs, resulting in social exclusion and limited mobility. This paper highlights the necessity for a collaborative approach that brings together government agencies, transport providers, and disability organizations to foster an environment where PWDs can navigate public transportation with dignity and ease.

The insights gathered from the literature review underscore the importance of incorporating mindfulness principles into transportation planning and service delivery. By fostering a culture of awareness and understanding among transport staff and stakeholders, the transportation system can become more responsive to the unique challenges faced by PWDs. This framework not only contributes to the ongoing discourse on disability inclusion but also serves as a guiding model for future research and policy initiatives. Transport providers must implement strategies that enhance accessibility and ensure that PWDs are

recognized as integral members of society. Further empirical studies are needed to evaluate the practical application of this framework and to identify effective methods for overcoming barriers to accessibility in public transport systems.

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An Exploratory Study on the Effect of Macroeconomic Indicators on the Stock Market Performance among 6-ASEAN Countries

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Abstract: The stock market's performance has been impacted by the global economy's recovery from the COVID-19 pandemic. This study investigates the impact of various factors on stock market performance, with a focus on the global economic recovery from the COVID-19 pandemic. The stock market has experienced positive growth, driven by low interest rates, ample liquidity, and sustained investor optimism, despite concerns over rising inflation and interest rates. This research aims to analyze stock market performance across six ASEAN countries, using a range of data sources, including historical stock prices, financial reports, and macroeconomic indicators. The findings reveal that the real exchange rate exerts the most significant influence on stock market performance. The insights from this study provide valuable information for investors, policymakers, and government bodies, aiding in strategic decision-making and investment planning in these markets.

Keywords: *Stock Market Performance, Macroeconomic Indicators, Real Exchange Rate, Inflation Rate.*

1. Introduction

Scholars from all over the world have studied how stock market performance affects firm's investment in their respective countries. The stock market has a wide range of effects on businesses in an economy. There can be plenty of effects with daily movements across the Board. When gross domestic product (GDP hereafter) grows, businesses produce more and usually expand. The creation of liquidity by stock markets can have an impact on economic activity. Many profitable investments require a long-term commitment of capital, yet investorsare typically hesitant to hand over control of their savings for longer periods. This is because many profitable investments require a long-term commitment of capital. From the mid-1980s to the mid-1990s, global stock market capitalization increased by $10.5 trillion. The value traded for emerging markets increased as well, from less than 3 percentof the global total in 1985 to 17 percent of the global total in 1994. The global stock market capitalization increased by 33 percent between 2000 and 2009. According to the Organization for Economic Co-operation and Development (OECD hereafter) estimates, emerging markets will account for nearly 60 percent of global GDP by 2030. As a result, research on emerging marketswill become increasingly important in the future (Biedny, 2012). Recently, studies on howmacroeconomic indicators affect stock market performance have focused on various variableslike inflation, interest rates, and exchange rates, which remain crucial in shaping investor sentiment and stock market volatility.

Additionally in the year 2024, rising inflation, changes in interest rates, and geopolitical tensions are expected to play pivotal roles in determining stock market performance. The U.S. and global economies face persistent inflationary pressures, despite efforts to stabilize prices, and any deviation in central bank policy, such as interest rate cuts or increases, could significantlyimpact market performance. Key indicators like real GDP growth, consumer price index (CPI)inflation, and global trade policies remain influential factors in market movements. Thus, the slowdown in economic growth, coupled with geopolitical risks such as the Ukraine conflict, continues to affect investor confidence and stock market dynamics globally, Ullah, M., et al. (2023).

Various factors can have an impact on stock market performance. However, information asymmetry has emerged as the most serious issue, as it can negatively impact firm investmentdecisions. In general, Because of the proliferation of information made possible by the internet,there is now increased information transparency, which helps to address the issue of information inequality that exists among investors. There is a large body of research that supports the idea that investors might benefit from using a variety of data sources to determine

the worth of a company. These data sources include news stories, public announcements, and analyst reports (Chen & Wu, 2022). The terminology used in this study includes independent variables (IVs hereafter) such as exchange rate, interest rates, inflation rate, economic growth, and money supply, as well as stock market performance. Stock market performance is treated as a dependent variable in this study. This means that the changes in stock market performance influenced by how the other variables are react in current economic condition.

This study focuses on the causal relationship between macroeconomic indicators toward stock market performance in the selected 6 ASEAN Countries. The countries that have been chosen were Malaysia, Indonesia, Singapore, Thailand, the Philippines, and Myanmar. The reasons is these countries have experienced significant economic growth over the past few decades. These nations are key emerging markets, attracting substantial foreign investment due to their expanding economies and rising middle-class, Mehar (2022). Moreover, the ASEAN economies are highly sensitive to global economic shocks, including fluctuations in interest rates and exchange rates, making them valuable case studies for understanding how global macroeconomic changes can impact local stock markets (Deng, Lin, Guo, Pan, 2023). Not only that but other factors may be stated as issues that affect the stock market performance. The stock market has challenges with daily movements across the board, which can have many effects. Many market experts focus their attention on the S&P 500 Index as a measure of overall market health and, consequently, as one of the most important factors in market behavior.

The performance of the stock market is a topic that is almost addressed every day in the news. When it comes to the causal relationship between the performance of the stock market and the variables that affect the economy as a whole, the problem gets challenging. Every investment option will affect the performance of the stock market. Hence, it will be difficult to make such choices if there is a problem with the factors that influence stock market performance. But how does the relationship between the macroeconomic indicators and the performance of the stock market compare to that of other countries? The answer to this question will be connected to variables such as the exchange rate, interest rates, inflation rate, economic growth, and money supply, all of which will have an impact on the performance of the stock markets in six ASEAN countries.

2. Literature Review

Stock Market

To build publicly traded businesses Naik & Padhi (2012) stated that they must raise money from several investors. As a result, the stock market is regarded as a source of long-term funding. Additionally, it offers investors various investments to use their excess income into use. The study further, mentions that before investing money, investors should closely examine the performance of the stock market by keeping an eye on the composite market index. Verma and Bansal (2021) conducted a systematic review focusing on the impact of macroeconomic variables like GDP, inflation, interest rates, and foreign direct investment (FDI) on stock markets in both developed and emerging economies. They highlighted how variables like interest rates negatively affected stock performance, while GDP and FDI showed positive correlations.

The Relationship Between Exchange Rate and Stock Market Performance: Empirical data indicates a positive correlation between the exchange rate and the volatility of the US stock market. The works of Shapiro (1975) serve as examples of this. It is also shown that the market values and competitiveness of the firms are directly affected by the exchange rate. Both Agrawal et al (2010) and Aggarwal (1981) report a positive relationship between exchange rates and volatility in the stock market.

Over the course of the 1995–2001 period, researchers (Ramasamy & Yeung, 2002) identified the relationships between foreign exchange and stock markets as well as the implications those relationships have for capital controls in six different Asian countries, including Bangladesh, Japan, the Philippines, Vietnam, China, and Indonesia. In their analysis of six Asian markets (Bangladesh, Japan, Philippines, Vietnam, China, and Indonesia), they found inconsistent results for the bivariate causality between exchange rates and stock prices (T, 2021). The study also found a positive link between stock returns and currency values. Research by Adjasi and Biekpe (2006) indicates that stock price volatility in these six Asian economies is influenced by relative currency movements.

A study done by Bhargava and Konku (2023) investigates how fluctuations in exchange rates of major currencies affect the returns of the US stock market, specifically the S&P 500 index. Utilizing various statistical models, including GARCH, the authors found that Volatility in currencies like the Australian dollar, Canadian dollar, and euro significantly influences stock market returns. The article emphasizes the need for further research into howthese relationships may evolve during financial crises. Therefore, multiple studieshave found a positive correlation between exchange rate and stock market performance thus making it consistent with the theoretical findings as stated earlier in the research.

The Relationship Between Interest Rate and Stock Market Performance: Lee (1997) examined the relationship between the stock market and the interest rate on short-term loans using rolling regressions over three years. He used the difference between the returns on the stock market and the risk-free short-run interest rate to forecast the excess returns on the Standard and Poor's 500 index. Despite this, he discovered that the connection became unstable with time. Gradually, the link transforms from one that is strongly negative to one that is either non-existent or even positive, however weak.According to (Fama, 1981) predicted actual activity, which in turn is favorably related to stockmarket gains, is adversely correlated with expected inflation.

The connection between the yield spread and stock market returns was researched by Campbell & Shiller (1991). According to him, the same characteristics that are used to forecastlarger returns in the term structure also anticipate excess stock performance. As a result, he concludes that it would be beneficial to analyze the returns on bills, bonds, and stocks all at the same time. His research demonstrates that the structure term of interest rates isa trustworthy indicator of excess returns on the stock market, as his studies have shown. The relationship between these two is that interest rates could affect future earnings growth and it will lead to the performance of the stock market becoming downturn. For example, there will be lesseconomic growth when the government raises interest rates. Due to the higher returns offered by bonds, certificates of deposit, and other investments, equities may underperform when interest rates rise. Investors in stocks are less likely to drive up stock values when interest ratesrise because future earnings appear to be less valuable compared to bonds that currently providemore appealing returns says Rob Haworth, senior investment strategy director at U.S. Bank Wealth Management. Thus, the hypothesized relationship between interest rate and stock market performance is consistent with the theoretical findings.

A study done by Thorbeke (2023) about the connection between interest rates and stockmarket performance, especially in light of recent economic disruptions brought on by the COVID-19 outbreak looks into how stock market volatility was affected by U.S. monetary policy tightening, which involved raising interest rates, during the post-pandemic recovery. The results imply that, because tighter policies increased uncertainty, investors' views of policychanges had a major impact on stock market performance.

The Relationship Between Inflation Rate and Stock Market: According to the interview done by Limpanithiwat & Rungsombudpornkul (2010) for their research, there is a conventional opinion regarding the relationship of the inflation-stock price.From the interview responses, investors were classified into several groups, this includes investors who take inflation into account to maintain their purchasing power and investors whoslow down their investment when the inflation rate increases.

According to several studies that employ a broad range of methodologies, there is a very large positive relationship between indices of inflation rate and the performance of the stock market. This relationship has been found to exist. In general, economies that have financial systems that are more advanced Experience higher levels of real activity and faster rates of growth than economies that have financial systems that are less advanced. It is possible to observe this considerable and favorable association between measures of the progression of the inflation rate and the development of the stock market.

The cross-sectional relationship between inflation and the stock market using time-averaged data from a large number of nations over multiple decades has been used to study the relationship. In addition, Boyd, Levine & Smith (2001) research suggests that inflation and the growth of the banking sector and equity market activity have a substantial negative link. This is because there is a nonlinear relationship. The marginal effects on inflation rate and stockmarket growth rapidly decline as inflation rises. There is a noticeable decline in banking sectorperformance for nations with inflation rates higher than 15 percent. Lastly, the data shows thata higher

nominal equity return does not match higher inflation in low-inflation countries, in high-inflation economies nominal stock returns move almost exactly in line with marginal inflation increases. Therefore, the hypothesized relationship between inflation rate and stock market performance does not coincide with the theoretical findings as there is a negative relationshipbetween these two variables.

Ongoing studies continue to explore the dynamic relationship between inflation and stock market performance, utilizing various models and empirical approaches. For example, the study using the stock duration model examines how inflation and real interest rates influence stock prices over time. The model integrates factors such as growth rate sensitivity and equitymarket risk premiums, providing insights into how inflationary pressures affect the valuation of stocks, especially those listed in major indices like the DJIA and NASDAQ (Eldomiaty, Saeed, Hammam, & AboulSoud, 2020). Another latest study provides empirical evidence from sub-Saharan Africa, showing that financial markets, including stock exchanges, are vital for economic growth, particularly when combined with innovations in financial systems (Chikwira & Mohammed, 2023).

The Relationship Between Economic Growth and Stock Market: Singh & Weisse (1998) contest the idea that stock markets are likely to stifle economicgrowth because of their proneness to market collapse. They contend that for a variety of reasons, stock market improvements are unlikely to help emerging nations achieve faster industrialization and long-term economic growth in the 1980s and 1990s. First, the high degreeof cyclicality in share prices makes them ineffective as signals for resource allocation. Second, stock markets frequently encourage short-term gains rather than enabling company management to take a long-term approach to investing. Third, the dominance of stock marketsmay diminish the contribution that the banking sector makes to boosting the economies of developing nations, notably those in East and Southeast Asia.

According to Harris (1997) research on 49 nations spanning the years 1980 to 1991, there is no discernible link between the stock market and economic growth. He applies the two-stage least squares method, dividing the sample size into developed and less developed nations. According to empirical findings, the stock market in rich nations may have some explanatory power, but in emerging nations, there does not seem to be a strong correlation between the stock market and economic growth.

The arguments made by Harris (1997) and Singh (2012), however, opine otherwise. Singh (1998) concentrates his study on developing nations and aims to comprehend how stock markets contributed to long-term economic growth in the 1980s and 1990s. He concludesthat long-term economic growth in developing nations does not indicate a dependence on the stock market. The volatility and arbitrage process will result in insufficient investment allocation, which is one of the key causes of this scenario. Additionally, the way that the stockand currency markets respond to bad economic shocks will change how macroeconomic variables remain stable. Long-term economic growth would be hampered as a result. Thus, thehypothesized relationship between economic growth and stock market performance is against the theoretical findings.

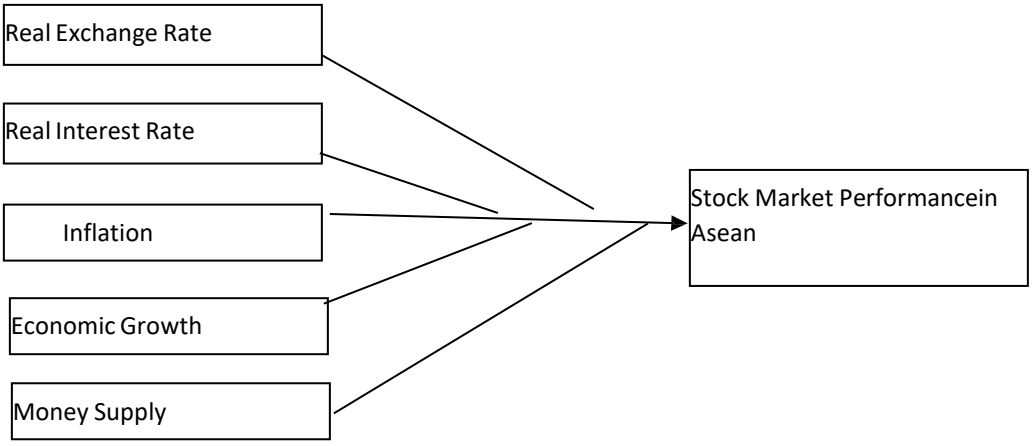
Recent research continues to explore the relationship between stock market development and economic growth across various regions. For instance, the latest study on Zimbabwe highlights how stock market liquidity has a positive association with economic growth, especially in volatile economies, though it doesn't always drive growth directly in every context. Policymakers are encouraged to focus on regulatory frameworks to enhance market liquidity for boosting economic activities, (Chikwira & Mohammed, 2023). Additionally, G20 countries have been analyzed, revealing that stock market development tends to spur growth when there are robust financial reforms. These studies underscore that while stock markets are critical to growth, the exact nature of the relationship can vary depending on regional contextsand the broader financial environment (Pradhan, 2018).

The Relationship Between Money Supply and Stock Market: The relationship between money supply and stock prices that might affect the stock market performance has been examined in many studies. The turning points in a stock price index werecompared to the turning points in the growth rate of money (Sprinkel, 1965). He concluded that a bear market in the stock market was likely to occur 15 months after eachpeak in monetary growth and that a bull market in the stock market was likely to occur two months after each monetary trough was reached.

The complex relationship between the amount of money in circulation and the performance ofthe stock market has been the subject of a great deal of empirical research. While some studieshave established a strong link between the money supply and stock prices, others have not (Ghazali & Yakob, 1998). The correlation between the money supply and the performance of the stock market can be influenced by several such as interest rates, inflation, economic growth, and consumer confidence. The connection can change over time and between differentnations. It can also be impacted by monetary policy choices and other macroeconomic issues. A monetarist viewpoint suggests that a rise in the amount of money leads to an increase in themoney supply, which in turn results in a surplus of money that can be used to buy stocks. Eventually, higher demand will result in higher stock prices (Fisher, 1911). Henceforth, the hypothesized relationship between money supply and stock market performance corresponds with the theoretical findings. According to Tobin's Q theory, people will start to spendwhen the MS grows. This situation will stimulate the demand for the stocks. When the demandfor stocks increases, the stock price (returns) would also increase, ceteris paribus, Jamaludin, Ismail & Ab Manaf, (2017).

Combining all factors, the following theoretical framework is being proposed.

Figure 1: The Theoretical Framework



3. Methodology

This study considered panel samples, where data was collected from 2010–2022. For the purpose of this study. The variables that will be considered in this study are Stock market performance as the dependent variable and independent variables are exchange rate, interest rate, inflation, economic growth, and money supply.

Model Specification

This research study makes use of time research since it is concerned with data that is related totime-series data. Consequently, it applies time to research. By developing the study with the help of time series, it is feasible to make predictions about future data while simultaneously eliminating outliers that would disclose the underlying signal if one were to use a particular software system that was connected to time series data. As a result, this line of inquiry can be categorized as a time series because we are compiling and making use of statistical and historical data for each variable that was collected during a variety of periods. The model specifications for this study are taken from Jamaludin, Ismail & Ab Manaf (2017) who look at the relationship between macroeconomic variables and stock market return. Therefore, the model specifications to see the impact of macroeconomic indicators on stock market performance are as follows:

$$Yit = \alpha 0 + \beta 1\ lNERt + \beta 2\ LNIRt + \beta 3\ LNGDPt + \beta 4\ LNM2t + \beta 4\ LNCPIt + \mu t$$

To analyze or quantify the relationship and magnitude of the impact between independent variables (real exchange rate, real interest rate, inflation rate, economic growth, and money supply) and dependent variables (stock market performance), the method of analysis appliedwas the regression approach. To analyze or quantify the relationship and magnitude of the impact between independent variables (exchange rate, interest

rate, inflation rate, economicgrowth, foreign direct investment, and money supply) and dependent variables (stock market performance) the method of analysis applied was the regression approach.

The points at which the criterion variables change as the predictor variable changes are represented by the regression coefficients (i=1, 2,..., n). There aren't many jargon that are useful for comprehending multiple regression. To assess the impact of the predictor factors on the criterion variables, these terms, like the beta value, are stated in terms of standard deviation. R evaluates how closely the values of the criterion variables predict and observe each other. The R square, often known as R2, which is the square of the measure of association, displays the extent of overlap between the predictor factors and the criterion variables. An estimated R2 estimate if you used this model on a different set of data. The multiple regression rule of thumb states that for the result to be more accurate, there must beat least two independent variables. In terms of sampling size, it is recommended that each independent variable in the data set analysis have at least 30 or, for security, 100 samples.

Data and Sources

For this study, most of the data come from the World Bank for all economic variables that we found including exchange rate, interest rate, inflation rate, foreign direct investment, economic growth, and money supply. The data we are using for this research spans 2010 through 2022. The details are shown below:

Table 1: Definition and sources of the variables

VARIABLES	PROXY	LITERATUREREVIEWMEASUREMENTUNIT		DATA SOURCES
Dependent Variable				
Stock Market Performance	**Stock Market Index:** KLCI JKSESGXPSEi VNINDEXYSX	(Satrugan Sinah,2017)	Annual percentage	World Bank
Independent Variable				
Real ExchangeRate	REER	(Bekti Setroyani,2020)	Annual percentage	World Bank
Real Interest Rate	REIR	(Ari Christianti,2020)	Annual percentage	World Bank
Inflation Rate	CPI	(Schwarzer, 2018)	Annual percentage	World Bank
Economic Growth	GDP	(Abraham, 2018)	Annual percentage	World Bank
Money Supply	M2	(Aulia Richman, 2019)	Annual percentage	World Bank

Diagnostic Test

In the process of modeling time series, one of the most typical steps is called diagnostic checking. This stage involves putting a calibrated model through a variety of statistical teststo check that the model accurately reflects the observed time series. The execution of this procedure allows for the identification of any potential problems that may emerge throughout the test. Several different approaches may be taken to guarantee that the entirety of the model is significant.

Variance Inflation Factor (VIF) Procedure

A variance inflation factor (VIF Procedure) is a metric that may be used in multiple regression models to assess the degree to which the model's independent variables indicate multicollinearity. Detecting multicollinearity is essential because, even though multicollinearity does not diminish the ability of the model to explain phenomena, it does lessen the statistical significance of the model's independent variables. A high VIF on an

independent variable shows that it has a strongly collinear relationship to the other variables, which is something that should be accounted for or taken into consideration while designingthe structure of the model and choosing which variables will be independent.

$$\mathbf{VIF} = \frac{1}{1 - R_i^2} \quad (1)$$

A rule of thumb when understanding the variance inflation factor is as follows:
1 = not correlated.
Between 1 and 5 = moderately correlated.
Greater than 5 = highly correlated. (O'Brien, 2007)

The VIF must be increased for the regression result to be decreased. As a result, the discussion centers on the minimum size of the VIF that must exist for there to be implications.Some publications suggest adopting more conservative criteria after you reach the range of and above, but a VIF that is greater than 10 indicates a significant correlation, which might be concerning (Potters, 2022).

Serial Correlation Test

It determines how a variable's historical values relate to its current value by measuring the connection between the two. If two variables are serially connected, it suggests that one of them is not completely random (Drukker, 2003). Technical analysts verify the lucrative patternsof an asset or group of securities and identify the risk associated with investing possibilities. Serial correlation, also known as the "Durbin-Watson Statistic," is the correlation that exists between a certain variable and a lagging version of itself over a variety of different periods. This correlation is referred to as "serial." Measuring the link between the two determinesthe degree to which the historical values of a variable are related to the value of the variable atpresent. If there is a serial correlation between a variable and other variables, then it is possible that the variable in question is not random.

$$DW = \frac{\sum_{t=2}^{T}(e_t - e_{t-1})^2}{\sum_{t=1}^{T} e_t^2}$$

In the Durbin-Watson test, the following hypotheses will be tested, King et al. (1995).
H0 = no first-order autocorrelation.
H1 = first-order correlation exists (for a first-order correlation, the lag is a one-time unit).

A test statistic, with a value ranging from 0 to 4, is provided by the Durbin-Watson test, whichreports:
2 is no autocorrelation.
0 to <2 is positive autocorrelation (common in time series data).
>2 to 4 is negative autocorrelation (less common in time series data).

These relationships are capable of existing in either a positive or negative state of serial correlation at any given time. When the serial correlation is positive, it indicates that there is adifference in value between the current price of a security and future prices and that this difference in value is likely to be equivalent to the fluctuation in the price value that occurred between the past and the present prices. When the serial correlation is negative, it indicates thatthere is no difference in value between the current price of a security and future prices. This occurrence takes place whenever there is a favorable connection between the two tiers of prices. On the other hand, negative serial correlation is a depiction of the value changes that will occur between current prices and future prices since it is more likely to move in the opposite direction than to move in the same direction as current prices (Banton, 2021).

4. Results and Discussion

Table 2 summarizes the results from the fitting model as described in the equation above. The results were discussed by referring to the E-views data collected. The results were obtained based onordinary least square multiple regression analysis by each country. The results indicated thatthe value of R2 is different between each selected country due to the characteristics of thedata. Only the Philippines shows the R2 value of 0.913 which means that 91.3 percent variation of stock market performance can be explained by total variation in selected explanatory variables, while the coefficient of R2 for Malaysia is 0.335 indicating that 33.5% variation of stock market performance can be explained by total variation in the selected explanatory variable. Additionally, the presented all models are free from the presence of autocorrelationas the value of Durbin Watson is above two indicated negative autocorrelation.

Table 2: Regression Result

Countries/ variables	Malaysia	Indonesia	Singapore	Philippines	Vietnam	Myanmar
LNER	1.968 (1.456)	0.038 (0.098)	5.016 (1.625)	4.618*** (11.054)	-3.387*** (4.605)	-0.328** (-2.706)
LNIR	0.741** (2.427)	0.180 (0.711)	-0.488 (-1.205)	-0.243 (-1.325)	-1.056*** (-3.635)	0.087 (0.526)
LNCPI	0.417 (1.310)	0.661* (1.885)	0.453* (1.873)	0.443* (1.813)	0.050 (0.3711)	-0.121 (-0.943)
LNGDP	-0.524 (-1.282)	-0.485 (-0.925)	-0.228 (-0.710)	-0.079 (-0.299)	-2.001*** (-2.641)	0.320 (0.882)
LNM2	-0.105 (-0.761)	0.4854 (1.056)	0.5854 (1.062)	0.072 (1.136)	0.561 (1.528)	0.165 (1.259)
C	-7.577 (-0.741)	1.903 (0.470)	-13.928 (-0.899)	12.676*** (5.765)	41.029*** (4.605)	-1.246 (-0.385)
R-squared	0.335	0.168	0.154	0.913	0.4905	0.444
D-Watson	2.266	1.680	2.580	0.690	2.957	2.547
F-Statistic	2.418	1.2706	1.144	46.60	6.017	3.835

t statistics in parentheses, p<0.10* p<0.05**, p<0.01***

To study the relationship between macroeconomic indicators and stock market performance, five hypotheses have been developed. As shown in Table 2, the hypothesis testing analysis of H1 indicated that the relationship between ER and stock market returns is positively and statistically significant only for the Philippines. Hence, for Vietnam and Myanmar, the result is negative and statistically significant. This result was quite similar to research conducted by Wongbangpo and Sharma (2002) who revealed that stock prices in Indonesia, Malaysia, and the Philippines were positively related to ER. Other studies in Pakistan by Gul and Khan (2013) and in Iran by Khodaparasti (2014) also found a positive significant relationship between ER and stock market returns.

The hypothesis testing analysis of H2 indicated that the relationship between stock market returns and interest rate is positively and statistically significant for Malaysia only meanwhile for Vietnam the relationship against and statistically significant. Therefore, the alternate hypothesis, H1 is accepted which shows that interest rate has a causal effect on stock market performance. The hypothesis testing analysis of H3 showed that there is a significant association between CPI and stock market returns in the 3 selected ASEAN countries which are Indonesia, Singapore, and the Philippines. The result revealed that there was a significant positive relationship between CPI as a proxy for inflation rate toward the stock market returns. Thus, the alternate hypothesis H3 is accepted. This finding was consistent with the previous studies.

The result showed that there is a negative and statistically insignificant association between GDP and stock market returns using KLCI indices in the 4 countries. Thus, the alternate hypothesis is rejected meaning that GDP does not have any influence on the stock returns. Differenceresults were shown in Vietnam and Myanmar.

Vietnam shows a negative and statistically significantassociation between GDP and stock market returns while Myanmar is insignificant.

The result revealed that there was a positive linkage between M2 and stock market returns. Therelationship between M2 and Islamic stock market returns was insignificant for all selected countries. Only Malaysia found a negative relationship and insignificant. This means that M2 does not have any influence on the stock returns. This is consistent with the previous study of apositive and statistically insignificant linkage between M2 and the stock index. For instance, Talla (2013) found that the stock market returns of the Stockholm Stock Exchange (OMXS30) werepositively related to the MS but failed to show a significant result.

5. Conclusion

In conclusion, based on our analysis of the six ASEAN countries, the variables that have the highest level of significance are the exchange rate and interest rate. Therefore, it is proven that exchange rate and interest rate have a strong relationship with stock market performance. It portrays that only these variables have a significant relationship with stock market performance in Malaysia, Indonesia, the Philippines, Vietnam, and Myanmar. The relationship above explains that if interest and exchange rates increase at a particular rate, stock market performance would be affected at the same time. However, Singapore does not have any positive relationship or correlation between the independent variables and its stock market performanceas we do not have enough evidence to reject all the null hypotheses. All of the variables show an insignificant relationship with the stock market performance of Singapore. The implications ofa research study refer to the practical and real-world consequences or outcomes that are likelyto result from the findings and conclusions of the study. In other words, the implications of a research study highlight what the results mean for different stakeholders and how they can be applied to improve the status quo.

The Central Bank plays a crucial role as a policymaker in regulating and influencing the financial markets. As the regulator of the monetary and financial systems, the Central Bank hasthe power to determine the interest rate, money supply, and overall stability of the economy. The stock performance research is significant to the Central Bank in the sense that it provides valuable information and insights on the current state of the financial markets, which can be used to make informed decisions that can impact the overall economic stability. One of the key aspects that the Central Bank examines when conducting stock performance research is the stock market index. The stock market index is an indicator of the performance of the overall stock market and is used to gauge the overall economic conditions. If the stock market index is rising, it is a sign that the economy is growing, and the Central Bank may consider raising interest rates to curb inflation. On the other hand, if the stock market index isfalling, the Central Bank may consider lowering interest rates to stimulate economic growth.

Another important factor that the Central Bank considers when conducting stock performanceresearch is the level of volatility in the stock market. High levels of volatility in the stock marketcan indicate that investors are becoming more risk-averse and that there is increased uncertainty.

In the financial markets. This can impact the Central Bank's decision-making processes, as it may consider implementing measures to stabilize the financial markets. The study's design or methodology flaws or other shortcomings are those that affected or influenced how the results of the research were interpreted. The following would be some of the study's limitations at the time the research was conducted. The focus of future research on the stock market performance can vary based on current trends,advancements, and emerging technologies. However, some general directions for future research in stock market performance include. It is important to note that these are just a few examples and the focus of future research on the stock market performance may vary based onthe specific needs of the financial industry.

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Adoption of Cashless Payment Among Undergraduate Students: A Case Study

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Abstract: The increasing acceptance of cashless payment systems has led to a significant transformation in the global financial transaction landscape in recent years. As technology evolves and consumer preferences shift, digital payment methods are gradually taking the place of traditional cash transactions. This change not only facilitates financial transactions for individuals and businesses but also has significant implications for convenience, security, and financial inclusion. This paper investigates the key factors driving the transition to cashless transactions during this period, along with the benefits and drawbacks associated with society's growing embrace of this innovative approach to managing finances. The primary focus of research in this area revolves around the adoption and use of digital or cashless payment methods. A quantitative methodology was employed, and a questionnaire was administered to 113 participants. The data were analyzed using the Statistical Package for Social Science (SPSS) Version 27. The findings indicated that Performance Expectancy (PE) and Perceived Technology Security (PT) played significant roles in the adoption of cashless payments among undergraduate students while Facilitating Condition (FC) and Social Influence (SI) did not significantly affect their adoption of such payment methods. This study provides valuable insights into assessing individuals' willingness, intentions, or actual behaviors regarding various electronic transaction forms, including mobile wallets, credit/debit cards, online payments, and contactless methods. Additionally, researchers can utilize these variables to explore the factors that influence users' acceptance or rejection of cashless payment systems.

Keywords: *Cashless Payment Systems, Digital Payment Systems, E-Wallet, Adoption of Cashless Payment.*

1. Introduction and Background

Malaysia's embrace of cashless applications is rooted in its extensive history of economic and technological advancement. The financial landscape in Malaysia has gradually transitioned from a mainly cash-oriented culture to one that is increasingly digital and technology-driven. This transition may be linked to several causes, including the growth of the telecommunications and banking industries, as well as the widespread use of cell phones and internet access. The launch of the Financial Sector Master Plan (FSMP) in 2001 represented a pivotal point in Malaysia's advancement toward cashless transactions. The FSMP laid the groundwork for modernizing the financial system, including initiatives to increase the use of electronic payments and reduce reliance on physical currency. This concept was critical in influencing the path of cashless acceptance. In addition, the FSMP seeks to establish a framework for creating an effective, competitive, resilient, and dynamic financial system that incorporates best practices, supports economic growth during all phases of the business cycle, and is anchored by robust and progressive domestic financial institutions that are increasingly technology-oriented and prepared to tackle the challenges posed by liberalization and globalization.

The introduction of digital payment systems such as mobile wallets, contactless cards, and online payment platforms has transformed the way people and organizations conduct financial transactions. This shift from traditional cash-based transactions to electronic forms of payment has far-reaching consequences for individuals, businesses, financial institutions, and governments. According to statistics, as of May 2022, Malaysian consumers prefer online banking as their primary cashless payment method, followed by debit cards, e-wallets, and credit cards (Statista Research Department, 2023).

To start, the growing prevalence of smartphones and internet access has made it easier for individuals to utilize digital payment platforms, enabling transactions without relying on physical cash. Additionally, the COVID-19 pandemic significantly impacted the rise of cashless payments, accelerating the shift toward contactless transactions, which is considered a more sanitary way to manage payments during this time. This indicates that the focus of this study is on Malaysian citizens, specifically looking at the use of various cashless payment

methods: prepaid cards (60%), internet payments (51%), debit cards (46%), credit cards (66%), and mobile phone payments (43%), with these percentages representing the rate of consumer usage (Rahman, et al., 2020).

The concept of cashless payment options is not well-established or fully developed in developing countries, particularly among Malaysian consumers. The growth of cashless payment systems is expected to persist, with a 2022 Consumer Payment Attitudes Study finding that 74% of Malaysian consumers have successfully adopted cashless transactions. The main digital payment methods currently used in the market include 70% for Card Online, 56% for Contactless Card, and 54% for Swipe/Insert Card (Visa, 2022). The study also indicated that since the pandemic, card payments have overtaken cash usage in Malaysia, suggesting that its residents are becoming more inclined toward cashless transactions. It is projected that Malaysia will evolve into a cashless society by 2030, meaning that most consumers will shift to cashless methods for their everyday financial activities, reducing their dependence on physical currency.

The increasing popularity of cashless payment systems has caused a significant transformation in the global landscape of financial transactions in recent years. As technology advances and consumer preferences evolve, digital payment options are steadily replacing traditional cash transactions. This shift not only enhances the ease of financial transactions for both individuals and businesses, but also has extensive implications for convenience, security, and financial inclusion. We explore the key factors driving the transition to cashless transactions in this era, along with the benefits and challenges that come with society's growing adoption of this innovative way to manage finances. A central element in studies focused on the usage and acceptance of digital or cashless payment methods is this variable, which is crucial for assessing individuals' willingness, intention, or actual behavior regarding various forms of electronic transactions, such as mobile wallets, credit/debit cards, online payments, and contactless systems. Researchers frequently use this variable to investigate the factors affecting users' acceptance or rejection of cashless payment systems. The Consumer Payment Attitudes Study (2022) indicates that the movement towards cashless transactions is gaining traction throughout Southeast Asia, with 93 percent of consumers adopting various digital payment methods, including cards, contactless cards, mobile wallets, and QR code payments. Malaysia is noteworthy, with 96 percent of consumers at the forefront of this shift (Visa, 2022).

The COVID-19 pandemic has accelerated the region's transition to a cashless society, with consumers managing to be cashless for an average of 11.6 days, which marks a 14.6 percent increase. Notably, Malaysia has the highest average at 12.9 days. More than half of Southeast Asian consumers, particularly in Malaysia, have considerably decreased their dependence on cash since the pandemic began (Visa, 2022). Contactless cards remain favored, with 44 percent of consumers in the region using them, an increase from 38 percent in 2020. The rise in contactless card usage during the pandemic points to their potential for ongoing growth. Additionally, mobile contactless payments show strong growth potential due to high awareness and interest levels, especially in Malaysia, where 80 percent are aware of this payment option and 72 percent indicate interest in adopting it (Visa, 2022). However, research indicates that a majority of Malaysian consumers still favor cash. Thus, we have pinpointed the variables of our study, which include performance expectancy, facilitating conditions, social influence, and perceived technology security.

Performance expectancy refers to how much consumers believe that using a system will help them improve their work performance (Chua et al., 2018). Facilitating conditions denote an individual's perception of the availability of technological resources that can aid in utilizing information systems (Venkatesh et al., 2003). According to Kelman (1961), social influence arises from persuasive communication. This implies that social influence pertains to how a person alters their behavior to conform to the expectations of their social environment, subsequently affecting their self-perception in relation to the influencer, other individuals, and society as a whole. Technology security involves identifying vulnerabilities within a security framework and finding appropriate solutions to mitigate the risks of technology failures or hacking of consumer data (Andreu, 2020). A study of 33 countries worldwide indicated that Malaysia had only 2% of consumer transactions being cashless five years ago (Thomas et al., 2013).

This study sought to fill a significant gap in the existing literature by assessing consumers' readiness for cashless transactions, including their access to financial services. The research employed the well-recognized

Unified Theory of Acceptance and Use of Technology (UTAUT) model. Several shortcomings were identified, indicating that technology in Malaysia lags behind that of other nations. While examining earlier studies that utilized the same theoretical framework, this research aimed to address the existing gap, as the UTAUT model has proven to be more efficient, precise, and accurate in previous investigations. Therefore, this study focused on exploring the adoption of cashless payment among undergraduate students, specifically within the Faculty of Business and Management (FBM) at UiTM Puncak Alam, Malaysia.

2. Literature Review

The transition to cashless transactions signifies a behavior change, where people stop using physical money for the exchange of goods and services. Instead, they choose electronic transfers or other non-electronic methods like checks (Tee and Ong, 2016). The implementation of electronic payment systems paves the path for an economy that operates without cash. This literature review aims to present a thorough overview of the existing knowledge regarding the usage of cashless applications. It addresses the various dimensions of this complex issue, including the factors that impact adoption such as Performance Expectancy (PE), Facilitating Conditions (FC), Social Influence (SI), and Perceived Technology Security (PTS) among citizens of Malaysia. The acceleration of the country's shift toward electronic payments (e-payments) has become a crucial focus of the Bank's efforts to enhance the efficiency of the nation's payment systems (Bank Negara Malaysia, 2011).

Adoption of Cashless Payment among Consumers (ACP)

In 2004, the government started to engage in e-payment initiatives by accepting bank cards and introduced a new Automated Teller Machine (ATM) card developed by the Malaysian Electronic Payment System (MEPS) to replace magnetic stripe ATM cards nationwide, as well as offering online payment services to consumers (Amir Akmar Basir, 2009). The evaluation of cashless payment adoption among consumers will focus on shifting market dynamics and the emergence of innovative payment technologies. Jeevan (2000) noted that Internet banking allows banks to provide cost-effective and high-value-added financial services. Technological advancements, increased competition and evolving lifestyles have transformed the banking landscape, prompting banks today to seek alternative methods to deliver distinct services, as highlighted in the journal article Bankers' Perspectives On E-Banking (Sharma, 2011).

The impact of technological innovation on establishing a cashless environment is influenced by the social and economic ramifications of widespread adoption, especially as developing nations strive to become developed ones for future generations, alongside businesses and consumers becoming more aware of the digital ecosystem (Yang et al., 2021). ACP emerges as an essential metric for understanding consumer behavior and preferences in financial transactions as it navigates the landscape of new technologies. Similarly, in a study investigating the adoption of cashless payments among Malaysian consumers, the dependent variable is the adoption of cashless payment methods, assessed through various indicators such as the frequency of cashless transactions and the utilization of specific cashless payment options (Rahman et al., 2020).

Performance Expectancy (PE)

Performance expectancy has been the subject of extensive research and is recognized as a crucial element influencing users' willingness to adopt and utilize technology. This research is often situated within the framework of technology acceptance models. Performance expectancy (PE) refers to an individual's belief regarding how utilizing a system can enhance their performance (Venkatesh et al., 2012). In other words, people are more likely to adopt new technology if they believe it will increase their work efficiency. Performance expectancies were integrated with five concepts drawn from various models. These concepts included relative advantage, extrinsic motivation, perceived usefulness, job fit, and outcome expectations (Chakraborty & Al Rashdi, 2018).

The Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), introduced by Davis in 1989, highlights that users' attitudes and intentions toward technology are significantly shaped by their perceptions of its usefulness and ease of use. A key component of perceived usefulness is performance expectancy, which reflects users' beliefs about how effectively the system will assist them in completing tasks or performing their jobs (Kraus et al., 2023). In the UTAUT model, performance expectancy is shaped by perceived usefulness, which is rooted in TAM (Venkatesh

et al., 2003). This research explores how performance expectancy influences the adoption and use of mobile applications in today's mobile technology landscape. The extent to which users feel a mobile app enhances their performance—whether through increased efficiency, convenience, or productivity—greatly affects their likelihood of embracing new technologies (Malik et al., 2017).

Facilitating Condition (FC)

Based on (Tarhini et al., 2016), employing various strategies to encourage Internet banking, along with offering access to the latest technologies and organizational support, can reduce barriers to using Internet banking and ultimately improve its actual adoption. This technology is essential, particularly for facilitating the acceptance of cashless payments among UiTM students. In today's world, cashless payments rely on internet connectivity and technological advancements. When adopting any new technology, providing facilitating conditions can offer valuable information, guidance, and training (Sivathanu, 2019). This adoption process simultaneously exposes all student populations to cashless payments and prepares them to utilize this payment method. As they become familiar with cashless transactions, they are likely to embrace this payment method as their preferred option for daily transactions. The facilitating conditions influence the adoption of cashless payments. It is important to comprehend and address these facilitating conditions to encourage the use of cashless payments within target groups.

Social Influence (SI)

Social influence refers to the psychological and sociological processes through which individuals, groups, or societal norms affect the thoughts, behaviors, and attitudes of others. It includes various types, such as conformity, compliance, and obedience, where individuals adapt to group expectations or respond to direct requests. The origins of influence vary widely, involving peers, authority figures, media, and cultural traditions. Elements like credibility, context, and social norms play a role in the effectiveness of social influence, impacting personal decisions and societal trends. This phenomenon is crucial for cultural transmission, maintaining social order, and forming collective identities. As people navigate the complexities of social influence, they both influence and are influenced by the intricate web of social dynamics in ways that are both conscious and subconscious. The concept of social influence (SI) has been extensively applied to assess customers' openness to adopting mobile payments (Peng, S., et al., 2017). Social influence involves an individual adjusting their behavior to meet the expectations of a social environment, thus changing their self-perception in relation to others, the influencer, and society as a whole. Family, friends, colleagues, and neighbors can serve as potential influences for customers to adopt cashless payment methods (Pillai, 2019). Social influence can also be enhanced by social media and other online platforms that share opinions and information about cashless transactions.

Perceived Technology Security (PTS)

The key factor influencing user interest in Internet banking is perceived technological security. Security worries have been recognized as a significant obstacle to e-commerce adoption (Salisbury et al., 2001). Technological security involves identifying security vulnerabilities and creating suitable responses to mitigate the risks of technological failures or breaches of consumer data (Andreu, 2020). Security should be a top priority for consumers regarding technology, as users' confidence in technology depends heavily on their perception of security. When individuals feel that their data and privacy are well protected, they tend to trust the technology more and, consequently, are more inclined to utilize it. The idea of perceived technological security centers on the deployment of strong systems designed specifically to safeguard consumer information. Whether it pertains to business or personal data, the technological security framework is essential in reinforcing the information exchange and preventing unauthorized access (Mohamad, Teh, Lai, & Chen, 2018).

This entails the tactical design and implementation of systems that extend beyond basic protection, incorporating a holistic strategy to prevent any unauthorized access. By establishing a secure environment, these systems not only safeguard sensitive data but also foster user confidence, assuring them that their information is protected from potential security threats. In today's world, where digital interactions are commonplace, the importance of such technology security measures is paramount. In the context of adopting cashless systems in the study, the perceived security of the technology can affect its perceived usefulness and ease of use, both critical factors in determining user acceptance and adoption for the research.

Hypothesis Development

Performance Expectancy (PE) Towards Adoption of Cashless Payment

One of the strongest factors affecting adoption behavior is performance expectation. Performance expectation refers to the user's belief that the technology will enhance their performance (Hung et al., 2019). Prior studies have shown that performance expectancy has a substantial effect on behavioral intention. Online banking enables customers to execute payments easily, rapidly, and with effective customer support, leading users to think it streamlines their financial processes (Martins et al., 2014). PE has been identified as a significant factor influencing the intention to accept technology (Lu & Kosim, 2022). Customers are more likely to utilize mobile banking services when the platform meets their expectations for efficiency and favorability, making performance expectancy a vital factor in the adoption of mobile banking (Alalwan et al., 2017). Furthermore, research has indicated that performance expectancy significantly affects the intention to engage with mobile banking, highlighting its major influence on user behavior (Changchit et al., 2017). Users' anticipation of positive outcomes, including feelings of achievement or satisfaction, affects their decisions to adopt technology. If users believe that integrating cashless payment methods enhances transaction efficiency, adds value, improves performance, provides relative benefits, and yields favorable results, they are more likely to adopt these methods into their financial practices. Additionally, PE is a crucial predictor of customers' intentions to use mobile banking services; however, these outcomes may vary based on the mobile banking features in different countries (Merhi et al., 2019). Thus, it was hypothesized that;

H1: There is a positive relationship between performance expectancy and the adoption of cashless payments.

Facilitating Conditions (FC) towards Adoption of Cashless Payment

When discussing technology, it relates to facilitating conditions (FC). The presence of a robust technology infrastructure, which includes accessible terminals, reliable internet connections, and user-friendly payment applications, is expected to positively influence consumer acceptance of cashless payments. Consumers are likely to keep using cashless payment options as long as they experience the convenience provided by service providers that simplify payments and transactions. Advances in technology have significantly aided the adoption of cashless payment methods, particularly among students at the Faculty of Business and Management in UiTM Puncak Alam. Therefore, facilitating conditions play a notably positive role in the adoption of e-wallets. Cashless payment requires the development of basic skills and standards such as using payment apps and sending or receiving text messages, which are known as facilitating conditions (Kiconco et al., 2020). In basic terms, the shift to cashless payments is reliant on the necessary technology and internet access for consumers. Technology is the key component of cashless payment systems. For instance, both smartphones and debit/credit card payment terminals are types of technology, as they serve as electronic devices needed to connect technology with the customer, along with the skills and knowledge required for their use. This indicates that facilitating conditions are closely linked to the adoption of cashless payments and are interdependent. These results suggest that when facilitating conditions are present, consumers often engage in social networks. Hence, it was hypothesized that;

H2: There is a positive relationship between facilitating conditions and the adoption of cashless payment.

Social Influence (SI) Towards Adoption of Cashless Payment

Social influence (SI) can alter individuals' views on embracing cashless payments as a new technological service. Typically, potential users consult those in their vicinity. This is why social influence has emerged as a key factor in the adoption of cashless payments. As previously stated, social influence can originate from a variety of sources, including family, friends, or even strangers. The decision to adopt cashless payments can be shaped by social influence, particularly through interactions with individuals who provide information about the new technology needed in our daily lives. In the realm of social influence, conforming to group behavior norms affects individuals and legitimizes their actions. Society plays a significant role in the adoption of technological advancements. The integration of technology involves two essential aspects: individuals' acceptance of the technology and its incorporation into society (Vannoy & Palvia, 2010). The social influence component has been widely recognized in the study of technology adoption and has demonstrated a positive effect on behavioral intentions. Hence, it is hypothesized that social influence will have a significant positive impact on the adoption of cashless payments among UiTM students in Malaysia. Social media and other digital platforms can amplify SI by spreading knowledge and opinions related to cashless transactions. Moreover, influencer marketing and social media tactics used by companies offering various cashless transaction methods can also positively influence a person's decision to adopt them (Thaker, Subramaniam, Qoyum & Hussain, 2022). As such, it was hypothesized that;

H3: There is a positive relationship between social influence and the adoption of cashless payments.

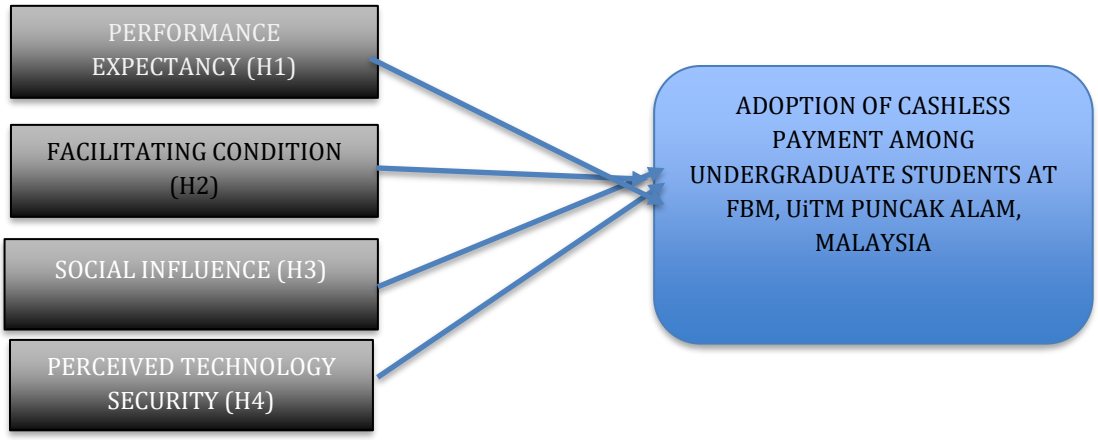
Perceived Technology Security (PTS) Towards Adoption of Cashless Payment

Embracing cashless payment systems brings a variety of benefits for consumers. These payment methods provide both convenience and speed (Teo, Tan, Ooi, Hew, & Yew, 2015). Integrating cashless payment options can shape perceptions regarding technology security by generating both trust and apprehension. Various studies highlight important factors and recommend strategies to influence the adoption of cashless payments (Mukhopadhyay, 2016; Ozturk, 2016). While some users view it as a secure and convenient choice due to advancements in encryption and authentication, others may raise concerns about possible cybersecurity risks, fraud, or data breaches linked to digital transactions. Ultimately, how individuals perceive this technology relies on their personal experiences, understanding of security measures, and the effectiveness of the technologies in place. The efficiency and competence of a nation's financial and monetary institutions are vital to economic growth and are significantly affected by the widespread use of cashless payment systems (Essame 2006, Hasan et al. 2012, Zandi et al. 2013). Therefore, as users become more informed about the security features of cashless payment systems, their perceptions of overall technological security tend to improve. Additionally, factors such as educational initiatives, transparent communication regarding security protocols, and user-friendly technology also influence the students from various universities in Malaysia studied here. Research indicates that perceived technology security is one of the primary factors affecting the acceptance of cashless payments (Liu et al., 2019). When users hold a positive view of technology security, they can utilize this insight to create consumer products and services that support the widespread adoption of cashless payment systems, thus improving the overall efficiency and reliability of digital transactions. Therefore, it was hypothesized that;

H4: There is a positive relationship between perceived technology security and the adoption of cashless payment.

The conceptual framework from the earlier study is illustrated in Figure 1. The UTAUT framework was employed to identify the variables relevant to the study in focus. UTAUT is a theory that encompasses key constructs, including performance expectancy, facilitating conditions, social influence, and effort expectancy. Various theories and models regarding technology acceptance have been created as a framework to investigate how individuals understand and embrace new technologies, how they utilize them, and the potential impact of their use on ongoing engagement (Momani, 2020). Referring to Figure 1, H1 represents performance expectancy, H2 indicates facilitating conditions, H3 denotes social influence, and H4 refers to perceived technology security.

Figure 1: Adopted Conceptual Framework Study (Rahman et al., 2020)



3. Research Methodology

A quantitative research study was carried out to investigate the adoption of cashless payment methods among undergraduate students at FBM, UiTM Puncak Alam. In this study, questionnaires were shared with students from the Faculty of Business and Management at the UiTM Puncak Alam campus via social media platforms like

WhatsApp and Telegram. The data from the questionnaires were analyzed using SPSS software (Statistical Package for Social Sciences) Version 27.

The focus of this study was a population of 6,325 undergraduate students from the Faculty of Business and Management at UiTM Puncak Alam. A sample of 113 undergraduate students was chosen for this study. A convenience sampling method was used as the sampling technique for this research. Participants were selected based on their availability and willingness to participate. Primary data for this research was gathered through questionnaires. The survey questionnaire is divided into six sections. Section A is based on Nominal and Ordinal scales, while Sections B through F utilize an interval scale, commonly referred to as the Likert scale. In this study, the scale ranges from 1 (strongly disagree) to 4 (strongly agree).
The questionnaire consists of six sections as listed below:

- Section A: Demographics
- Section B: Performance Expectancy (PE)
- Section C: Facilitating Condition (FC)
- Section D: Social Influence (SI)
- Section E: Perceived Technology Security (PTS)
- Section F: Adoption of Cashless Payment (ACP)

After performing a descriptive analysis of the data, multi-regression was conducted using SPSS version 26, and Cronbach's alpha was used to test the normality and reliability of the data.

4. Results

The analysis method entails a comprehensive review of data collected through a Google Form distributed to both male and female students at UiTM Puncak Alam Faculty of Business and Management. The data collected was examined and interpreted using Statistical Package for the Social Sciences (SPSS) Version 27. The interpretation of patterns, trends, and correlations present in the data set is derived from this quantitative analysis. The main research question aimed to investigate the relationship between the Adoption of Cashless Payment and factors such as Performance Expectancy, Facilitating Conditions, Social Influence, and Perceived Technology Security, utilizing statistical techniques for an in-depth understanding. Descriptive statistics were calculated to offer a summary of the data. The purpose of the analysis was to identify patterns and trends that enhance our understanding of how individuals use technology for payments. The age segment consists of four categories of participants. Furthermore, this study included reliability analysis, regression, and Cronbach's Alpha.

Respondents' Profile

The study included a mixed sample of participants, comprising both male and female respondents, and they ranged in age from 18 to 27 years old and older. The vast majority have a business management bachelor's degree. The UiTM Puncak Alam campus served as the source of respondents, who offered insights into the preferences and actions of students in an academic environment. The bulk of respondents reported regularly using computers, cell phones, and other digital devices, demonstrating their high degree of technical skill. To ensure representation from a range of academic levels and demographic groupings within the Faculty of Business Management, respondents were chosen using stratified random sampling. The questionnaire included 113 participants in all, which produced a sizable dataset for the study.

Table 1: Demographic of the Respondents

	Items	%
Gender	Male	35.4%
	Female	64.4%
Age	18-20 years old	16.8%
	21-23 years old	71.7%
	24-26 years old	9.7%
	27 years old and older	1.8%
Semester	1	8%
	2	10.6%

3		19.5%
4		16.8%,
5		38.9%
6		6.2%
"Do you know	YES	98.2%
Cashless payment?	NO	1.8%

Data Normality Test

This study used SPSS to conduct the normality which is to determine the skewness and kurtosis. The outcome demonstrated that the data gathered was within an acceptable range of data normality. The evaluation for the normality test for each of the variables under consideration is shown below:

According to Table 2, the dependent variable for the adoption of cashless payment (ACP) recorded a mean of 3.5113 and a median of 3.5000. The independent variables, which include Performance Expectancy (PE), Facilitating Condition (FC), Social Influence (SI), and Perceived Technology Security (PTS), exhibited mean values of 3.4707, 3.5315, 3.2140, and 3.2815, respectively.

Performance Expectancy and Facilitating Conditions both have a median of 3.500, while Social Influence and Perceived Technology Security have a median of 3.2500. If the skewness is zero, it indicates that the data is perfectly symmetrical, which is quite rare in real-world datasets. Skewness values below -1 or above 1 suggest a highly skewed distribution. Skewness ranging from -1 to -0.5, or from 0.5 to 1, signifies a strongly skewed distribution. When skewness falls between -0.5 and 0.5, the distribution is considered approximately symmetrical (Klima 2022). The findings indicated that each variable exhibited normal data, with skewness values for Adoption of Cashless Payment at -0.301, Performance Expectancy at -0.621, Facilitating Condition at -0.623, Social Influence at -0.174, and Perceived Technology Security at -0.357. Data with skewness less than 3 are deemed normal. Hair et al. (2010) described normal data as exhibiting skewness values ranging from -2 to +2 and kurtosis values from -7 to +7.

Table 2: Data Normality Test

	OVRL_PE	OVRL_FC	OVRL_SI	OVRL_ PTS	OVRAL_A CP	
N	Valid	111	111	111	111	111
	Missing	0	0	0	0	0
Mean		3.4707	3.5315	3.2140	3.2815	3.5113
Median		3.5000	3.5000	3.2500	3.2500	3.5000
Mode		4.00	4.00	3.00	3.00	4.00
Std. Deviation		.45942	.45241	.53390	.51469	.42291
Skewness		-.621	-.623	-.174	-.357	-.301
Std. Err. of Skewness		. 229	.229	.229	.229	.229
Kurtosis		-.080	-.269	-.547	-.362	-.969
Std. Err. of Kurtosis		.455	.455	.455	.455	.455
Minimum		2.00	2.25	1.75	2.00	2.25
Maximum		4.00	4.00	4.00	4.00	4.00

The kurtosis assessment results indicated that the variable for Adopting Cashless Payment (ACP) had a kurtosis value of -0.969, Performance Expectancy (PE) was -0.080, Facilitating Condition (FC) was -0.269, Social Influence (SI) was -0.547, and Perceived Technology Security (PTS) was between 0.423 and -0.362. According to Hair et al. (2010), data is considered normal if its skewness ranges between -2 to +2 and kurtosis falls between -7 to +7. Therefore, the data collected is appropriate for further analysis.

Reliability

Table 3 presents the findings from the internal consistency analysis regarding the dependent variable, which was the Adoption of Cashless Payment, alongside the independent variables: performance expectancy, facilitating condition, social influence, and perceived technology security. The Cronbach's Alpha offers reliable

evidence for the dependent variable; the intention to use e-wallet, in relation to the independent variables; (i) performance expectancy, (ii) facilitating condition, (iii) social influence, and (iv) perceived technology security. Overall, the internal consistency results are favorable, with values greater than 0.6, as suggested by Konting et al. (2009). According to Table 3, all Cronbach's Alphas surpassed 0.6, indicating that the research questionnaire is both pertinent and trustworthy.

Table 3: Reliability Test (Cronbach's Alpha)

Variable(s)	Item(s)	Cronbach's Alpha
PERFORMANCE EXPECTANCY	Q1: Cashless payment is useful to save time. Q2: Cashless payment would enable me to conduct tasks more easily (i.e: financial transfer, shopping). Q3: Cashless payment would increase my productivity. Q4: Cashless payment would improve my work performance	0.779
FACILITATING CONDITIONS	Q1: I have the resources necessary to use cashless payment. (i.e: smartphone, debit card, etc) Q2: Cashless payment is compatible with other applications I use. Q3: I am given the necessary support service and assistance to use cashless payment. Q4: I know necessary to use cashless payment.	0.818
SOCIAL INFLUENCE	Q1: Celebrities influence my behavior by using cashless payments Q2: Family members influence my behavior in using cashless payments. Q3: Friends and colleagues influence my behavior by using cashless payments. Q4: The majority of people around me are utilizing cashless payments.	0.640
PERCEIVED TECHNOLOGY SECURITY	Q1: I feel completely secure operating with cashless payment. Q2: Cashless payment is a secure means of sharing sensitive information. Q3: High consent with safety about online cashless payments. Q4: I think it is secure to adopt cashless payments for students.	0.81738

Table 4: Multiple Regression - ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig
Regression	6.838	4	1.709	14.118	<0.01b
Residual	12.835	106	0.121		
Total	19.673	110			

Multiple linear regression in Table 4 shows an F value of 14.118, where the regression value is <0.01beta with the R square of 0.348. Thus, all the independent variables used in this study were significant. Then, Table 5 summarizes the hypothesis' results. Based on the multiple regression coefficients, only H1 and H4 have a significant relationship($p<0.05$), while H2 and H3 are not.

Table 5: Coefficients

Model	Unstandardized B	Coefficients Std. Error	Standardized t Coefficients Beta	Sig.	Result	
1.(constant)	1.241	0.325		3.823	<0.001	
OVRL_PE	0.214	0.091	0.233	2.366	0.020	**SUPPORT**
OVRL_FC	0.147	0.085	0.157	1.725	0.087	**REJECT**
OVRL_SI	0.043	0.068	0.055	0.636	0.526	**REJECT**
OVRL_PTS	0.264	0.077	0.321	3.435	<0.001	
SUPPORT						

Multiple Regression in Table 6 indicates an R-squared value of 0.348, signifying that 34.8% of the variance in the dependent variable, which represents the factors influencing the adoption of cashless payment among the

undergraduates, can be explained by changes in the selected independent variables: Performance Expectancy, Facilitating Condition, Social Influence, and Perceived Technology Security. The remaining percentage is attributed to other factors not included in the model.

Table 6: Multiple Regression - Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.590a	0.348	0.323	0.34798

Discussion

Table 7: Hypothesis Analysis

	IV	Hypothesis	Analysis
1.	Performance Expectancy	H1: There is a positive relationship between performance expectancy and the adoption of cashless payment.	**Accepted**
2.	Facilitating Condition	H2: There is a positive relationship between facilitating conditions (IV2) and the adoption of cashless payment (DV). H0: There is no relationship between facilitating conditions (IV2) and the adoption of cashless payment (DV).	**Rejected** **Accepted**
3.	Social influence	H3: There is a positive relationship between social influence and (IV3) and the adoption of cashless payment. H0: There is no relationship between social influence (IV3) and the adoption of cashless payment (DV)	**Rejected** **Accepted**
4.	Perceived Technology Security	H4: There is a positive relationship between perceived technology security (IV4) and the adoption of cashless payment (DV).	**Accepted**

The overall findings of this study are presented in Table 7, which includes the variables of performance expectancy, facilitating conditions, social influence, and perceived technology security at a moderate level. On a scale of 1 to 5, the most probable final result of these findings is 3. The hypothesis analysis indicates that performance expectancy is supported by the accepted hypotheses. In contrast, facilitating conditions are not supported. Similarly, social influences are rejected, while perceived technology security is backed by accepted hypotheses. It can be concluded that the adoption of cashless payment is affected by these four factors.

5. Conclusion and Recommendations

In conclusion, this research sought to explore the acceptance of cashless payments among university students, concentrating on aspects such as performance expectancy (PE), facilitating conditions (FE), social influence (SI), and perceived technology security (PTS). The research goals of this study have been successfully achieved, including assessing the impact of performance expectancy and facilitating conditions on the adoption of cashless payments, analyzing the role of cashless payment methods in economic interactions and the broader financial ecosystem, and recognizing the effect of perceived technology security on cashless payment usage.

The exploration of the research questions led to meaningful insights regarding the examined factors. The results supported the hypothesis that there is a positive relationship between performance expectancy and the adoption of cashless payments. However, the hypothesis was not supported due to the absence of a statistically significant link between facilitating conditions and the adoption of cashless payments. Perceived technology security displayed a positive association with the acceptance of cashless payments, while social influence did not demonstrate a significant impact. Consequently, future studies might explore various methods or expand the scope to enhance the comprehension of the factors influencing cashless payment adoption. Nevertheless, the thoroughness and precision of the selected research methodology have been essential in providing valuable evidence and advancing the understanding of the elements affecting the adoption of cashless payment options.

Managerial Implications and Recommendations

Cashless payments are increasingly popular these days. Nevertheless, some individuals still choose traditional payment methods over this approach. Enhancements are recommended, and additional explanatory elements may need to be incorporated when integrating cashless payments into contemporary society. Hence, it is advised that further investigations into various aspects of cashless payment adoption receive careful attention. Drawing from this research, three suggestions are provided to assist in the transition to cashless payments which are;

Awareness and Information of Cashless Payment - Disseminate as much information on the advantages of cashless transactions in everyday life. There are still some users who make transactions entirely with cash since they may not be aware of the advantages of using cashless payment methods. Further, cashless transactions encourage cleanliness in the current digital age by reducing the interchange of physical currency, which may contain bacteria. Accepting cashless transactions promotes a more efficient, safe, and contemporary financial environment in addition to being in line with technological developments.

Cost of Merchants - The majority of the businesses that did not apply for cashless choices were most likely due to the fees associated with relying on cashless merchants. Merchants are required to pay the Merchant Discount Rate (MDR) for each transaction they execute (iPAy88, 2023). It is a percentage that includes the charges of payment gateways, acquiring and issuing institutions, and card schemes (Visa, MasterCard, Amex, etc.). It is crucial that stakeholders, including financial institutions and legislators, investigate ways to allay these fee worries to promote a more equitable and cost-effective shift to cashless transactions and wider use of cashless choices.

Security Improvement - Since the fear of hacking events and cyberattacks continues to be a major barrier to mainstream adoption, it is imperative to address user concerns over the connecting of bank accounts to cashless services. Building trust and ensuring the integrity of cashless transactions requires the implementation of strong security measures, such as multi-factor authentication, advanced encryption protocols, and frequent system updates. This reassures users that their financial information is well-protected against potential threats.

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The Service Experience Equity on Repatronage Intention within Public Transportation Services

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Abstract: In a highly competitive market, service providers are often expected to enhance their profitability by delivering superior service quality. This principle is evident among many public transportation providers in Malaysia, who strive to elevate the passenger experience through refined service offerings. The objective of this study is to examine the factors influencing repatronage intentions among public transportation users in Malacca, Malaysia, using the Service Experience Equity (SEE) framework. To demonstrate the causal connections between the variables, a regression analysis has been employed. The findings reveal that service atmosphere and personnel interactions significantly impact users' willingness to continue using these services. The study emphasizes the importance for management to prioritize customer experience by investing in service environment strategies that foster user engagement and discourage customer churn. It further underscores that both the overall service experience and the quality of employee-customer interactions are critical determinants of future patronage. Consequently, it is recommended that transportation service providers leverage these elements to create a competitive edge, thereby encouraging repeat usage and building long-term customer loyalty.

Keywords: *Service Experience Equity, Patronage Intention, Public Transport Services, Customer Loyalty, Customer Equity*

1. Introduction and Background

The extant literature suggests that to maintain profitability and achieve competitive advantage, a firm to continuously invest in retaining consumers. Hence, firms are expected to deliver superior service and reduce service failure. The public transportation service providers are without exclusions. Despite continuous investments and efforts by public transportation providers to enhance service quality and engage users, customer retention remains a persistent challenge in the sector. Frequent complaints and declining repatronage rates highlight the vulnerability of users, even in the face of ongoing improvements. The existing literature predominantly addresses consumer behavior and retention in developed nations, leaving a gap in understanding these dynamics within the context of emerging markets like Malaysia. Additionally, while service environment, employee interactions, and service convenience are identified as critical factors influencing customer retention, their specific impact on public transportation users' willingness to continue using these services in Malaysia remains underexplored.

Addressing these gaps is essential for public transportation providers to formulate effective strategies that reduce customer dissatisfaction, encourage repeat usage, and build long-term loyalty. Investments in customer retention have become a main focus and have been set as a key role in measuring the firm's performance. While much of the literature focuses on consumers in developed nations, Elgheit's (2018) study emphasized the need to extend perspective to fully grasp the dynamics of shifting consumer behavior. In today's increasingly competitive climate, customer retention is an essential component of every business's strategy. The majority of past research on the variables influencing customer retention has focused on retention from the perspective of the consumer. Several academics consider customer retention to be the likelihood for consumers to remain with their service providers, and hence a behavioral component (Hwang, Kim, Park, & Kwon, 2020). According to several kinds of literature, patronage intention is the likelihood that customers will continue to patronize service providers and is thus part of a behavioral component (Ranaweera & Prabhu, 2003). When a company realizes the significance of patronage intention, it will place a greater emphasis on retaining consumers. To outperform the competition and keep consumers coming back, businesses have prioritized relationship

marketing strategies that lower customer dissatisfaction. These strategies focus on better understanding and catering to customers' wants and requirements (Nasir & Mahmood, 2018). As a result, it will have a favorable effect on the performance and image of the organization. In addition, if an organization can maintain its clients, it may save a great deal of money while attempting to acquire new ones. This is backed by Ullah, Raza, Malik, Imran, Islam & Kim (2019) who noted that it may be more cost-effective to retain existing consumers than to acquire new ones. Therefore, this article aimed to explore the extent to which service experience equity would affect user retention in the public transportation sector. The three service experience equity that is identified, namely service environment, employee service, and service convenience. In designing the framework for the study, the customer equity theory has been used.

Customer Equity Theory

It is a framework that focuses on maximizing the total lifetime value of a firm's customer base. Developed by Rust et al (2004), this theory emphasizes that the ultimate value of a company lies not in its products or services but in its customers. The theory posits that by managing the drivers of customer equity—value equity, brand equity, and relationship equity—companies can build long-term profitability and sustain competitive advantage. Customer Equity Theory suggests that companies should strive to balance and optimize these three components to enhance overall customer equity, which is the sum of the value of current and future customer relationships. In this study, the elements of service environment**,** employee interactions**,** and service convenience all significantly contribute to shaping customer equity by influencing its three core components: value equity**,** brand equity, and relationship equity**.** These factors collectively determine how customers perceive and engage with a brand, thereby affecting their overall satisfaction, loyalty, and long-term profitability. The environment, in this context, refers to the physical and digital settings, atmospheres, and service contexts where customer interactions with a brand occur. This includes factors such as store ambiance, cleanliness, digital platform usability, and overall service atmosphere. Each of these elements can significantly impact how customers perceive the company and their subsequent decisions to continue patronizing its services. On the other hand, employee interactions are critical touchpoints in shaping customer experiences, especially in service industries. Employees act as the face of the company, and their behavior, attitude, and competence greatly influence customer perceptions. Finally, service convenience directly enhances value equity by minimizing the time, effort, and resources customers have to expend to use a service. For example, a transportation service that offers convenient digital ticketing options and seamless scheduling tools increases perceived value by making the service more user-friendly and efficient. Thus, it becomes necessary to study these variables to understand the patronage intentions of the general public in transportation usage.

2. Literature Review

Service Experience Equity

Through the process of value creation, the traditional marketing strategy centered on the product is progressively giving way to one centered on the service (Vargo and Lusch, 2003). It is driven by the criteria of quality, cost, and convenience. However, service experience goes beyond the traditional perspective of value proposition since customers want to feel emotional advantages, such as "a combination of excitement, entertainment, and adventure that assures “a genuine whole customer experience" (Mascarenhas et al., 2006). The proliferation of consumer touchpoints across media and channels has increased the complexity of customer journeys, which has led to a greater emphasis on customer experience (Lemon & Verhoef, 2016). Therefore, it is important to look at service experience equity components to further understand the value proposition offered.

Service Environment

The service environment represents the perceptible physical characteristics of the service encounter as perceived by the consumer. Bitner (1992) defines servicescape as the tangible aspects offered to clients in a business environment, such as the ambiance, architectural design, layout, interior décor, equipment, and signs. A well-crafted service environment is pertinent to customer experience as it provides physical and functional benefits for the customers (Patrício et al., 2011). The service environment also helps patrons to evaluate the services provided (Wong and Fong, 2012). Roy et al (2022) suggest that a service environment enhances customer experience through socioeconomic and societal exchanges. The work from Rosenbaum and colleagues also supports that a commercial built environment can serve as a third place and be used to fulfill

customer functional and emotional needs (Rosenbaum and Massiah, 2007). Thus, a firm's service environment provides customers with functional and emotional experiences through the interaction of the service encounter (Chang and Horng, 2010).

Repatronage Intention

Intentions are subjective judgments about how a person will behave in the future and usually serve as dependent variables in many service research and satisfaction models (Park, 2020). Al-Adwan, Al-Debei, & Dwivedi (2022) argue that repurchase intentions and actual repurchase patterns are not necessarily the same. While Soderlund and Ohman (2003) consider repurchase intentions as intentions-as-expectations, Shamma, El Masry, & Dutot (2023) defined repurchase intention as 'the individual's judgment about buying again a designated service from the same company, taking into account his or her current situation and likely circumstances'. In short, customers tend to purchase and repurchase a product or service that can maximize their benefits (Le et al, 2023).

Employee Service

Customers receive both practical and emotional advantages as a result of their contact with members of the serving staff (Chang and Horng, 2010). This idea may be understood as the experience they have with employee service. Providing excellent customer service is the most important factor in maintaining a high level of customer satisfaction. Shagirbasha, Madhan, and Iqbal (2024) examine how employee-customer interactions influence emotional responses in service contexts. Their research found that the nature and frequency of interactions significantly affect customer emotions, which can be either positive or negative depending on the quality of the interaction. This is crucial for understanding how employee behavior shapes customer perceptions and loyalty in service industries Disse and Becker-Özcamlica (2022)in their research explore how employee behavior aligned with sustainable market orientations (SMOs) positively influences customer attitudes and behaviors, including trust and word-of-mouth, which are crucial for customer retention and satisfaction in service organization. In addition to this, strong customer service provided by employees will have a positive influence on marketers and has the potential to shape the experience of consumers, which has the potential to increase customer satisfaction and loyalty (Wong and Fong, 2010). On the other hand, Bentein et al (2022). demonstrate that to mould the customer's perception of service quality, the behavior of the employee plays a significant role. This is because employee service performance is also one of the factors that contribute to companies' profits. According to Liao Hui and Chuang (2004), having an awareness of the elements that predict the degree of service offered by employees is a necessary component. The phrase "employee service" may also be described as the behaviors of workers that need to be controlled and are relevant to the goals of the company.

The combination of the service performance of employees was important to produce a collective phenomenon at the organizational level. This was necessary for organizational effectiveness to be associated with service quality, customer happiness, and customer loyalty. Aside from that, Snyder et al (2022) asserted that social interactions were included in the service procedures that took place between service personnel and a consumer. Alongside customer service, staff service is one of the variables that will affect a consumer's propensity to purchase. Today, a great number of businesses are aware of this aspect, and consequently, they will work to ensure that their workers provide the highest possible level of service to fulfill the requirements of their clients and foster positive relationships with them.

Service Convenience

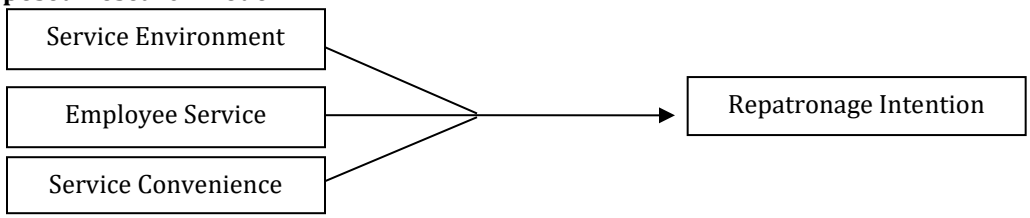
A variety of converging socioeconomic phenomena, according to Brown (1990), encouraged consumers and companies to seek convenience in the products and services they purchased in the 1980s. Bryson and Daniels (2010), emphasized that while service convenience is a critical component of service-based economies, it remains under-researched compared to other service quality dimensions. Their study, included in the *Handbook of Service Science*, argues that convenience is often taken for granted, despite its significance in influencing customer satisfaction and behavior in service-oriented markets. Kaura, Prasad, and Sharma (2015) found that service convenience plays a significant role in influencing customer satisfaction and loyalty. Their research highlights that service convenience, when combined with perceived fairness and service quality, can greatly impact customer contentment and encourage repeat patronage, making it a critical element for service providers to focus on in service-based economies. They demonstrate that convenience plays a significant role

in shaping customer experiences and satisfaction, which in turn enhances loyalty. Chang and Hsu (2010), highlight that service convenience significantly influences customer satisfaction and loyalty. They found that the convenience of service can enhance perceived service value, which in turn affects post-purchase behaviors, making service convenience a critical factor across various stages of the customer. According to the majority of the publications reviewed, simplicity of service is highly important since it impacts client purchasing behavior.

In the customer equity theory, value equity is the rational assessment of a service's value based on quality, price, and convenience. Therefore, service convenience contributes directly to value equity by reducing the effort and time required to access and benefit from the service. This is particularly critical in scenarios where customers prioritize efficiency and ease of use. As mentioned by Brown (1990) there were five dimensions concept of convenience. The first one is the time dimension. Marketers need to provide services for customers at convenient times. For example, it will be convenient for the customers to shop at the night market to get wet produce. It is due to the time constraint in which they do not have time to shop during working hours. The second-dimension concept of convenience is the place dimension. To make customers feel more convenient, service providers must provide services at convenient places. For example, it will be convenient for the customers if marketers provide home services such as facial or massage treatments at customers' houses. In addition to time and space, the third dimension is acquisition. Furthermore, internet and property purchases are excellent examples of how to make acquisition more pleasant because a simple message via Whatsapp or a phone call may finalize the transaction. The fourth dimension is the dimension of usage. This entails making sure clients are comfortable and convenient when utilizing or purchasing services.

The author also noted that service convenience is classified into five types: choice convenience, access convenience, transaction convenience, benefit convenience, and post-benefit convenience. The author claimed that decision convenience implies that clients should spend adequate time and effort to acquire services or make decisions. The second factor is the ease of access. Consumers' perceived time and effort expenditures must be engaged to commence service delivery. Bitner, Brown, and Meuter (2000) state that the physical and temporal separation of a service might hurt its delivery capability and adaptability. Transaction convenience is the third form of service convenience. This transaction may be influenced by the consumer's perceived time and effort after purchasing the services or performing the transaction. The consumer's perceived time and effort expenditures to experience or acquire the real advantages from the service given are referred to as benefit convenience. Customers, for example, will acquire either a positive or negative experience. When the service is poor, it will cost you a lot of time and effort. Last but not least, post-benefit comfort. One of the most critical factors influencing client retention is post-benefit ease. If it's good, it'll keep more customers.

Figure 1: Proposed Research Model



3. Research Methodology

The following procedures are observed in conducting this research.

Data Collection and Measures

A total of 300 questionnaires were handed out to a wide range of relevant responders. These respondents come from a wide variety of public populations, ranging from those who use public transit regularly to those who only use it irregularly. The data for this study were collected using a sample approach called convenience sampling throughout its whole. However, only 255 of the total 300 questionnaires that were handed out were considered appropriate for further investigation. The remaining surveys were considered invalid because they included insufficient information. A structured questionnaire consisting of questions asked in a certain order was used to collect the data for this study. To tailor the questionnaire items to the needs of the study, several

sources of information were altered. On a Likert scale with seven points, responses ranged from "strongly disagree" (point 1) to "strongly agree" (point 5) for all of the items. The activity was carried out for a total of three weeks, beginning at 10 in the morning and ending at 6 in the evening, seven days a week. In this study, service experience equality (SEE) is conceived of as a latent construct that takes into consideration the perspectives of the public service experience on three dimensions: the service environment, staff service, and service convenience.

4. Findings and Discussion

Frequency Distribution

The data for the respondent's profile are obtained from the questionnaires which is in section A. Section A consists of 6 questions which comprise the respondent's gender, age, race, educational level, employment sector, and income level. The table below shows the results.

Table 1: Respondents' demographic profile

No	Profile	Description	Responses	Percentage
1	Gender	Male	115	46%
		Female	135	54%
2	Age	18 - 25 years	75	30%
		26 – 33	60	24%
		34 - 41	65	26%
		42 and above	45	18%
3	Race	Malay	165	66%
		Indian	60	24%
		Chinese	25	10%
		Others	-	-
4	Educational Level	Secondary	15	6%
		Undergraduate	195	78%
		Postgraduate	40	16%
5	Income Level	Below RM1000	30	12%
		RM2001 – RM3000	135	54%
		RM3001 – RM4000	53	22%
		RM4001 - above	32	12%
6	Employment Sector	Government	5	2%
		Private	170	67%
		Self-employed	35	14%
		Student	38	15%
		Others	2	2%

In terms of age, 18–25-year-olds account for 30 percent, 26–33-year-olds account for 24 percent, 34–41-year-olds account for 26 percent, and 42-year-olds and above account for 18 percent. For respondent race, respondents were Malay, respondents were Indian, and respondents were Chinese. Based on the educational level, most of the respondents are secondary school leavers which accounts for 15 percent of the response. The most responses were received from the undergraduate level. This is mainly because most of the users are young working adults. They accounted for the largest number of users of public transport in this study. Looking at the income level, most of the respondents received an income level of RM2001- RM3000 which accounted for 54 percent of the total respondents.

Correlations Among Variables

According to the results of the study, the level of relationship between the three independent variables (service environment, staff service, and service convenience) was between moderate and strong. This outcome provides support for the hypothesis.

Table 2: Correlations among variables

	A	B	C	D
Repatronage Intentions (A)	1.00			
Service Environment (B)	0.569*	1.00		
Employee Service (C)	0.215*	0.463*	1.00	
Service Convenience (D)	0.111	0.427	0.656	1.00

Note: *correlation is significant at the 0.01 level (two-tailed)

Regression Analysis

The results from the multiple regression analysis, as illustrated in Table 3, demonstrate that the three independent variables—service environment, employee service, and service convenience—collectively explain 54.7% of the variance in passenger repatronage intentions (R = 0.547). This indicates that more than half of passengers' decisions to continue using a specific transportation service are influenced by these factors. The analysis yielded an F value of 54.711, which is statistically significant at $p < 0.000$, affirming the model's robustness. The detailed coefficients in Table 4.12 reveal that the service environment has the highest impact on repatronage intention, with a standardized beta coefficient of 0.569 and a significance level of 0.000, making it the most influential predictor. Employee service also significantly contributes to retention ($\beta = 0.215$, $p = 0.009$), highlighting the importance of high-quality staff interactions. In contrast, service convenience shows a lower beta value ($\beta = 0.111$) and is not statistically significant ($p = 0.885$), suggesting that convenience alone does not substantially influence passengers' loyalty. The study's multicollinearity diagnostics—tolerance values above 0.1 and Variance Inflation Factors (VIF) below 10—confirm that the independent variables are not highly correlated, thereby minimizing multicollinearity concerns.

The findings suggest that creating a positive service environment is paramount for retaining passengers, as customers prioritize superior physical facilities and atmosphere over convenience. This includes well-maintained stations, comfortable seating, and aesthetically pleasing surroundings. Additionally, employee service quality is a critical factor; when personnel exhibit professionalism and attentiveness, it fosters trust and increases the likelihood of repeat business. Conversely, service conveniences, such as ease of access or straightforward scheduling, appear to be a less decisive factor in influencing repatronage intentions. This result implies that while convenience may attract initial usage, it does not ensure long-term customer loyalty if the service environment and staff interactions are lacking. In summary, the regression analysis confirms that the service environment is the most significant determinant of customer retention, followed by employee service. These insights suggest that public transport providers should prioritize investments in enhancing the physical environment and staff training to secure long-term customer loyalty.

Table 3: Summary of regression analysis

Summary		**ANOVA**		**Dimensions**	**β**	**t**	**p**	**Collinearity Statistics**	
R	ΔR^2	F	Sig.					Tolerance	VIF
.547	.537	54.711	0.000	Service Environment	0.569	1.326	0.000	0.759	1.317
				Employee Service	0.215	4.928	0.009	0.529	1.892
				Service Convenience	0.111	1.743	0.885	0.550	1.819

Note: predictors (constant) service environment, employee service, service convenience

5. Conclusion

The service atmosphere, personnel service, and service ease—collectively explain 53.7% of the variance in repatronage intention, indicating that other factors may also significantly influence passengers' decisions to remain loyal. Future research should explore these additional determinants to gain a more comprehensive understanding of retention drivers in the public transportation sector. For transport service providers, enhancing the service atmosphere is crucial, as it not only attracts new passengers but also makes them feel more comfortable and connected to the service. A positive service environment fosters place attachment,

satisfaction, and loyalty. While traditional research has primarily focused on tangible aspects such as architectural design, layout, interior decor, equipment, and signage, other less explored elements must also be identified and developed to significantly elevate the overall service experience. In conclusion, cultivating strong, long-term customer relationships and delivering tailored high-quality service experiences are essential for ensuring repeat patronage and achieving sustainable business success. By prioritizing customer satisfaction and strategically investing in service environment enhancements, public transportation providers can strengthen user engagement, build loyalty, and create a lasting competitive advantage in the marketplace.

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The Effect of Innovation and Renewable Energy on CO_2 Emissions For Emerging Asian Countries

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Abstract: This study investigates the impact of innovation and renewable energy consumption on CO2 emissions in seven emerging Asian countries using static panel data methods. The analysis employs Pooled Ordinary Least Squares (OLS), Fixed Effect (FE), and Random Effect (RE) models to estimate the relationships, with the most appropriate model selected based on the Breusch-Pagan LM test and the Hausman test. Our findings reveal that both GDP and urbanization significantly increase CO2 emissions, while GDP squared and renewable energy consumption significantly decrease emissions, supporting the Environmental Kuznets Curve (EKC) hypothesis. Diagnostic tests indicate the presence of heteroskedasticity and first-order autocorrelation, addressed using robust standard errors. The results underscore the dual role of economic growth and technological advancement in shaping environmental outcomes, highlighting the critical importance of sustainable development policies in emerging economies.

Keywords: *CO2 emissions, innovation, renewable energy, Environmental Kuznets Curve, static panel data, emerging Asian countries.*

1. Introduction and Background

Asian economies have experienced strong economic development in recent decades with the expansion of industrialization, escalation of technology development, and an improvement in human well-being. Massive economic activities have deteriorated environmental quality with high emissions of hazardous pollutants such as CO2, NOx, and SO2. The region of Asia is becoming the primary source of greenhouse gas emissions worldwide. Asian region's proportion of global GHG emissions has increased two-fold from 22% in 1990 to 44% in 2019 (Asian Development Outlook 2023). CO2 has been widely recognized as the main source of pollution, Asian region contributing about 60% of worldwide CO2 emissions (Ritchie and Roser, 2020, revised 2024). Thus, immediate action is needed to reduce CO2 emissions from Asian countries.

Yet there is still doubt about how such rapid economic expansion would affect ecological sustainability. Scholarly discourse regards the relationship between environmental quality and economic growth as a framework for evaluating a nation's sustainability. EKC posits that economic growth and environmental pollution have an inverted U-shaped relationship. It expresses that environmental quality falls as pollution emissions rise, at the early phases of economic development, but it subsequently declines when economic growth reaches a certain threshold.

Innovation has been commonly recognized as the main factor accelerating sustainability. Innovations increase economic productivity and lessen the environmental effect of manufacturing processes by promoting technical advancement. Promoting technical innovation has become a generally acknowledged solution to address environmental issues like carbon dioxide emissions (Cheng et al., 2021) especially in emerging countries (Nazir et al., 2018). The carbon footprint connected with economic activity is often reduced by using more energy-efficient solutions that are produced by innovative technologies and processes (Menash et al., 2018). Generally, past studies have evidenced that technological innovation can help lower CO2 emissions and enhance the quality of the environment (Gerlagh, 2007; Ang, 2009; Amin, 2020; Luo et al., 2021; Khan, 2023). Still, some studies found an insignificant or positive impact of technological innovation on CO2 emissions (Cheng et al., 2019a; Cheng et al., 2019b; Rahman & Alam, 2023).

Technological innovation in environmental-related technologies improves the environment quality by increasing energy efficiency, decreasing fossil fuel energy consumption and usage of green energy (Chen & Lee, 2020; Shabir, 2023). Environment-related technology innovation is more effective than traditional technological innovation in improving the environment (Dong et al., 2022). Environmentally friendly

technologies could increase production productivity (Shabir, 2023), prevent climate change, promote green economic growth, and effectively reduce CO2 emissions (Zhang et al., 2016; Dong et al., 2022). Environment-related technology innovation likely improves energy efficiency and lowers CO2 emissions. As one of the high energy consumption regions in electricity consumption governments of Asian countries face great challenges in decarbonizing the power industry without sacrificing energy security while meeting the growing electricity demand (Economist Intelligence Unit, 2022). Asian countries have taken positive energy transition and decarbonization strategies to achieve carbon neutrality such as Thailand's Renewable Portfolio Standard, Singapore's Green Plan 2030, Malaysia's Green Technology Master Plan 2017-2030 and Vietnam's Power Development Plan. Thus, there is a need to investigate the impact of renewable energy consumption on environmental degradation in Asian countries. Yet the empirical findings on the impact of renewable energy consumption on CO2 emissions were debatable, some found positive effects (Bekun et al., 2019) and some found insignificant relationships (Rahman & Vu, 2020;).

To enrich the body of current literature, this study examined the impact of technological innovation and renewable energy consumption on CO2 emissions in emerging Asian countries. There is a lack of studies in emerging Asian countries on the relationship between technological innovation and CO2 emissions. Furthermore, this paper applies the EKC hypothesis and STIRPAT model to test the impact of technological innovation and renewable energy on CO2 emissions and the validity of the EKC hypothesis by incorporating the quadratic term of per capita income in the model.

2. Literature Review

Technological Innovation and CO_2 Emissions: Kumar and Managi (2009) revealed that technological innovation reduces carbon emissions in developed nations and raises them in developing nations. Luo et al. (2021) examined the effect of technology innovation on CO2 emission in a panel of Asian countries from 2001 to 2019. Their estimated results showed that technology innovations reduce CO2 emissions and the validity of the EKC hypothesis. They recommend renewable energy sources as a primary energy source and encouraging energy-efficiency improvements to lower CO_2 emissions in Asian economies.

By applying the STIRPAT model on a panel of 13 Asian countries, He et al. (2023) examined the dynamic relationship between technology innovation, urbanization, trade openness and economic growth for the period of 1983-2019. The FMOLS analysis results support the negative relationship between technology innovation and CO2 emissions while the panel cointegration indicates a bidirectional causality relationship between these two variables. Similarly, Amin et al. (2020) findings also support that technological innovation reduces CO_2 emissions and bidirectional causality in the long run for a panel of 13 Asian countries.
Saqib et al. (2023), using the panel quantile regression method, demonstrated the significant impact of technological innovation and renewable energy on CO2 emissions in OECD countries, supporting the Environmental Kuznets Curve (ECK) hypothesis of an inverted U-shaped relationship between economic growth and CO2 emissions. Their findings also highlighted the importance of technological innovation in moderating the effects of renewable energy and economic growth.

Mehmood et al. (2023) employed cross-sectionally augmented autoregressive distributed lag (CS-ARDL) and wavelet coherence techniques to explore the relationship between CO2 emissions, energy consumption, GDP, renewable energy consumption, and technological innovations in G-7 countries from 1990 to 2020. Their results showed that while technological innovation has a negative impact on CO2 emissions in the short term, it has a positive effect in the long term. Similarly, Khan et al. (2023) confirmed the significant role of technological innovation in enhancing environmental quality across 35 Belt and Road countries.

Mensah and Salman (2019) investigated the long-run relationship between economic development and innovation and carbon emissions for a panel of 18 developed and developing economies using panel fully modified ordinary least square (FMOLS) and panel dynamic ordinary least square (DOLS). They found that innovation lowers carbon emissions in the G6 economies, yet it increases emissions in the MENA and BRICS regions. Dauda et al. (2021) argued that innovation induces the increase of CO_2 emissions in the early stages of development, but when innovation utilization or diffusion increases, CO_2 emissions start to decrease. Rahman

and Alam's (2023) findings indicate technological innovation increases CO_2 emissions while renewable energy reduces CO_2 emissions in a panel of 47 Asian countries.

By applying spatial econometric analysis techniques, Chen and Lee (2020) investigated the effect of technological innovation on CO2 emissions from 1996 to 2018 across 96 countries. Their findings showed no significant effect of technological innovation in improving CO_2 emissions globally. Technological innovation is found to significantly reduce CO_2 emissions for developed and high-CO_2 emissions countries, but it leads to higher CO_2 emissions for middle-income countries. In addition, the EKC hypothesis was also confirmed in Chen and Lee's (2020) study. With a panel of 18 developed countries, Vietnu-Sackey and Acheampong's (2022) findings indicate technological innovation significantly positively impacts the CO_2 emissions for the overall sample and highly polluted countries but negatively impacts the CO_2 emissions for low-polluted countries. They also support the validity of the environment Kuznet inverted U-shaped hypothesis. Renewable energy is found to be significant in reducing CO_2 emissions for the overall sample and low-polluted countries but not for the highly polluted countries.

Several researchers have attempted to measure the extent of technological innovation by analyzing energy savings and R&D expenditures, along with their impact on carbon dioxide emissions. The relationship between patents and CO2 emissions has been extensively studied, with patent growth frequently used as an indicator of technological innovation. Studies by Álvarez-Herránz et al. (2017), Dong et al. (2020), Hashmi and Alam (2019), Wang et al. (2019), and Wurlod and Noailly (2018) have reached similar conclusions regarding the connection between energy efficiency and CO2 emissions. Additionally, other scholars have explored the dynamic relationships between research and development and CO2 emissions, considering R&D investment as a key indicator of technological innovation trends (Churchill et al., 2018; Fernández Fernández et al., 2018; Petrović & Lobanov, 2020). These findings are important as they highlight the impact of technological progress on CO2 emissions. However, the existing studies have yet to offer a comprehensive analysis of how technological innovation affects carbon emissions.

Economic Growth and CO_2 Emissions: The Environmental Kuznet Curve (EKC) framework has been considerably used to examine the relationship between environmental pollution and economic growth since it was introduced by Krueger and Grossman (1991). According to the EKC hypothesis, as income per capita increases, CO_2 emissions are also expected to increase. However, as income per capita reaches a certain threshold, increases in income per capita continue to lower CO_2 emissions. The relationship between environmental pollution and per capita income is implied by an inverted U-shaped curve. The EKC theory was confirmed by Chen and Lee (2020), Vietnu-Sackey and Acheampong (2022) developed countries, Khattak et al. (2020) for BRICS economies, and Petrovic and Lobanov (2020), and Saqib et al. (2023) for OECD countries, Chontanawat (2020) for ASEAN counties.

Renewable Energy and CO2 emissions: Zhang et al. (2023) examined the effect of renewable energy consumption and non-renewable energy on CO2 emissions in a group of Asian countries from 1975 to 2020. The panel Augmented Mean Group estimated results indicate that renewable energy is significant in reducing CO2 emissions in the long run and N-shaped of the EKC hypothesis. Using the panel quantile autoregressive distributed lag (QARDL) model, Du (2023) found a negative effect of renewable energy consumption on carbon intensity in the long run for a panel of 10 Asian countries. Anwar et al. (2021) findings also support renewable energy consumption in reducing CO_2 emissions. The analysis results of FMOLS on 15 highly renewable energy-consuming countries by Saidi and Omri (2020) revealed the significance of renewable energy in enhancing economic growth and diminishing CO2 emissions.

Rahman and Alam (2022) also support the negative impact of renewable energy on CO2 emissions for 47 Asian countries along with the validity of the EKC hypothesis. Al-Mulali et al. (2016) examined the effect of renewable energy on CO2 emission by Applying the EKC model for seven regions. Their findings indicate that renewable energy consumption improves the environment quality in Central and Eastern Europe, Western Europe, East Asia and the Pacific, South Asia, and the Americas but not significantly in the Middle East North Africa and Sub-Saharan Africa. An increase in renewable energy consumption is found likely to reduce CO2 emissions in western and eastern regions of China along with the confirmation of the EKC hypothesis while insignificant in central regions (Chen et al., 2019).

3. Research Methodology

The STRIPAT model, developed by Dietz and Rosa (1994), extends the environmental degradation framework of the IPAT model (Ehrlich & Holdren, 1971). The IPAT equation, I = PAT, expresses environmental impact through population (P), affluence (A), and technology (T). The STRIPAT equation, expressed in exponential form, is as follows:

$$I=\alpha PATe \quad (1)$$

Where b, c, and d represent the exponent terms of P, A and T, respectively, and eIs the error term. By taking the logarithmic of equation (1),

$$\ln I =\alpha+\beta \ln P +\gamma \ln A +\delta T+e \quad (2)$$

Following the work of Answer (2019) and Ojaghlou et al. (2023), this study defines I as carbon dioxide emissions (CO2), P as urbanization (URB), A as economic growth (GDP), and T as renewable energy consumption (REN). The Environmental Kuznets Curve (EKC) hypothesis suggests an inverted U-shaped relationship between income per capita and environmental degradation, implying that as income rises, environmental degradation initially increases, but after reaching a certain income level, it starts to decline. Based on this, the empirical model in this study is expressed as:

$$\ln CO2it =0+1\ln GDPit+ \vartheta 2\ln GDP2it+ 3\ln PATENTRESit ++4\ln URB it+5\ln REN it+it \quad (3)$$

The quadratic form of per capita GDP in equation (3) indicates the application of the EKC hypothesis of an inverted U-shaped curve with the coefficient of $1 \geq 0$, and $\vartheta 2 < 0$. Furthermore, innovation (PATENTRES) is also incorporated into the model.

This study uses a balanced panel of annual data for seven emerging Asian countries from 1995 to 2020, sourced from the World Bank's World Development Indicators. The variables in equation (3) are: CO2 emissions (in metric tons per capita), GDP per capita (constant 2015 US$), urban population (% of total population), total patent applications by residents, renewable energy consumption (% of total final energy consumption), and the KOF Globalisation Index. The subscript t refers to time, and i refers to country. Details on variable measurement and data sources are presented in Table 1.

Table 1: Variables and Data Sources

Variable	Definition	Source
CO2	CO2 emissions (kilo ton)	World Development Indicators, World Bank Database
GDP	GDP (constant 2015 US$)	
URB	Urban population (% of total population)	
PATENTS	Total patent applications by residents	
REN	Renewable energy consumption (% of total final energy consumption)	

This study applies static panel methods to estimate the impact of explanatory variables on CO2 emissions. The static panel data estimation specifications include Pooled Ordinary Least Square (OLS), Fixed Effect (FE) Model and Random Effect (RE) Model. The static panel estimation equation is expressed as:

$$\ln CO2it =0+1\ln GDPit+ \vartheta 2\ln GDP2it+ 3\ln PATENTRESit ++4\ln URB it+5\ln REN it+i+t+it$$

Where t indicates individual-specific effects and it captures time-specific effects. In the pooled OLS model, it is treated as identically and independently distributed (i.i.d) in which i=0; t=0. The individual-specific effect is treated as constant or fixed in the FE model, whereas the RE model implies that it is drawn independently from some probability distribution.

The selection of the appropriate estimation model among the three static panel models (pooled OLS, fixed effects (FE), and random effects (RE)) is made by applying the Breusch-Pagan LM (BP-LM) test (Breusch &

Pagan, 1980) and the Hausman test (Hausman, 1978). The BP-LM test determines whether the RE model is preferable to the pooled OLS model, while the Hausman test evaluates whether the FE or RE model is more appropriate, with the null hypothesis favoring the RE model over the FE model.

The descriptive statistics of the data are presented in Table 2.

Table 2: Descriptive Statistics

	ln CO2	ln GDP	ln GDP2	ln PATENTRES	ln URB	ln REN
Mean	12.8437	26.9526	728.0540	7.13135	3.7350	3.0973
Standard deviation	1.4871	1.2730	70.1732	2.4552	0.3051	0.8324
Minimum	10.5346	24.9255	621.2805	3.1355	3.0986	0.6729
Maximum	16.2084	30.3132	918.8880	14.1476	4.3459	4.1725

4. Results and Discussion

A static panel data analysis has been used to assess the impact of innovation and renewable energy on environmental quality across a panel of seven developing Asian countries. Table 2 displays the estimated results for the Pooled Ordinary Least Squares (OLS), Fixed Effect, and Random Effect models. The Pooled OLS results show that the coefficients of GDP, GDP^2, and URBAN are statistically significant at the 1% level. To check for an unobserved country-specific effect, the Breusch-Pagan LM test rejects the null hypothesis, suggesting that the Random Effect model is preferable over the Pooled OLS model. Additionally, the Poolability test rejects the null hypothesis, indicating the Fixed Effect model is preferable to the Pooled OLS model. These results suggest that both Fixed and Random Effects models are appropriate, and the presence of a time effect is also confirmed. The Hausman test is then applied to determine whether Fixed Effects (FE) or Random Effects (RE) is more suitable, with the test rejecting the null hypothesis that country-specific effects are uncorrelated with the model's explanatory variables, thus favoring the FE model.

Furthermore, diagnostic checks are performed such as detecting multicollinearity, heteroskedasticity and serial correlation. The rejection of the null hypothesis of homoskedasticity indicates the presence of a heteroskedasticity problem. The serial correlation also indicates the presence of first-order autocorrelation in the data. The heteroskedasticity and serial correlation problem was addressed by performing robust standard errors (as shown in column 8 Table 2).

The results revealed that expected positive and negative signs of the coefficient for GDP and GDP2 are statistically significant at the 1% level. GDP is positively related to CO2 emissions and GDP2 is negatively related to CO2 emissions. This supports the validity of the EKC hypothesis implying an inverted U-shaped relationship between GDP and CO2 emissions. The turning point of the EKC is the long-run elasticity of CO2 emissions about GDP, ∂lnCO2∂lnGDP, Implying 1.229+E14 USD (in 2015 constant values).

The estimated results indicate that innovation has a positive statistically significant effect on CO2 emissions indicating that innovation by residents of the Asian emerging is improving the environment quality with lessening CO2 emissions. A unit increase in innovation by residents of the Asian emerging mitigates CO2 emission by 0.065%. While renewable energy consumption hurts CO2 emissions. 1% increase in renewable energy consumption, CO2 emissions reduced by 0.18% Urban population has a positive effect on CO2 emissions indicating a 1% increase in urban population will increase CO2 emissions by 0.73%.

Table 3: POLS, random effect and fixed effect estimation results with different specification models

dependent variable: (ln CO2 emission **)**	**Pooled OLS**	**FEM**	**REM**	**Pooled OLS**	**FEM**	**REM**	**FEM robust standard errors**
	3.051***	4.111***	4.242***	4.809***	7.916***	5.879***	7.916***
	(0.429)	(0.309)	(0.452)	(0.429)	(0.394)	(0.394)	(0.694)
ln GDP	-0.050***	-0.065***	-0.059***	-0.068***	-0.122***	-0.091***	-0.122***
	(0.008)	(0.006)	(0.008)	(0.008)	(0.006)	(0.007)	(0.013)
ln GDP2	-0.001	0.066***	0.072**	0.065***	0.065***	0.169***	0.065**
	(0.025)	(0.028)	(0.028)	(0.0269)	(0.022)	(0.025)	(0.025)
ln PATENTRES	-0.440	-0.336***	-0.328***	-0.353***	-0.180***	-0.167***	-0.180**
	(0.035)	(0.049)	(0.041)	(0.036)	(0.041)	(0.037)	(0.074)
ln REN	-1.210***	0.261**	-1.045***	-0.020***	0.731***	-0.399***	0.731**
	(0.078)	(0124)	(0.089)	(0.086)	(0.102)	(0.093)	(0.269)
ln URBAN	-51.079***	-	-	-64.191***	-	-	-114.104***
	(5.778)	50.718***	54.357***	(5.801)	114.104***	78.637***	(10.677)
		(4.217)	(6.101)		(6.183)	(0.076)	
constant		70.19***			6.02***	117.36***	
F-test (year dummies)	No	Yes	Yes	No	Yes	Yes	
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	
Year dummies					105.97***		
Poolability F				306.07***			
Breusch-Pagan LM test						98.75***	
Hausman Test					184.97***		
White Heteroskedasticity test							263.98***
Mundlak Hausman							

Notes: Values in parentheses are standard errors. ***, **, and* indicate statistical significance at 1%, 5% and 10% level, respectively.

Discussion

The validation of the inverted U-shaped EKC hypothesis has been confirmed in this study for Asian emerging countries. This is in line with studies done by (Xie et al., 2023; Kosrakis et al., 2023); and (Jiang & Khan, 2022). As emerging Asian economies are heading towards a sustainable path, rapid industrialization causes increased CO2 emissions up to a certain point while economic expansion occurs. Emerging Asian countries highly anticipate the negative environmental impacts by implementing appropriate environmental policies to close the growth-environmental degradation gap.

Estimated results of the positive effect of technological innovation on CO2 emissions for emerging Asian countries are consistent with findings by Jiang and Khan (2022) and Xie et al., (2023) in the short run and long run. Countries with significant CO2 emissions should allocate more resources towards the development and implementation of innovative technologies to mitigate CO2 emissions. Economic innovation, commonly referred to as green technology innovation, facilitates environmental conservation during the development of new products (Petak et al., 2020). Accordingly, the economy can be shifted to a more sustainable source of manufacturing and energy development through innovation.

Transitioning to a cleaner energy mix, specifically by adopting renewable energy sources and technologies, would significantly reduce CO2 emissions. Sustained economic growth may enhance the environment by implementing energy-efficient technology, expanding the use of renewable energy sources and fostering innovation that lowers CO2 emissions (Luo, 2021). The promotion of renewable energy not only yields environmental advantages but also contributes to the economic situation of the country. This is consistent with the findings of this study on the negative relationship between renewable energy consumption and CO2 emissions.

In summary, innovation is a critical driver of environmental sustainability in developing Asian countries. By fostering technological advancements, improving processes, and promoting sustainable practices, innovation can significantly contribute to reducing CO2 emissions. However, to fully harness its potential, supportive policy frameworks and strategies to overcome existing barriers are essential. Continued investment in innovation, along with collaboration across sectors, will be vital for achieving sustainable development goals and improving environmental quality in the region.

5. Conclusion

This study employs static panel data analysis to assess the impact of innovation and renewable energy on environmental quality, specifically CO2 emissions, across seven developing Asian countries. The results from various econometric models—Pooled Ordinary Least Squares (OLS), Fixed Effects (FE), and Random Effects (RE)—provide valuable insights into the dynamics of economic growth and environmental sustainability. The model selection process began with the Pooled OLS approach, where significant positive coefficients for GDP and GDP^2 were observed, affirming the presence of a non-linear relationship between economic growth and CO2 emissions consistent with the Environmental Kuznets Curve (EKC) hypothesis. The Bruesch-Pagan LM test and the Poolability test reinforced the necessity to account for unobserved country-specific effects, leading to the preference for FE and

RE models. Ultimately, the Hausman test indicated that the Fixed Effects model is the most appropriate, as it effectively controls for unobserved heterogeneity correlated with the explanatory variables. Further diagnostic checks revealed issues of heteroskedasticity and first-order autocorrelation. By employing standard errors, the integrity of the estimates was preserved, allowing for more reliable interpretations of the coefficients. Importantly, innovation emerges as a critical factor for improving environmental quality. The positive and statistically significant effect of innovation on CO2 emissions—indicating a reduction of 0.065% for every unit increase—suggests that advancements in technology and processes can significantly contribute to emission reductions. This finding underscores the role of innovation as a pathway to achieve environmental sustainability, particularly in rapidly developing economies. In contrast, renewable energy consumption demonstrates a negative relationship with CO2 emissions. The finding that a 1% increase in renewable energy consumption leads to a 0.18% decrease in emissions highlights the potential of renewable sources in mitigating climate change impacts. This supports the argument for investing in and expanding renewable energy infrastructure in developing regions.

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Boardroom Diversity and Whistleblowing Disclosure: Empirical Evidence from Malaysia's Top 100 Publicly Listed Companies

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Abstract: The disclosure of whistleblowing policies is a critical component of effective corporate governance. High standards of whistleblowing policy disclosure signal a company's commitment to safeguarding stakeholder interests. This research aims to analyze the relationship between board composition and whistleblowing policy disclosure in the top 100 Malaysian publicly listed companies. Specifically, the study investigates whether board independence, board size, the frequency of board meetings, and board gender diversity affect the level of whistleblowing policy disclosure. The relationships between these board characteristics and whistleblowing policy disclosure are analyzed using an Ordinary Least Squares (OLS) regression model. The findings reveal that board independence and gender diversity are significantly and positively associated with whistleblowing policy disclosure. However, board size and frequency of the board meetings do not exhibit significant relationships with whistleblowing policy disclosure. This study has contributed to the existing literature by extending the principal-principal conflict theory to the context of whistleblowing policy disclosure, offering new insights into the governance mechanisms that drive transparency in corporate reporting.

Keywords: *Board composition, corporate governance, disclosure, Malaysia, whistleblowing*

1. Introduction

The need for companies to disclose whistleblowing policies has grown relatively essential recently. Therefore, the decision to bring these policies to light depends on the voluntary conduct of the management. These policies are meant to shield employees who report wrongdoing in organizations, and depending on the country, they may be implemented diversely. The United States of America, the United Kingdom, and Australia require organizations to declare their whistleblowing policies, making them a vital component. This requirement has increased ethical practices in organizations and has benefited the public (Sharma et al., 2018). Many reporting issues are associated with fraud, corruption, and abuse of power. On the other hand, countries like Japan and India do not have legislated whistleblowing procedures; they integrate the regulations into the codes of ethics or contain special rules regarding the issue (Sharma et al., 2018). Likewise, whistleblowing is encouraged in Malaysia but not mandated (Ahmad et al., 2018). This comparison illustrates the various regulations regarding whistleblowing and the general social attitude toward its efficiency in creating an ethical business climate. Appreciating these differences enriches existing whistleblowing measures and guarantees affirmative whistleblower protections internationally (Ahmad et al., 2018).

In Malaysia, although the whistleblowing disclosure policy is non-mandatory, the country does not deem it a benchmark in corporate governance. To some extent, the absence of powerful formal mandatory policies can be explained as cultural approaches to whistleblowing and general ignorance about those policies. In addition, a lack of an enforcement mechanism is a challenge to implementing the above policies. For this reason, the effectiveness of whistleblowing policies in the context of Malaysia is subject to debate. The Whistleblower Protection Act (WPA) 2010 does not protect employees who report their concerns within the organization, and the government does not fully apply this law (Bakar & Mangsor, 2022). This state of affairs erodes confidence in legal safeguard provisions for whistleblowers, a key driver of organizational responsibility and transparency. Furthermore, while Malaysian companies are aware of imbalance when compared to financial reports, there is no consistent format for whistleblowing policy disclosure (Ahmad et al., 2018). To fill these gaps, it is important to know why these gaps exist and, more importantly, why there seems to be a lack of adequate protections for whistleblowers as well as ensuring that companies provide full details of their policies on whistleblowing to encourage whistle-blowers to come forward (Saha & Kabra, 2020). The study at different levels revealed

potential factors influencing whistleblowing policy disclosure. At the country and industry levels, factors like regulatory environment and industry practices dominate (Mohamed et al., 2015; Salleh et al., 2019). In the case of voluntary disclosure, board factors such as frequency of board meetings, board size, board independence and board gender diversity matter as shown in the firm-level investigations (Alyousef & Alsughayer, 2021; Bravo & Alvarado, 2018).

The motive for conducting this research is to seek to advance the literature on corporate governance and whistleblowing policy disclosure in light of these emerging methodological concerns and shifts in the literature. It was also found that board attributes have a strong relationship with disclosures made by Malaysian firms regarding whistleblowing policies. Whistleblowing, being one of the many corporate governance practices, enjoins the power of oversight from the board of directors. These are board policies where aspects like independence, diversity, expertise, and leadership quality define how these are implemented. Having a balance of board experience contributes to portioning responsibilities, leading to a proper whistleblower culture. In most cases, enhancing board management best practices, including training and effective communication, could help enhance the functionality of the whistleblowing system, turning it into crucial organs that support ethical practices in business. For instance, diverse, independent, and those who meet frequently are observed to be more transparent and ethical in organizational decision-making (Alyousef & Alsughayer, 2021; Bravo & Alvarado, 2018).

Agency theory helps explain the association between board changes and whistleblowing policy disclosure. This theory postulates that because of conflicts of interest, the agents-i.e., the management- are likely to defraud the principals- i.e., the shareholders. These problems, therefore, can be managed through the board of management and directors' governance to harmonize the interests of the management and shareholders. More so, board characteristics that facilitate organizational monitoring minimize the chances of unethical actions that are not reported. In essence, setting the right ethical tone helps create a positive climate within which whistleblowers can operate to help organizations accomplish the goal of reducing fraud and other malpractices. They are important to the current discourse on corporate governance and whistleblowing, for they extend the discussion on policy disclosure and expand the understanding of its dimensions, following suggestions for further empirical studies by Makri et al., 2024.

Whistleblowing has, therefore, taken a central role in becoming an important factor in corporate governance frameworks, whose major objective is to fight malpractices and unethical practices in organizations. These policies demonstrate how the employees are supposed to come forward with evidence of unethical or unlawful conduct within the organization, which will also protect them from demoralization, whereby they suffer for doing the right thing. Nevertheless, the effectiveness of the policy on whistleblowing depends on the extent to which this policy is disclosed and communicated to stakeholders in the organization, such as the company's employees, in this particular case. Therefore, it is possible to define the factors that affect companies' disclosure of such policies to achieve the disclosure characterized by comprehensibility by each person.

Problem Statement

The issue arises in Malaysia also because the regulations for whistleblowing are selective, and protection would not be given under the Whistleblowing Protection Act (WPA) 2010 when disclosure is made internally (Bakar and Mangsor, 2022). However, the legislation most recent in Malaysia to address whistleblowing is the Whistleblower Protection Act of 2010(WPA 2010). Unfortunately, this outcome occurs because employees may want to report unethical practices within the organization. Also, whether directors or managers, organizational leaders do have a preference for internal whistleblowing. They help strengthen the odds of the information about misconduct remaining rope-bound in the organization, where the vice may be corrected rather than reach the public domain (Kalyanasundram, 2018). Hence, the right environment with an efficient whistleblowing procedure must be created within organizations so that employees are willing to report corruption, fraud, or wrongdoing (Rachagan & Kuppusamy, 2013). Currently, probably the most obvious conclusion that scholars have made is that whistleblowing is an effective means of identifying different sorts of malpractices and fraud in a company. The strength of the Malaysian culture does look to be going a long way towards actively discouraging whistleblowing, along with the strength of the regulators and having both publicly listed companies and their make-up. Chia et al. (2020) noted that public-listed companies are very common in Malaysia; the shareholding in these companies is also mainly centralized. Malaysians are, therefore,

unlikely to report any illicit process in these firms (Rachagan & Kuppusamy, 2013). Apart from that, it was also found that an effective whistleblowing policy may be decided by the board of directors, by their duty of developing company policies.

2. Literature Review

Agency Theory

In Malaysia, the cost of poor corporate governance is heavily borne by the minority of shareholders, which are emerging markets where families own many publicly listed companies. In Malaysia, the problem is that the capital structures are concentrated ownership, so agency conflict arises between the principal-principal relationship between majority and minority shareholders. Concentrated ownership helps in mitigating the traditional agency problem, but it produces a new agency problem between the minority and the majority. Arslan & Alqatan (2020) stated that in Malaysia, expropriation of minority shareholders' rights by majority shareholders often occurs, particularly in party transactions in which majority shareholders can use the vote and their power to obtain personal benefits in various ways to reap the private benefit of minority shareholders. Thus, many researchers have strove to find ways to reduce the agency conflict. It is believed that agency conflict can be reduced by controlling and monitoring the company's internal controls, which is achieved through strong corporate governance. The role of board diversity, including gender diversity and independent directors, is essential for addressing principal-principal conflicts. The boards formed by the diverse members are also expected to provide more diverse inputs and outputs of boards that are inclined more towards the diversified number of stakeholders. Furthermore, greater board-level diversification could improve oversight or act as a check, too, given that the increased board-level diversification may ease off dominant shareholders or the management. It is particularly noteworthy that some boards may be more attuned than others to public and ethical reporting questions, particularly concerning the whistleblower disclosure policy. One good way to prevent agency conflict from arising is by maintaining a good level of whistleblowing policies. Thus, good corporate governance and high whistleblowing policies will help the company reduce the agency problem.

Whistleblowing Policies Disclosure

Whistleblowing research has been quite predominant in recent years, with studies assessing whistleblower intentions (Hadli et al., 2023; Rahman et al., 2023; Rashid et al., 2023; Yusoff et al., 2023). However, by looking at whistleblowing from various angles, the spectrum of this field can be expanded. In this regard, the area of whistleblowing policy analysis has risen in popularity recently. Though there have been studies on whistleblowing policy, the amount of empirical data is not as comprehensive as whistleblowing intentions. More whistleblowing policy disclosures indicate that a better internal control system has been implemented (Zakaria et al., 2020). Whistleblowing policies are essential as a primary internal control mechanism for preventing corporate malpractice. When someone wants to speak up about wrongdoing, he will feel secure and know to whom, how, and which procedure or form needs to be submitted. He also knows that he will not be retaliated against. He is doing the right thing to avoid the next bad thing from happening in the company, such as an ill reputation or corruption that will put the company in danger (Mahmud et al., 2024). In their doctrinal legal research, Mohamed et al. (2015) employed a comparative approach to explore and examine protection for whistleblower employees under the common law in Nigeria and Malaysia. It is found that any government that aspires to be a top player in the global economy needs to ensure that, among other things, its labor laws, practices, and policies can draw foreign and local investors due to their effectiveness, efficiency, and robust nature. However, the study is only doctrinal legal research and did not study the policy and protection of Malaysian or Nigerian companies. Malaysia has legislation but no stringent enforcement; it is voluntary in Malaysia. Despite the introduction of the Whistleblower Protection Act 2010 (the Act), whistleblowing in Malaysia still rarely occurs.

There is also an absence of standardized guidelines on policies for whistleblowing. In their research, Salleh et al. (2019) stressed that five of the ASEAN countries, including Malaysia, the Philippines, Thailand, and Indonesia, all lack the quality of whistleblowing disclosure and have no uniform implementation. Singapore, however, does not fall into this category. Ahmad et al. (2018) and Kalyanasundram (2018) found no exact standard guideline for whistleblowing policy disclosure in Malaysian companies. Almost all publicly listed firms (93.14%) have implemented their own Whistleblowing Policy, which ensures that the MCCG's best practice of encouraging firms to be accountable and transparent to the public is followed (Ali et al., 2023). However,

whistleblowing policies are disclosed better in larger companies. In the Malaysian context, some studies have several shortcomings in terms of whistleblowing policy disclosure. Firstly, prior studies examined potential individuals's whistleblowing intentions but did not go in-depth on the disclosure level of whistleblowing policies. Many previous studies predicted whistleblowing intentions (Hadli et al., 2023; Rahayu & Astuti, 2023; Rahman et al., 2023; Rashid et al., 2023; Yusoff et al., 2023). On the contrary, there has been a lack of research concerning whistleblowing policy in Malaysia. Abidin et al. (2019) and Al-Absy et al. (2019) only discussed the box-ticking method and whether it has a whistleblowing policy. Kalyanasundram (2018) focused on whistleblowing policy effectiveness in their research and analysis of board characteristics and their influence on whistleblowing policy efficacy. The results may also be subject to social desirability bias since the responses were based on internal auditor perceptions regarding the whistleblowing policy in the company. Ahmad et al. (2018) conducted a study on the level of whistleblowing policy disclosure in more detail by using Standard Australia 2003. The study sample is among the top 50 Malaysian public-listed companies. However, the study's simplified sampling approach resulted in biased outcomes, and it did not consider the characteristics of corporate governance. As of now, the relationship between board characteristics and whistleblowing policy disclosure is still underexplored.

Board Independence

One of the most crucial components of the company's structure is the concept of a board of directors aimed at providing a board of directors comprised only of non-executive directors. Malaysia's focus on increasing board independence has been used to enhance the quality of information disclosed to the public. This is because such directors are not full-time employees and have no executive role in the company. Thus, they will surely be able to serve the best interests of the shareholders. According to the latest MCCG 2021, Bursa Malaysia introduced a listing requirement for independent directors with a maximum term of twelve years without any possibility of an extension. This ensures that the company maintains an independent view of the company's operations and benefits from having an independent board of directors representing shareholders. A study conducted by KPMG Malaysia established that 77% of Malaysian companies, which had more than 50% of independent board members, had a formal whistleblowing policy in their organizations (Abidin et al., 2019). This means that there is a positive relationship between board independence and the whistleblowing mechanisms that can enhance corporate governance.

There have been mixed outcomes concerning the impact of independent directors on voluntary disclosure. Of the above works, some agree with the predicted impact of independent directors on company disclosure, as Khanchel and Bentaleb (2022) assert that adopting independent directors will greatly influence voluntary disclosure, not only for the benefit of shareholders but also to safeguard their reputation. They believe that independent oversight is superior to internal monitoring and more effective in providing transparency. Also related to this view, Boateng et al. (2022) stated that firms with a greater proportion of independent directors place a significant value on voluntary disclosures to ensure that transparency is maintained and investors' confidence is protected. Board independence also has a positive effect on whistleblowing policy disclosure; according to the studies by Amalia et al. (2022), Cahaya & Yoga (2020), and Vadasi et al. (2021), they believe that the fact that a firm has independent directors does not translate into enhanced disclosure practices. This might result from the influence of the company's executive director. The interaction between board independence and voluntary disclosure in Malaysia is complex, with numerous factors that affect the results, including the regulation of companies in Malaysia, the standards, and the cultural factors of Malaysian organizations. The relationship between managerial ownership and independent directors can be explained with the help of agency theory. The agency theory assumes that there is always an agency cost due to the conflict of interest between the manager and the shareholder. Managers are thought to act against the shareholders' interests since the two parties have opposing goals of profit maximization, and this conflict is addressed through independent directors (Jensen & Meckling, 1976). Since independent directors are also free from management influence, they can look into the matter more objectively and press for adequate voluntary disclosures. These studies indicate that firms with more independent directors are more inclined to provide voluntary disclosures to increase transparency and confidence in the firm among investors (Khanchel & Bentaleb, 2022). Therefore, it can also be concluded that board independence plays an extremely positive role in voluntary disclosure in Malaysia, based on agency theory. These inconsistent findings illustrate that the relationship between board gender diversity and disclosure is inconclusive. These studies led us to develop the following research hypotheses:

H1: There is a significant positive relationship between board independence and whistleblowing policy disclosure level.

Board Size

A board's monitoring ability and how it is affected by board size have been previously discussed. As one of the mechanisms of corporate governance, board size has been the subject of attention from regulators, academicians, and others in recent years. The total number of directors sitting on the board refers to board size (Makri et al., 2024). In the corporate governance of Malaysian companies, board size is a crucial determinant. There are many advantages and disadvantages to either large or small board sizes. According to several studies, some advantages of small boards are that they are more effective because they are easier to coordinate and tend to be more effective, as well as to avoid free riders or sleeping directors and indeed ensure less coordination cost (Ismail et al., 2020). If there are small boards, it is easy to get the same word or make a decision in a company. Thus, it will benefit the company to install policies, such as whistleblowing policy decisions, and reduce the time to implement them to avoid difficulties in the company. Small boards also avoid free riders who are only being paid as directors but are not responsible for monitoring company operations. Meanwhile, the advantages of larger boards are essential to providing valuable resources to the company and various knowledge (Badru et al., 2019; Nyambia & Hamdan, 2018). Larger boards also provide effective monitoring of top management's behavior by reducing CEO dominance in the decision-making process (Ismail et al., 2020). In addition, a large board size will support and give more effective advice to the company's management due to the complexity of the business environment and the organization's culture and gather much more information (Alyousef & Alsughayer, 2021).

More so, the issue of board size has been an area of discussion in voluntary disclosure. Based on the prior literature, some studies postulated a significant positive correlation between voluntary disclosure and board size. For example, in a study that examined the influence between voluntary disclosure and board size, it was found out there was a significant positive correlation regarding their evidence on the link between voluntary disclosure and corporate governance (Cahaya & Yoga, 2020). Likewise, in his studies, Kalyanasundram (2018) concluded that the size of the board influences policy disclosures of whistleblowing, provisions of hotlines, implementations of anti-misconduct policy and application pressure to improve whistleblower system, the financial behavior and perception of whistleblowing. On the other hand, several prior research has also presented evidence of the negative linkage between voluntary disclosure and board size. For instance, according to Dao & Ngo (2020), the correlation between firm performance and board size was negative in the case of the US. In addition, Fooladi & Farhadi (2019) found that boards of increased size have a more ceremonial function; therefore, they are not very efficient in the managerial process. Sofi & Yahya (2020) also found a negative correlation between board size and accounting performance. Therefore, these variations of results indicate that the relationship between voluntary disclosure and board size is inconclusive. From the above reviews, it is also clear that there is still a lot of controversy surrounding the effect of board size on board effectiveness. Such contradictory results prove that the influence of the board's gender diversity on disclosure is still questionable. These studies led us to develop the following research hypotheses:

H2: There is a significant positive relationship between board size and the whistleblowing policy disclosure level.

Board Meeting

The board of directors is in charge of making critical decisions in a company and is therefore regarded as a critical corporate governance mechanism. More frequent meetings may demonstrate that boards review and monitor such policies more often and appropriately act on issues reported in the whistleblowing system. The board ensures that they pursue the best interests of the firm's shareholders and supervises and advises every decision made by managers, according to some suggestions (Sofi & Yahya, 2020). The time by which directors submit their monitoring activity level can be proxied by the frequency of meetings (Pernamasari, 2018).

However, as the previous mechanisms have shown, there are differing opinions about whether board meetings improve financial results and disclosures. According to agency theory, the more conscientiousness the board exemplifies in carrying out its duties, the more power it will have. Some studies have found a positive link between voluntary disclosure and board meetings. For instance, Khaireddine et al. (2020) studied a sample of 82 companies listed on the French Stock Exchange. The research findings showed that board meetings

significantly and positively impacted environmental and ethical disclosure and governance. Talpur et al. (2018) examined the link between corporate governance and voluntary disclosure among public-listed Malaysian companies and found a significant positive relationship between board meetings and voluntary disclosures. In contrast, no effect on voluntary disclosure was found in audit committee meetings (Pernamasari, 2018). These mixed findings suggest that the link between board meeting frequency, disclosure, and performance is inconclusive. Based on the above reviews, it can be concluded that the effect of board meetings on board effectiveness remains inconclusive. These inconsistent findings illustrate that the relationship between board gender diversity and disclosure is inconclusive. These studies led us to develop the following research hypotheses:

H3: There is a significant positive relationship between the frequency of board meetings and the whistleblowing policy disclosure level.

Board Gender Diversity

Women on boards represent a wide range of views and experiences, and they expose companies to increased business potential. Indeed, according to many studies, having a female board member is linked to the company's growing relevance. It was reported that in 2022 by the Securities Commission Malaysia's Corporate Governance Monitor, women made up 34% of the individuals appointed to the boards of public limited companies (PLCs), an increase from 23% in 2021. Notably, 80% of these women directors were appointed as independent directors, addressing worries that the requirement for at least one female director would result in the selection of related individuals, like family members. Participation of women on boards for the top 100 publicly listed companies and across all publicly listed companies increased by 12.4% and 8.5%, respectively, from 2016 to 2022. This represents significant progress towards the goal of having at least 30% female representation on boards.

Likewise, Cecchetti et al. (2018) found an empirically meaningful association between the number of female directors and the extent of transparency in corporate social responsibility. Conversely, a Waweru (2020) study based in Sub-Saharan Africa illustrated that corporate governance characteristics, including board gender diversity, the proportion of government ownership, and board independence, are significantly and positively related to business ethics disclosure. In sum, agency theory posits that companies are made more accountable to shareholders and other stakeholders through the best corporate governance practices, which helps diminish managerial opportunism, thus reducing agency costs. A study by Khaireddine et al. (2020) showed a significant positive relationship, where it was found that board meetings and board gender diversity have a significant and positive impact on environmental and ethical disclosure and governance. Kalyanasundram (2018) supports the idea that more gender-diverse boards are found to affect whistleblowing policy disclosures. On the other hand, a study by Cecchetti et al. (2018) found that a board's effectiveness was not significantly impacted by skill or gender diversity on the board. 60 Italian listed and non-listed state-owned enterprises were the samples that formed the base of the empirical analysis. These inconsistent findings illustrate that the relationship between board gender diversity and disclosure is inconclusive. These studies led us to develop the following research hypotheses:

H4: There is a significant positive relationship between the board gender diversity of women and the whistleblowing policy disclosure level.

Firm Size

The capability of a company to achieve better-reported information and higher performance is determined by firm size, as it indicates how adequate a company's resources are to manage investments. Disclosing additional information besides financial information in an annual report is believed to enhance company performance by attracting investors to make better investment decisions and allowing them to evaluate the company (Said et al., 2018). Large firms are likely to follow good governance and better disclosure practices due to better resource availability (Saha, 2022). Larger firms perform better than smaller ones because of their ability to diversify the risk (Khanchel & Bentaleb, 2022) and also have good separation of internal control. Thus, the firm size effect on whistleblowing policy disclosure is that the larger company will surely have enough resources to disclose the whistleblowing policies better and have a proper whistleblowing system in the company.

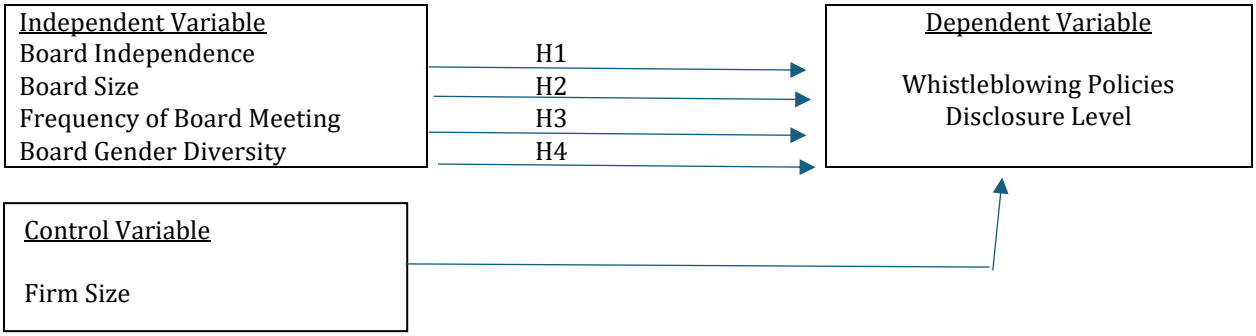
Auditor

Auditor size is seen as a tool to measure the company's audit quality. This means that when the Big Four audits the company, more work has to be done before they come to a conclusion and an opinion on whether the company is disclosing the information in the financial statement with a true and fair view. Research by Peng et al. (2022) found that companies that hire the Big Four as external auditors also perform better in corporate social disclosure. Even a study by Khanchel and Bentaleb (2022) stated that companies that hire the services of Big Four firms tend to disclose more voluntary disclosures. The auditor size of the big four will ensure the company that they audited produces better quality reporting and better whistleblowing policy disclosure than companies that employ a smaller auditor size.

Research Framework

Figure 1 illustrates a research framework depicting the independent variables as indicated by the diversity characteristic. The factors for the board of directors are as follows: independence of the board, size of the board, frequency of board meetings, and gender of board members. Each of these may impact the decision-making process in whistleblowing, thus constituting the dependent variable, which is the disclosure of policies on whistleblowing. Based on the review of previous literature, the figure below shows the proposed research framework.

Figure 1: Research Framework of this study



3. Research Methodology

Malaysian Whistleblowing Policy Disclosure Index

Due to the obvious omission of a Malaysian whistleblowing policy disclosure, the study proposes the development of a self-constructed Malaysian whistleblowing policy disclosure index (WPDI). The crafted index is based on three sources: the guidelines issued by the MCCG (2021), the OECD (2012), and Standards Australia (2003). The process of crafting the WPDI will be carried out in four stages.

In the First Stage: To identify the appropriate disclosure items for whistleblowing policies within Malaysian firms, a content analysis approach will be implemented for each of the three sources of guidelines.

During the Second Stage: The categories and items for the index will be identified and selected. This entailed the selection of the initial items for the index, the categorization of these items, and the subsequent modification of the index as needed.

During the Third Stage: After the initial WPDI checklist is developed, it will be validated by an expert from a regulatory agency, such as the Institute of Internal Auditors of Malaysia or the Malaysian Institute of Accountants, to refine the checklist and ensure its validity.

Finally, in Stage Four: Based on the criteria, a scoring sheet will be provided for each whistleblowing policy disclosure. Disclosures will be obtained from the corporate websites of the corporations and their corporate governance statements in annual reports. The existence of the disclosure will be coded as '1' if it is present and '0' otherwise for each disclosure item.

The scoring procedure was again dichotomous, where an item disclosed received 1, and an item has not received 0. This is in concordance with the quantitative studies done by Ahmad et al. (2018) and with Vadasi et al. (2021) to calculate the index. When rating each index item, they were not weighted to eliminate the element of bias involved in this computation.

Sample selection

This paper uses the characteristics of the board of directors and whistleblowing policy disclosures collected through a content analysis approach. This research used a sample of the companies listed among the top 100 Malaysian publicly listed companies in the main market of Bursa Malaysia as of December 31, 2022. The selection was based on their market capitalization. Besides, the sample under consideration can be more suitable for this study as large firms are likely to maintain good governance and better disclosure practices with good resource availability (Saha, 2022). All finance-related firms, insurance companies, closed-fund banks, and unit trust companies are included in the sample, as the high leverage ratios of financial firms to non-financial firms could skew the results (Salleh et al., 2019). Financial firms also have variant compliance, financial reporting standards and regulatory requirements and frameworks than non-financial firms (Chia et al., 2020). Furthermore, we omit firms not reported on their annual whistleblowing policy, and some firms have missing data points on financial measurement. Year 2022 was chosen as a sample year since the 2022 report was the latest available when conducting this study. Acquiring accurate and timely information is a central concern that affects the validity of the obtained results. Accessing reliable and up-to-date data is critical for ensuring the validity of research findings. Whistleblowing policy disclosures were assessed using the whistleblowing policy disclosure scoring index. As per the requirement, each company's website was visited, and all annual reports were digitally obtained from the website bursamalaysia.com. Table 1 provides the sample selection.

Table 1: Total companies to do content analysis of whistleblowing policies disclosure

Sample selection and elimination procedure	Companies
Total Top 100 Malaysian Public-Listed Companies	100
Elimination	
Financial institution	12
Unavailable whistleblowing policies disclosure	4
Final sample	**84**

Model specification

The following ordinary least square (OLS) regression model is examined in the study:

$$\hat{Y} = \alpha + \beta 0 + \beta 1\ (\text{Independent}) + \beta 2\ (\text{Size}) + \beta 3\ (\text{Meeting}) + \beta 4\ (\text{Gender}) + \beta 5\ (\text{Asset}) + \beta 6\ (\text{Auditor}) + \varepsilon \quad (1)$$

where,

$\hat{Y}$	=	The whistleblowing policies disclosure index is defined as the percentage of the sum of the scores awarded for each item in the WBPD index, for example, the sum of the scores awarded divided by the total number of items in the WBPD Index (maximum score).
Independent	=	Board independence is measured by the proportion of independent directors to total directors on the board.
Size	=	Board size is measured by the natural logarithm of board size.
Meeting	=	The frequency of board meetings is measured by the number of board meetings held per year.
Gender	=	Board gender is measured by the proportion of women directors on the board.
Asset	=	Natural logarithm of total assets.
Auditor	=	Dummy = 1 if audited by big 4 audit firm; 0 otherwise.
β	=	Beta coefficient
ε	=	error term
α	=	estimate of the Y-intercept

The model is structured with corporate governance variables serving as predictor variables, while firm characteristics are included as control variables. Consequently, this study sought to use the predictor variables within the overall arguments, as explained in Section 3. These include the control variables anchored on

literature and related to factors likely to influence whistleblowing policy disclosure. The measures and operational definitions of the variables in the study are captured in Table 2. The collected data was analyzed statistically, and the regression model was estimated using IBM SPSS (version 27).

Table 2: Operationalization of the Variables Measured and Used in the Study

Variables Name	Acronym	Nature of Variable	Measurement	Article	Sources	Sign
Whistleblowing Policies Disclosure Level	WBPD	Dependent Variable	Percentage of the total of the scores awarded for each item in the WBPD index.	Ahmad et al., (2023)	Whistleblowing Policies	+
Board Independent	BIND	Independent Variable	Percent of non-executive directors within the board's total number of directors.	Bitrus et al., (2024)	Annual Report	+
Board Size	BS	Independent Variable	Natural logarithm of board size.	Makri et al., (2024)	Annual Report	+
Frequency Board Meeting	BM	Independent Variable	Numbers of the board meetings held per year.	Makri et al., (2024)	Annual Report	+
Board Gender	BG	Independent Variable	Percentage of female directors about the total number of directors on the board.	Bitrus et al., (2024)	Annual Report	+
Firm Size	SIZE	Control Variable	Natural logarithm of total assets.	Dao & Ngo (2020)	Annual Report	+
Auditor	AUD	Control Variable	Dummy = 1 if audited by a Big 4 audit firm, 0 otherwise.	Dao & Ngo (2020)	Annual Report	+

4. Result and Discussion

Frequency of whistleblowing policies disclosure

Table 3: Frequency of items disclosed in whistleblowing policies

No	Statement	No of companies	Source*
1	A general statement of the organization's dedication to fostering a culture of corporate compliance and ethical behavior.	84	1,2,3
2	A statement ensuring that separate channels of communication are available for both internal and external parties to submit complaints.	53	1,2
3	A detailed outline of the policy's applicability to employees, including contractors and consultants.	78	1,2,3
4	A clear definition of the policy's scope, which includes non-employees such as customers and the general public.	57	1,2,3
5	A statement highlighting the benefits and importance of having a whistleblowing mechanism in place for the organization.	78	1

6	An assurance that all reports will be treated confidentially and handled securely by the law.	79	1,3
7	A guarantee that whistleblowers will receive timely feedback after submitting their report.	46	1
8	A description of the specific protections provided to whistleblowers and the actions that will be taken to safeguard them.	81	1,2,3
9	A detailed explanation of the types of issues and concerns where whistleblowing mechanisms are appropriate.	78	1
10	Clear guidance on whom reports should be directed.	76	1
11	Detailed instructions on the proper procedures for submitting a report.	79	1
12	A commitment to regularly reviewing whistleblowing programs to ensure their ongoing effectiveness.	38	1,2
13	An assurance that there will be no retaliation by the company for reports made in good faith.	81	1,2,3
14	A commitment to appointing and maintaining a qualified whistleblower protection officer who is accessible to all employees.	50	1
15	A statement that the whistleblower will be guided and get advice to report	77	2
16	A statement that the board will review the whistleblowing policy together with the management	3	3
17	A statement that the report can be objectively investigated	3	3

*Note:
1. Checklist recommended by Standards Australia (2003)
2. OECD Whistleblower Protection Report (2012)
3. MCCG (2021)

Table 3 summarises an analysis of the frequency of items identified in the whistleblowing policies of the selected Malaysian Public Listed Companies. The table opined that although the current sample is restricted to the 100 largest companies in Malaysia, they still fail to give adequate disclosure in their whistleblowing policies. Interestingly, four of these firms have no whistleblower disclosures concerning these practices during report preparation. As shown in the figure above, although overall greater than 50% acceptable exposure was given on fourteen (14) out of the total seventeen (17) items, the remaining three revealed items were observed to be less than 50 percent on adequate disclosure components for the remaining 84 firms (refer to the shaded color).

Table 4: Total companies with percentage whistleblowing policies disclosure

No of Disclosure	Percentage of Disclosure (%)	Level Disclosure	Total Company	Percentage
14-17	81-100	5	37	42%
11-13	61-80	4	33	38%
7-10	41-60	3	7	8%
4-6	21-40	2	4	5%
0-3	0-20	1	3	3%
Total Companies			84	100%

*Note: 4 companies do not provide their whistleblowing disclosure at all

Table 4 shows the indexing of the total percentage of whistleblowing policy disclosures. Only 37 firms achieved 14 to 17 disclosures, or 81 to 100% of whistleblowing policy disclosures, whereas 3 of the Top 100 Malaysian publicly listed companies obtained 0 to 3, or 0% to 20%, whistleblowing policy disclosures. This study supports the Minority Shareholders Watchdog Group's (MWSG) findings that the implementation of whistleblowing procedures in Malaysian-listed businesses is weak (Ahmad et al., 2018). A total of two companies completed 17 of the mandatory disclosure items. Also, 77 companies disclose more than 7 or 50% of their whistleblowing policies. This is hardly surprising given that the corporations are among the largest of Malaysia's top 100 publicly listed companies. The largest organizations could indicate that they provide excellent role models for

others. The study also indicated that, unlike developed nations, Asian countries are still in the early stages of implementing whistleblower policies. Meanwhile, in Malaysia, whistleblowing is still in its early stages and is a less preferred method for revealing misconduct in organizations.

Descriptive Statistics

Information on the study's descriptive statistics is covered in this section. The study's independent and dependent variables, means, standard deviations, minimum and maximum values, and the number of observations are all described.

Table 5: Descriptive Statistics

Variables	N	Minimum	Maximum	Mean	Std. Deviation
WBPD	84	1	5	4.11	1.064
BIND	84	0.30	0.83	0.5362	0.12762
BS	84	5	15	9.11	2.151
BM	84	4	19	7.05	3.077
BG	84	0.10	0.57	0.2604	0.10627
SIZE	84	18.65	181.43	16.67	25.9555
AUD	84	0	1	0.75	0.436

Source: *SPSS Output Results (Version 27), 2024.*

The mean WBP level is 4.11, indicating that, on average, companies have a relatively high level of whistleblowing policy disclosure. The whistleblowing policy disclosure range's minimum and maximum values are 1 and 5, respectively. This means that the minimum level of WBPD was 1, signifying a very low level. The standard deviations suggest variability in the data, with the board gender diversity having a mean of 0.2604, highlighting the relatively low representation of women on boards.

Correlation Analysis

The correlation matrix provides insight into the relationships between the different variables. Significant correlations are highlighted as follows:

Table 6: Correlation Analysis

Variables	WBPD	BIND	BS	BM	BG	SIZE	AUD
WBPD	1						
BIND	0.313**	1					
BS	0.132	0.030	1				
BM	0.201	0.207	0.272*	1			
BG	0.241*	0.012	-0.001	0.233*	1		
SIZE	0.177	0.219*	0.266*	0.368**	0.044	1	
AUD	0.006	0.063	0.312**	0.153	0.010	0.172	1

Note: *p < 0.05, **p < 0.01

Source: *SPSS Output Results (Version 27), 2024.*

The significant positive correlation between whistleblowing policy disclosure and board independence ($r = 0.313$, $p < 0.01$) suggests that higher board independence is associated with a higher whistleblowing policy disclosure level. Similarly, the positive correlation between whistleblowing policy disclosure and board gender diversity ($r = 0.241$, $p < 0.05$) indicates that gender diversity on the board is related to greater policy disclosure.

Multiple Regression Analysis

The regression analysis was conducted to determine the impact of board characteristics on whistleblowing policy disclosure. The results are summarized in the table below:

Table 7: Regression Analysis

Variables	Unstandardized Coefficients (B)	Std. Error	Standardized Coefficients (Beta)	t	Sig
(Constant)	1.712	0.720	-	2.378	0.020
BIND	2.359	0.891	0.283	2.647	0.010*
BS	0.055	0.056	.111	0.976	0.332
BM	0.011	0.041	0.032	0.272	0.786
BG	2.358	1.073	0.235	2.197	0.031*
SIZE	3.962E-12	0.000	0.097	0.836	0.406
AUD	-0.170	0.267	-0.070	-0.638	0.525

Note: *p < 0.05
Source: *SPSS Output Results (Version 27), 2024.*

The regression analysis shows that board independence (β = 0.283, p = 0.010) and board gender diversity (β = 0.235, p = 0.031) have significant positive relationships with whistleblowing policy disclosure, supporting Hypotheses 1 and 4. This result is supported by a study by Khanchel & Bentaleb (2022) and Boateng et al. (2022) that found a positive relationship between board independence and the company's voluntary disclosure. Also, board gender diversity has a positive relationship with voluntary disclosure, as supported by Waweru (2020), which illustrated that corporate governance characteristics (including board gender diversity, the proportion of government ownership, and board independence) are significantly and positively related to business ethics disclosure. A study by Khaireddine et al. (2020) also supports the idea that board gender diversity significantly and positively impacts environmental and ethical disclosure and governance. However, board size and frequency of board meetings do not have significant relationships with whistleblowing policy disclosure, thus not supporting Hypotheses 2 and 3. This is because larger boards have a more symbolic role, thus being rather ineffective in the actual management process (Fooladi & Farhadi, 2019). This result supported the study of Dao & Ngo (2020), which found that the relationship between firm disclosure and board size was negative in the US. Also, Sofi & Yahya (2020) found a negative relationship between board size and company disclosure. Meanwhile, the frequency of board meetings was found to hurt voluntary disclosure, supporting the study of Pernamasari (2018), which found no effect on voluntary disclosure from board meetings.

Table 8: Summary of Hypotheses Result

No	Hypotheses	P-Value	Result
H1	There is a significant positive relationship between board independence and the whistleblowing policy disclosure level.	0.010	Supported
H2	There is a significant positive relationship between board size and the whistleblowing policy disclosure level.	0.332	Not Supported
H3	There is a significant positive relationship between the frequency of board meetings and the whistleblowing policy disclosure level.	0.786	Not Supported
H4	There is a significant positive relationship between the board gender diversity of women and the whistleblowing policy disclosure level.	0.031	Supported

The first hypothesis that board independence positively influences whistleblowing policy disclosure is supported (p-value: 0.010). Independent boards are believed to care more for the interests of shareholders by promoting transparency than insiders. They act as a check on the management, reducing possibilities of conflict of interest. Agent costs are minimized by having independent directors overseeing everything being done by managers to ensure they act in the best interest of the shareholders. From the agency theory perspective, such directors are less likely to be influenced by the management and, therefore, more inclined to support measures such as whistleblowing, which targets revealing misconduct. It assists in reducing information asymmetry, but with the help of management, it cannot prevent the disclosure of crucial information (Khanchel & Bentaleb, 2022).

The second hypothesis regarding board size is not supported (p-value: 0.332), indicating no significant relationship between board size and whistleblowing policy disclosure. This implies that effectiveness in disclosing policies on whistleblowing is not determined solely by an increase in the board size. Large boards have been said to be ineffective in decision-making because of the large number of people involved, making it difficult to coordinate. According to agency theory, increased monitoring decreases agency costs; however, the findings imply that the board size does not directly improve governance quality. Perhaps characteristics such as the board's efficiency, interest, and information exchange can matter more than size. A large board may have coordination and communication issues, thus negatively affecting its ability to perform key governance responsibilities such as clarifying the whistleblowing policy disclosure.

The third hypothesis that the frequency of board meetings positively influences whistleblowing policy disclosure is not supported (p-value: 0.786). The result indicates that merely increasing the number of board meetings does not improve whistleblowing policy disclosure. The frequency of meetings may not directly translate to meaningful discussions or action on transparency and governance issues. Although agency theory points out the need to control agency costs, evidence from this research indicates that the effectiveness of a particular governance mechanism depends not on the frequency of the process but on the quality of the meetings. It can be, for example, board meetings where there is no essential discussion of issues regarding governance, such as the policy on whistleblowing. Hence, the kind of change represented by more meetings does not address the problems of information asymmetry or the calls for enhanced management oversight.

The fourth hypothesis that board gender diversity positively influences whistleblowing policy disclosure is supported (p-value: 0.031). The presence of women on boards is associated with greater disclosure of whistleblowing policies. Gender diversity brings diverse perspectives, often fostering a culture of transparency, ethics, and accountability. Agency theory suggests that more effective monitoring mechanisms lead to better alignment between management and shareholders. Gender-diverse boards can act as a stronger oversight mechanism, promoting higher ethical standards and reducing agency costs. Female directors are often associated with stronger advocacy for social responsibility, including promoting whistleblowing policies to ensure transparency and accountability. This diversity helps mitigate information asymmetry by encouraging disclosure practices that make corporate misconduct more visible to shareholders and other stakeholders.

Overall, agency theory can explain why independent and diverse boards are more effective in improving whistleblowing policy disclosure rather than board size and more frequent meetings. They help check and balance between management and shareholders to minimize agency and information asymmetry costs.

5. Conclusion

The study provides useful insights into the factors influencing whistleblower policy disclosure in firms. This study uses data from the top 100 publicly listed Malaysian companies to understand the association between these board characteristics and whistleblowing policy disclosure levels. It becomes essential to find the reason why such disparities in whistleblowing policy disclosure exist, and this is to ensure that the company will disclose the whistleblowing policies in more detail and to ensure the person who wants to whistleblower is confident in the protection given (Saha & Kabra, 2020). A high whistleblowing disclosure level also increases the chance for information about the misconduct to stay inside the organization, where it may be remedied instead of being made public (Kalyanasundram, 2018). The findings emphasize the relevance of board independence and gender diversity in enhancing accountability through improved policy disclosure.

Independent directors, especially female directors, have an important role in improving whistleblower policy disclosure. Peng et al. (2022) found that board gender diversity effectively enhances voluntary disclosure, and female directors are more concerned about the stakeholders, which solves the agency problem. Meanwhile, the board's independence enhances the disclosure (Khanchel & Bentaleb, 2022). This is because the independent director exerts pressure to enhance disclosure to reduce information asymmetry in the companies. Other board characteristics, such as size and meeting frequency, had no significant impact.

These findings indicate that organizations seeking to improve whistleblower policy disclosure should prioritize board independence and gender diversity. We acknowledge that the study has some limitations to consider when interpreting the results. Firstly, the study only focuses on four main aspects of corporate governance, which are board independence, board size, board meetings, and board gender diversity. Other governance characteristics like board ownership, financial expertise, and CEO duality may influence the result of the analysis. Moreover, the study is limited to one year. The data from another year might also affect the relationship's results. Future research should investigate additional board characteristics and potential modifiers to better understand the factors influencing whistleblowing policy disclosure.

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Flavors of Sarawak: Exploring Authentic Home-Cooked Recipes Through A Mobile Application

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Abstract: This project delves into the exploration of authentic home-cooked recipes from Sarawak, presented through a mobile application with augmented reality features. The motivation is to showcase the rich and diverse Flavours of Sarawak's culinary traditions, with a primary focus on ensuring a user-friendly and engaging experience for the audience. Rapid Application Development (RAD) methodology was utilized, which consists of four (4) main phases: Requirements Planning, User Design, Construction, and Cutover. The outcome of the study: it was found that the Flavours of Sarawak mobile application received a commendable average SUS score of 80.4, indicating a strong level of usability and user satisfaction. This score surpasses the threshold for an above-average user experience, reinforcing the application's success in effectively promoting awareness of Sarawak's diverse flavors. The high SUS score also suggests the application's potential to engage users and convey essential information about Sarawak's culinary heritage in an accessible manner. In terms of future work(s), the inclusion of more food models, particularly those showcasing iconic Sarawak dishes like "Kek Lapis Sarawak," aims to attract more users and foster an increased interest in exploring various facets of Sarawak's culinary traditions.

Keywords: *Flavors of Sarawak, home-cooked recipes, culinary traditions, mobile application, augmented reality*

1. Introduction

According to Ting et al. (2017), Sarawak's rich culinary heritage is deeply rooted in its history, where the native groups, influenced by the vast forested areas and pre-independent lifestyles, crafted traditional foods using natural resources like wild game, fish, shoots, stems, leaves, roots, and bark. These culinary treasures, sourced from the forest, have played a pivotal role in shaping the distinctive gastronomic tourism culture of Sarawak. However, as highlighted by Sageng et al. (2020), there is a notable absence of studies validating the cooking processes, techniques, and ingredients employed in Sarawak's ethnic foods. The lack of a standardized approach to preparing Sarawak Ethnic cuisine poses a potential threat to the culinary heritage of each native group, subsequently impacting the state's tourism landscape (Sageng et al., 2020). The culinary treasures, deeply rooted in Sarawak's ethnic communities, are susceptible to alterations and transformations due to the ongoing waves of modernization. While some changes are expected in response to modernization, the concern arises when these changes encompass the entire food preparation and serving system. If such comprehensive alterations occur, they may significantly impact the understanding of traditional cooking methods for the young and later generations (Langgat et al., 2011). The assumption is that a lack of standardized methods may lead to a loss of knowledge regarding the authentic preparation of these dishes among the younger generations.

To preserve the cooking recipes and traditions of Sarawak natives, a mobile application with augmented reality features has been proposed. The home-cooked recipe mobile application has significant potential to make a positive impact on the lives of users. First, it will serve as a library where users can access a wide range of home-cooked recipes, which can inspire them to cook more meals at home and users can prepare healthier meal options. The traditions or methods of cooking also will be provided by the application. This can lead to a healthier lifestyle and can be helpful for people who have dietary restrictions, such as vegans, vegetarians, or those with food allergies. A home-cooked recipe mobile application can provide users with quick and easy recipes that can be made in a short amount of time. This can be helpful for busy parents, students, or working professionals who want to eat healthy meals at home. Furthermore, cooking at home can be a more cost-effective alternative to eating out, but many people may not know how to prepare meals that are both affordable and tasty. A home-cooked recipe mobile application can provide users with recipes that use inexpensive ingredients and help them save money on food preparation.

2. Literature Review

This section provides the literature review of the project related to Sarawak ethnic cuisine, home-cooked recipes, mobile applications, recommended techniques, and existing applications with comparisons related to the study.

Overview of Sarawak

Sarawak, also known as Bumi Kenyalang (Land of the Hornbills), stands as one of the two Malaysian states in Borneo (Langgat et al., 2011). Popular among both Malaysians and international tourists, Sarawak boasts a captivating cultural diversity with over 30 ethnic groups, such as the Iban, Bidayuh, Malay, Melanau, Chinese, Sebob, and Orang Ulu (Attila, 2007; Langgat et al., 2011). In terms of cuisine, each native group in Sarawak possesses a unique culinary treasure, emphasizing the role of food in representing cultural identities, with each ethnic group having its own culinary story (Langgat et al., 2011; Sageng et al., 2020).

Ethnic Food

According to Mohd et al. (2020), some researchers believe that understanding culture, society, and identities can be achieved by looking at food. In this context, food holds significant cultural importance for the different native groups in Sarawak, each having its unique delicacies. Ting et al. (2017) point out that ethnic foods, which come with stories and histories, are now appreciated for cultural reasons rather than just survival. For instance, according to Mohd et al. (2020), the Iban community is known for "tubu" (stems), "tuak" (rice wine), and "pansuh" (bamboo-cooked meat). Similarly, the Melanau people are associated with "tebaloi" (Sago palm crackers), "sagu" (Sago palm extract), and "umai" (raw fish with lime juice). The Orang Ulu community is recognized for "garam barrio" (Highland's salt), "kikid" (broth), "tengayen" (local young leaves), and "urum giruq" (pudding). Additionally, as per Mohd et al. (2020), the Malay population is famous for the "kek lapis Sarawak" (layered cake of Sarawak). However, according to Ting et al. (2017), ethnic food involves everyday food and eating at home, with variations defined by ethnic groups, regions, cultures, and religions.

Mobile Platform

The smartphone, which is today's most iconic product, is equipped with a powerful operating system, storage space, and execution identical to that of a personal computer (Zhang et al., 2019). Mobile app development has grown exponentially since the opening of the iPhone AppStore in 2008 (Elmahdi0 Bourahla & Bourahla, 2020). Since 2008, device manufacturers have created stores for other mobile devices, including Android, BlackBerry, Nokia Ovi, Windows Phone, and more. However, the Apple platform is the only available platform in this project for the mobile application to be developed because the smartphone that will be used to showcase the mobile application is an iPhone which is the device that the developer owns. iPhone with the iOS operating system is one of the most widely used devices in the world (Studiawan et.al., 2022). iOS is developed by Apple, a company that also makes iPhones, iPads, and MacBooks (Taufani et al., 2019). The iOS platform is the world's first and most advanced mobile operating system, redefined and constantly updated to ensure the best possible user experience (Novac et.al., 2019).

Selection of Extended Reality Technique (XR) for Mobile Application

Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR) are three distinct immersive technologies that offer different user experiences and are being considered for this project. Table 1 shows the difference between VR, AR, and MR. For this project, augmented reality is chosen to be implemented. Augmented reality (AR) has emerged as a promising technology to enhance home recipe applications. By overlaying digital content in a real-world cooking environment, augmented reality can provide users with an interactive and immersive cooking experience. AR-enabled recipe apps can offer several benefits to home cooks. First, AR can display step-by-step instructions directly in the user's field of vision, eliminating the need to constantly refer to cookbooks or digital screens. Users can follow instructions hands-free, improving efficiency and reducing the risk of mistakes. Additionally, AR can provide real-time guidance and support. Through object recognition and tracking, augmented reality can identify cooking ingredients and tools, providing relevant information such as nutritional information, alternative ingredient choices, and cooking tips. This feature enhances user knowledge and allows customization based on dietary preferences or restrictions.

Table 1: Difference between VR, AR, and MR

	Virtual Reality (VR)	Augmented Reality (AR)	Mixed Reality (MR)
Environment Description	An entirely generated scene (image and sound) by computer using some headset to immerse in this virtual world and make a feeling the user transport in this world	A merge between real-world objects and computer graphics objects in the same scene using headsets or mobile applications makes a feel that the real world has new elements.	A merge between real-world objects and computer graphics objects in the same scene using headsets or mobile applications makes a feel that the real world has new elements.
Awareness	Rendering the virtual world makes it hard to distinguish between the real world and the virtual world.	Rendered objects can be identified; it's like a floating UI in the real world.	Rendered objects are hard to identify from real objects.
Interactivity	It's users and virtual world interaction only. There is no interactivity between the virtual world and the real world.	The primary interaction between users and virtual objects may have some interaction between the real world and virtual objects.	It is mainly focusing on blending the interactivity between virtual objects, the real world, and user actions.
Remote Collaboration	Remote users can interact with applications using avatar representations.	The primary interaction between users and virtual objects may be some interaction between the real world and virtual objects.	It can be achieved using avatar representations. It also adopts remote interaction with the real world like remote surgery.

(*Source*: Elawady et al., 2022)

AR can also facilitate discovery and recipe discovery. By using augmented reality to visualize dishes before they are prepared, users can preview the final presentation and make informed decisions about their culinary creations. This visual feedback can enhance creativity and inspire experimentation in the kitchen. All in all, augmented reality has the potential to revolutionize home recipe apps by making cooking more accessible, interactive, and fun. With the continued advancements in AR technology, we can expect an increase in the integration of AR into the cooking experience, allowing home chefs to explore flavors, techniques, and cooking adventures.

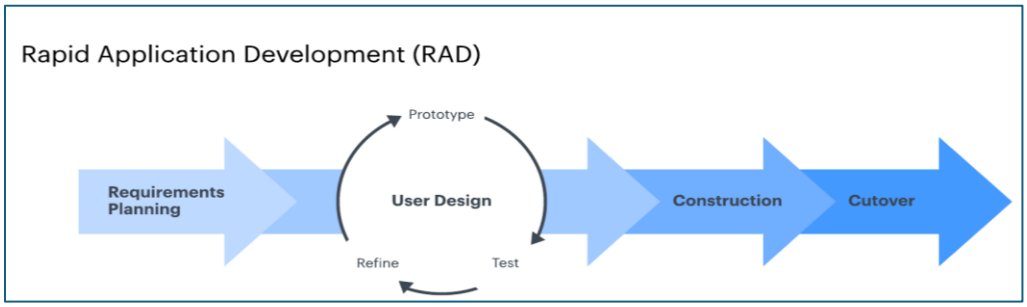
According to Balasubramanian et. al. (2022), the integration of Augmented Reality (AR) and Virtual Reality (VR) as marketing communication channels within the tourism and hospitality industry is gaining attention and momentum to transform and enhance customer experience. The hospitality industry constantly needs to create new experiences in their marketing communication tools compared to traditional video commercials due to the fast-changing world and consumer behavior during the global pandemic and outbreak. In the hospitality and tourism industry, integrating augmented reality and virtual reality will benefit from creating an immersive, healthy, and entertaining experience as it enhances how customers or travellers will access the information in their respective context with the enhanced mobile capabilities (Balasubramanian et. al., 2022). The author hopes that AR products that showcase Sarawak cuisine will be produced more in the coming years.

3. Methodology

Rapid Application Development (RAD) is used as the mobile application development methodology for this project. Rapid Application Development (RAD) is a popular agile project management strategy in software development. The main advantage of the RAD approach is the speed of project execution, making it an attractive choice for developers working in a fast-paced environment such as software development. This rapid speed is due to RAD's focus on minimizing the planning phase and maximizing prototype development. By reducing planning time and emphasizing prototype iterations, RAD enables project managers and stakeholders to accurately measure progress and communicate in real time on progress on issues. Subject or change. This leads

to greater efficiency, faster development, and effective communication. Figure 1 shows Rapid Application Development (RAD) Methodology.

Figure 1: Rapid Application Development (RAD)

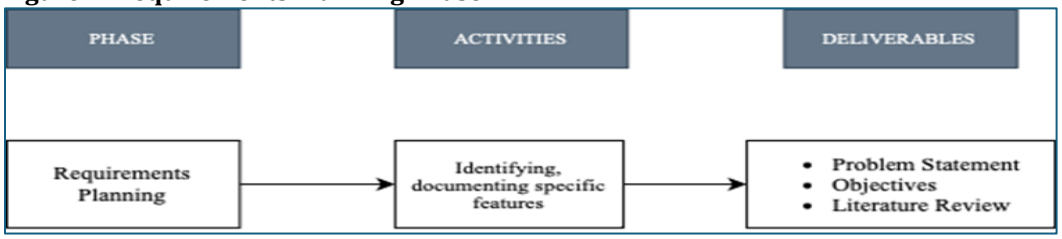


(*Source:* Dennis, 2023)

Description of RAD Phases in Project Implementation
In this section, the RAD phases that have been implemented are described.

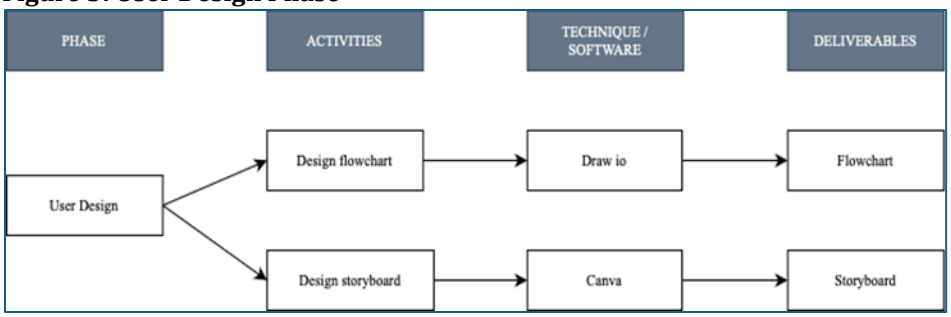
Requirements Planning: Requirements planning for your home recipe project with augmented reality involves identifying and documenting specific features and functions that you want to incorporate into the app. This includes defining the desired user experience, recipe storage, ingredient recognition, nutritional information displays, and interactive cooking demonstrations. By carefully planning requirements, you ensure that the application meets its goals and matches user expectations, facilitating efficient development and successful implementation of real projects. Figure 2 shows the process involved in the requirements planning phase.

Figure 2: Requirements Planning Phase



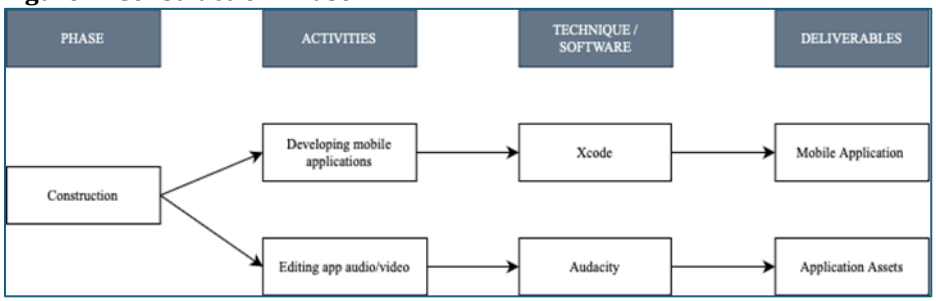
User Design: The user design phase consists of prototypes, refining, and testing. Designers create storyboards, flowcharts, prototypes, and models to visualize an application's structure, layout, and interactions. It also applies intuitive design principles to ensure a consistent and aesthetically pleasing user interface. The design phase allows the user to test and refine the design to implement the final design, ensure AR features are effectively integrated, improve usability, and provide a pleasant dining experience. Overall, storyboards and flowcharts are among the major design presentations created during this phase. Figure 3 shows the process involved in the user design phase.

Figure 3: User Design Phase



Construction: The phase of building your homemade recipe project with augmented reality goes through the development and implementation of the real-world app. In this phase, the software is built to the defined requirements and design specifications. Developers write code, integrate the necessary ingredients, and create augmented reality features like ingredient recognition, recipe displays, and interactive cooking demonstrations. Figure 4 shows the process involved in the construction phase.

Figure 4: Construction Phase



Cutover: The cutover phase is when the final product is ready for deployment. The finished product of this project will be tested by users from the stated project scope. User feedback is very important for improvement to make the app work as expected. Therefore, a questionnaire related to the mobile app experience will be collected. The System Usability Scale (SUS) proposed by Brooke in 1986 is a widely used questionnaire to assess the usability of a system, such as an operating system-based software interface. Standards, web, and mobile applications (Sevilla-Gonzalez et al., 2019). Figure 5 shows the example of The System Usability Scale (SUS).

Figure 5: The System Usability Scale (SUS)

	The Computer System Usability Questionnaire Version 3	Strongly agree 1	2	3	4	5	6	Strongly disagree 7	NA
1	Overall, I am satisfied with how easy it is to use this system.	○	○	○	○	○	○	○	○
2	It is simple to use this system.	○	○	○	○	○	○	○	○
3	I am able to complete my work quickly using this system.	○	○	○	○	○	○	○	○
4	I feel comfortable using this system.	○	○	○	○	○	○	○	○
5	It was easy to learn to use this system.	○	○	○	○	○	○	○	○
6	I believe I became productive quickly using this system.	○	○	○	○	○	○	○	○
7	The system gives error messages that clearly tell me how to fix problems.	○	○	○	○	○	○	○	○
8	Whenever I make a mistake using the system, I recover easily and quickly.	○	○	○	○	○	○	○	○
9	The information (such as online help, on-screen messages, and other documentation) provided with this system is clear.	○	○	○	○	○	○	○	○
10	It is easy to find the information I needed.	○	○	○	○	○	○	○	○
11	The information provided with the system is effective in helping me complete my work.	○	○	○	○	○	○	○	○
12	The organization of information on the system screens is clear.	○	○	○	○	○	○	○	○
13	The interface* of this system is pleasant.	○	○	○	○	○	○	○	○
14	I like using the interface of this system.	○	○	○	○	○	○	○	○
15	This system has all the functions and capabilities I expect it to have.	○	○	○	○	○	○	○	○
16	Overall, I am satisfied with this system.	○	○	○	○	○	○	○	○

**The "interface" includes those items that you use to interact with the system. For example, some components of the interface are the keyboard, the mouse, the microphone, and the screens (including their graphics and language).*

(Source: Barnum, 2020)

4. Results and Discussion

In this section, the overall results of the mobile application design, development, and testing are discussed. The project's efficacy was guaranteed through a step-by-step approach, starting from requirement analysis to evaluating the final product during development and implementation.

Mobile Application Design and Development

It's crucial to precisely define and understand all the components related to the initial work to ensure developers have the right tools and resources. For the development of this mobile application, it's essential to use suitable hardware to ensure a smooth process and prevent complications. Additionally, it's recommended to utilize the developer's latest hardware to expedite the development process and avoid unnecessary loading delays. Table 2 shows the hardware requirement for this mobile application and Table 3 shows the software requirements for the application.

Table 2: Hardware Requirement

	Feature	Requirement
1	Device	iPhone 12
2	iOS Version	17.0.3
3	Memory	128 GB

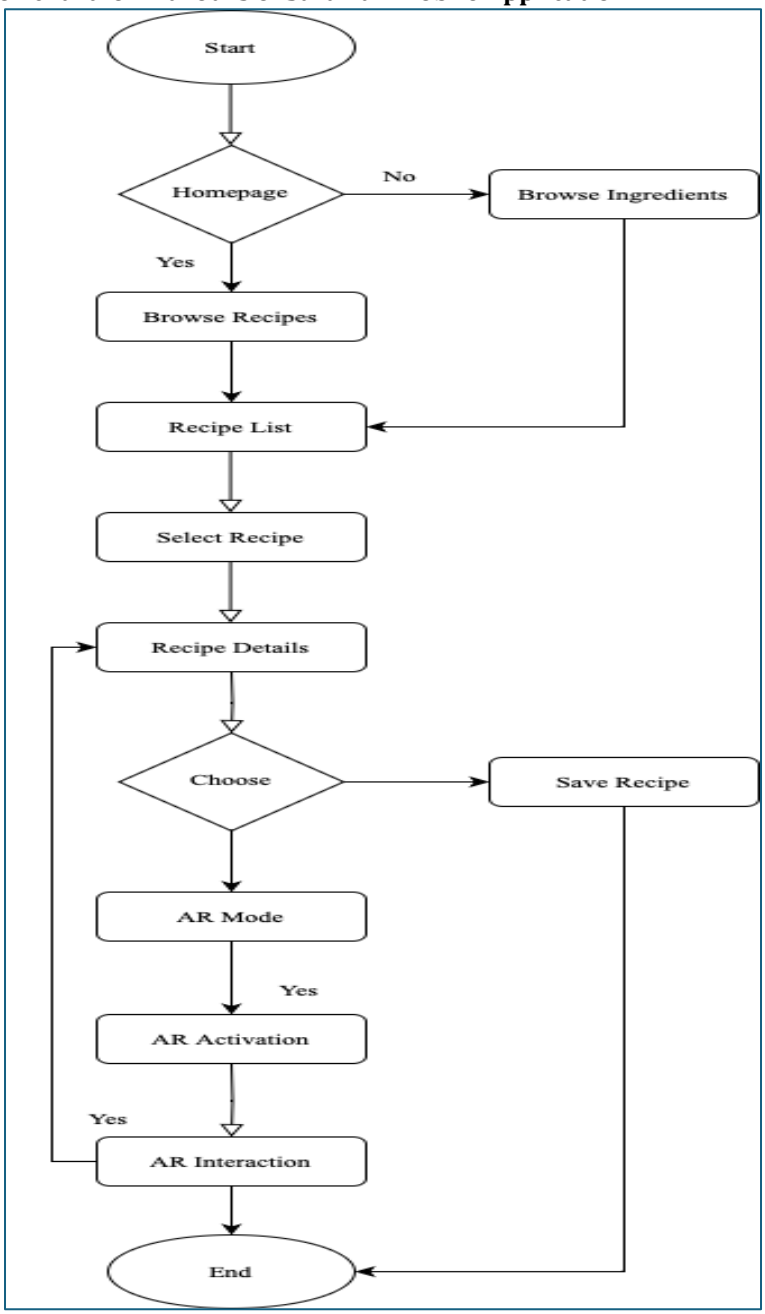
Table 3: Software Requirements

	Software	Description
1	XCode	To develop an iOS mobile application
2	Blender	To create the augmented reality 3D
3	Reality Converter	To convert, view, and customize USDZ 3D objects on Mac
4	Canva	To design the launch screen for a mobile application

Mobile Application Process Flowchart

Figure 6 is the process flowchart for the Flavours of Sarawak Mobile Application. It encompasses 9 processes, and 2 decisions to cover its recipe information management and augmented reality features.

Figure 6: Process Flowchart for Flavours of Sarawak Mobile Application



Mobile Application Storyboard

The storyboard has a dual role: building the app interface and guiding developers in the development process. It's been improved from the earlier low-fidelity version, offering a user-friendly overview and visual representation of the app's potential appearance. The storyboard depicts application functionality, with each scene showing the layout and operations. Figure 7 – 13 shows the storyboard of the project.

Figure 7: Launch Screen

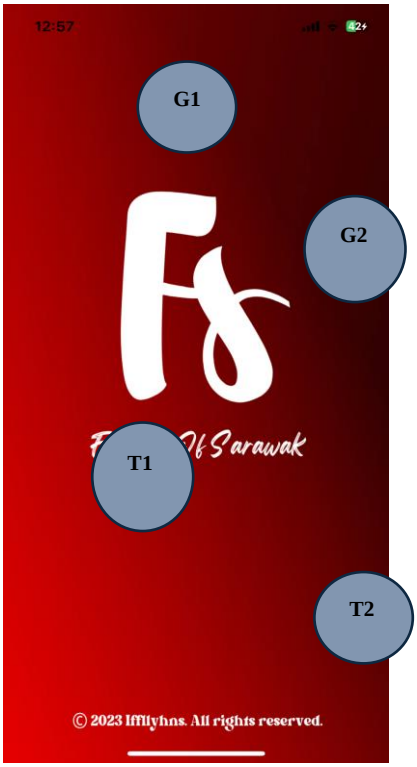
Scene 1: Launch Screen

Description
When a user clicks the application, this launch screen will automatically appear for a few seconds before it brings you to the Main Home page.
Multimedia Elements
T (Text), G (Graphic), A (Animation), S (Sound), B (Button)
T1: Title **T2: Credit Title** **G1: Background Image** **G2: Logo Image**

Figure 8: Main Home

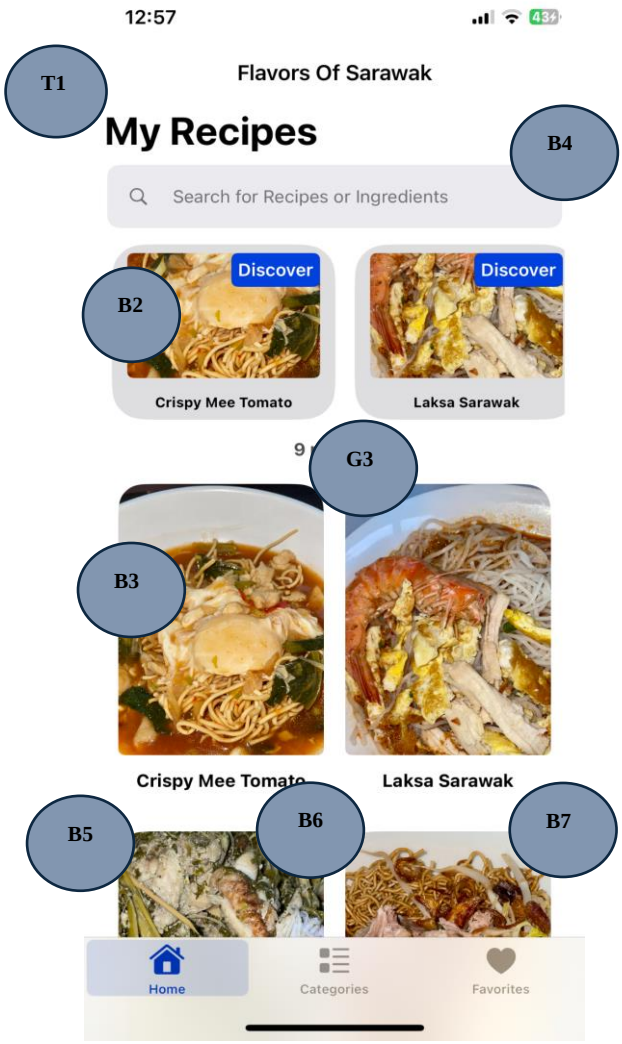
Scene 2: Main Home

Description
For this Main Home page, users can interact with the search bar. Moreover, the user can click the food recipe and it will bring the user to the "My Recipes" page.
Multimedia Elements
T (Text), G (Graphic), A (Animation), S (Sound), B (Button)
T1: Title **B2: Recipe List Button** **B3: Recipe Button** **B4: Search Recipes / Ingredients** **B5: Home Page Button** **B6: Categories Page Button** **B7: Favorites Page Button** **G3: Food Recipe Image**

Figure 9: Search Menu

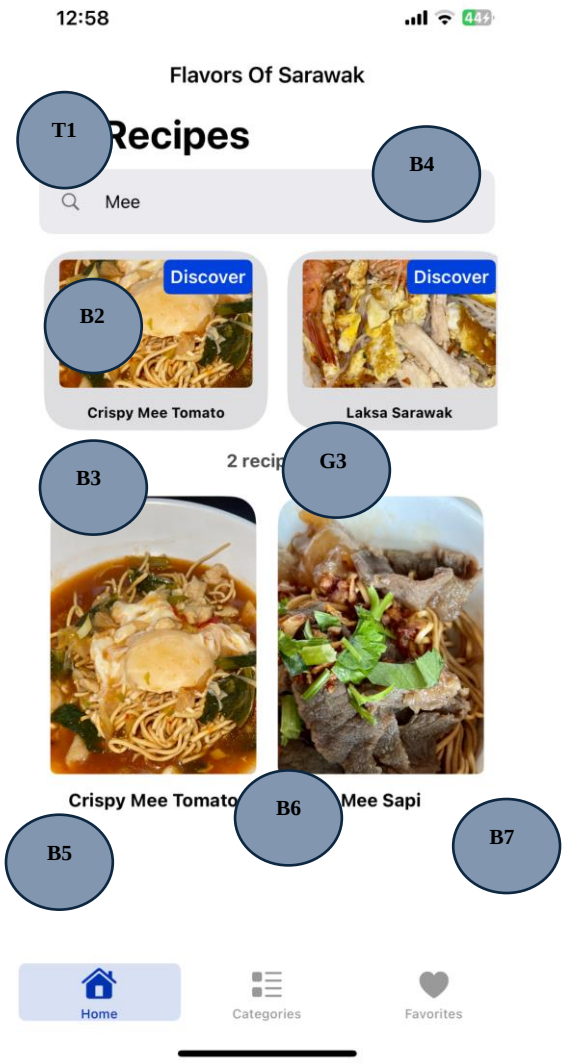
Scene 3: Search Menu

Description
When users try to search for a recipe or ingredients, a list of food recipes will appear.
Multimedia Elements
T (Text), G (Graphic), A (Animation), S (Sound), B (Button)
T1: Title **B2: Recipe List Button** **B3: Recipe Button** **B4: Search Recipes / Ingredients** **B5: Home Page Button** **B6: Categories Page Button** **B7: Favorites Page Button** **G3: Food recipe Image**

Figure 10: My Recipes

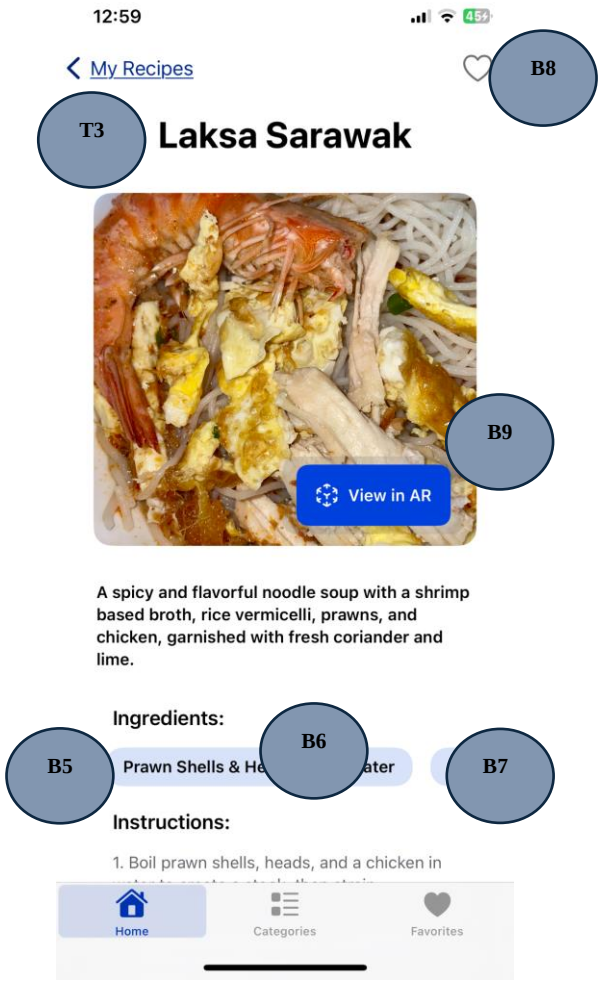
Scene 4: My Recipes

Description
For this page, it will appear once the user clicks any recipe they want. Users can click the favorite button to save the recipes on the Favorites page. Then the user can also click the "View in AR" button to go to AR mode.
Multimedia Elements
T (Text), G (Graphic), A (Animation), S (Sound), B (Button)
T3: Title **B5: Home Page Button** **B6: Categories Page Button** **B7: Favorites Page Button** **B8: Favorite Button** **B9: View AR Button**

Figure 11: AR Mode

Scene 5: AR Mode

Description
For this AR page, it will appear as soon as the user clicks the View in AR button.
Multimedia Elements
T (Text), G (Graphic), A (Animation), S (Sound), B (Button)
T4: Food Annotation Title **B10: Back Button** **G4: Recipe 3D**

Figure 12: My Categories

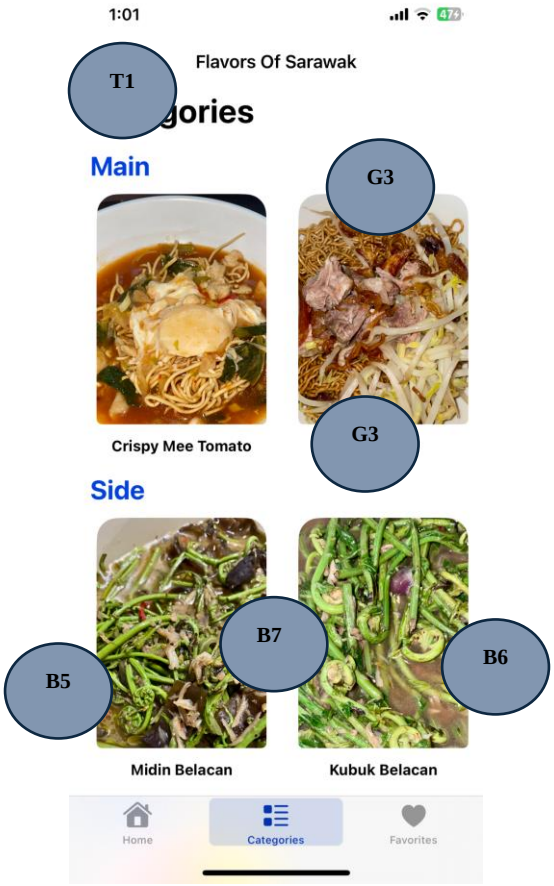
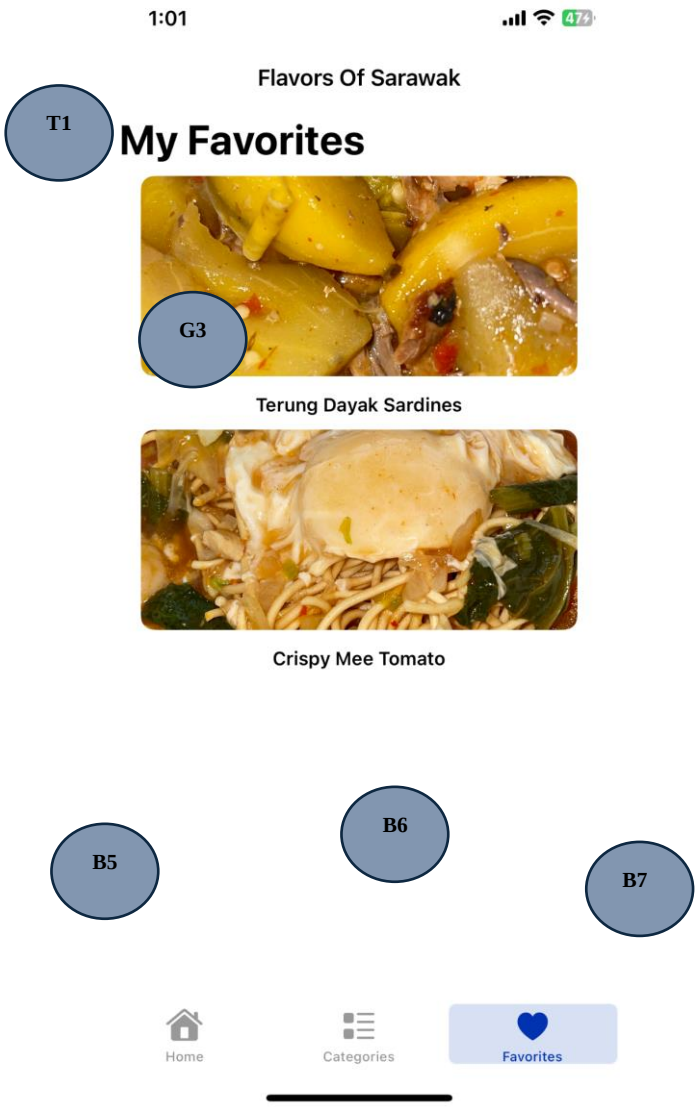
Scene 6: My Categories Page

Description
When a user clicks the Categories button, this page will appear.
Multimedia Elements
T (Text), G (Graphic), A (Animation), S (Sound), B (Button)
T1: Title B5: Home Page Button B6: Categories Page Button B7: Favorites Page Button G3: Food Recipe Image

Figure 13: My Favourites

Scene 7: My Favorite Page

Description
When a user clicks the Favorites button, this page will appear.
Multimedia Elements
T (Text), G (Graphic), A (Animation), S (Sound), B (Button)
T1: Title B5: Home Page Button B6: Categories Page Button B7: Favorites Page Button G3: Food Recipe Image

The Development Process

The development process during the project consists of several platforms. XCode, Blender, Reality Composer, and Canva were utilized in the design and development of this project. In the making of this project, some objects and stuff have been obtained from the internet and changed to create a new version. Any graphic components used in this application were created using Canva and each 3D model was created using Blender.

Usability Testing

Users will test the application to identify usability issues and gather feedback. The SUS questionnaire quantifies user satisfaction and perceptions of the application's usability, enhancing its design and functionality. This approach is to ensure the application effectively promotes Flavours of Sarawak among users.

Demographic: The evaluation's demographics reveal that the majority of the participants who test the application are female with a total of 20 (57.1%) and the rest are male with a total of 15 (42.9%). These results offer helpful information about the ages of the people studied, making it easier to understand and apply the findings of the research. Table 5.1 displays the demographic details of the participants.

Table 4: Demographic Details

		Frequency (n=36)	Percentage (%)
Gender	Male	19	52.8
	Female	17	47.2

Overall Findings: In this part, the process starts by adjusting the scores for odd-numbered questions (1, 3, 5, 7, 9) by subtracting 1. Let X represent the total score for these odd-numbered questions. Next, for even-numbered questions (2, 4, 6, 8, 10), their scores are subtracted from 5. This is calculated using the formula Y = (5 – Q2 + 5 – Q4 + 5 – Q6 + 5 – Q8 + 5 – Q10), where Y is the total score for even-numbered questions. The sum of X and Y, multiplied by 2.5, yields the final SUS score. Finally, the average SUS score is determined by finding the average of these final scores.

Table 5: Overall SUS Score

Participants	Question																Final Score
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	
P1	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	80.0
P2	4	5	5	5	5	5	4	4	5	5	5	5	4	4	5	5	77.5
P3	4	4	5	5	5	4	4	5	5	5	5	5	5	4	5	5	82.5
P4	5	5	4	4	5	5	4	5	5	4	4	5	4	5	4	5	72.5
P5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	80.0
P6	5	5	5	5	5	5	4	5	5	5	5	4	5	5	5	5	80.0
P7	5	5	5	5	5	4	5	5	5	5	5	5	5	5	5	5	82.5
P8	4	4	4	4	4	4	4	4	4	4	4	4	4	5	5	4	80.0
P9	5	5	5	5	5	5	4	5	5	5	5	5	5	5	5	5	77.5
P10	3	3	3	3	3	3	2	3	3	3	3	3	4	4	3	3	82.5

P11	3	3	3	3	4	3	2	3	3	3	3	3	5	5	2	3	90.0
P12	4	4	5	5	5	4	3	4	4	4	4	4	5	5	3	4	77.5
P13	4	4	4	4	4	3	3	3	4	4	4	4	5	5	4	4	82.5
P14	4	5	4	5	5	3	4	4	4	5	4	4	3	3	2	4	80.0
P15	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	80.0
P16	3	3	3	3	3	3	3	3	3	3	3	3	4	4	3	3	80.0
P17	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	80.0
P18	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	80.0
P19	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	80.0
P20	5	5	5	5	5	4	4	5	4	4	4	5	5	5	4	4	77.5
P21	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	80.0
P22	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	80.0
P23	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	80.0
P24	4	4	4	4	5	4	4	4	5	5	5	5	5	5	5	5	82.5
P25	5	5	3	4	4	3	4	4	4	4	4	4	4	4	3	4	77.5
P26	4	4	4	4	4	4	4	4	4	4	4	4	4	5	4	4	77.5
P27	5	5	4	5	4	3	3	3	4	4	4	4	4	4	3	5	75.0
P28	5	5	4	5	5	4	4	4	4	4	4	4	4	4	4	4	80.0
P29	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	80.0
P30	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	90.0
P31	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	80.0
P32	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	80.0
P33	4	4	3	4	4	4	4	4	4	4	4	4	4	4	4	4	85.0
P34	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	80.0
P35	5	5	5	5	5	3	3	3	4	4	4	4	4	4	4	4	85.0
										SUS Score:							**80.4**

Discussion

The Flavours Of Sarawak mobile application has achieved a commendable average SUS score of 80.4 based on the System Usability Scale assessment. This score reflects a strong level of usability and user satisfaction. On the SUS scale, ranging from 0 to 100, a score of 80.4 indicates that users perceive the app as user-friendly, efficient, and successful. This above-average score suggests that the app's interface is well-received, interactions are effective, and overall usability meets user expectations.

Typically, a SUS score above 68 signifies an above-average user experience. With a score of 80.4, the Flavours Of Sarawak app not only meets but surpasses this threshold, indicating a successful design that fulfills usability

goals. The high SUS score carries positive implications for the app's effectiveness in promoting awareness of Sarawak's diverse flavors. The user-friendly interface contributes to sustained user engagement, making the app a promising educational tool for enhancing public knowledge and appreciation of Sarawak's culinary offerings.

Furthermore, the application's notable usability score suggests its potential to effectively engage users and convey essential information about Sarawak's flavors. A well-crafted and accessible interface is likely to contribute to enhanced user learning and retention of valuable information about Sarawak's culinary heritage.

In conclusion, the SUS score of 80.4 provides strong evidence supporting the Flavours Of Sarawak app's user-friendly nature, effectiveness, and potential as an educational tool for promoting awareness. These findings are crucial for validating the app's usability and effectiveness, contributing to the body of research endorsing interactive platforms for educational purposes. It's important to consider the study's context and limitations when interpreting results and planning further enhancements to the app's design and implementation.

5. Conclusion

In summary, the Flavours Of Sarawak iOS mobile application utilizes Augmented Reality technology to enhance Food AR experiences. This integration of Augmented Reality (AR) as a marketing communication channel within the tourism and hospitality industry will hopefully help Sarawak cuisine gain global attention and momentum to transform and enhance customer experience. Based on the user acceptance result, measured through the System Usability Scale (SUS) questionnaire, it is showing positive results. The application also tackles issues like lack of standardization in Sarawak Ethnic Cuisine. It strives to empower users by enhancing their culinary proficiency while fostering an understanding of the importance of nutritious eating habits. However, there are areas for improvement in the future. This includes addressing operating system limitations, adding more food models, and enhancing interactive features. The ongoing effort to make these improvements reflects the application's commitment to providing a better and more inclusive experience for all users.

Recommendations

The application can be enhanced in the following ways:

- Create a cross-platform application that is compatible with various operating systems such as Android, Windows, Linux, and others. Removing limitations on platform usage would expand the scope of the application, allowing a broader audience, including more young users, to fully utilize its features.
- Include additional food models, particularly showcasing Flavors Of Sarawak such as creating models for "Kek Lapis Sarawak" and other commonly served dishes. This addition would likely attract more users and pique their interest in exploring various aspects of Flavors Of Sarawak's culinary traditions.
- The application needs more interactive features as the current ones are not engaging enough, possibly leading users to feel bored while using it.

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The Influence of Emotional Instability on Weight Fluctuations

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Abstract: This study examines the relationships between psychological factors, specifically mood fluctuations, short temper, and feelings of negativity, and their impact on weight gain or loss among individuals. The objective is to determine how these emotional states individually and collectively influence weight changes, focusing on understanding their predictive power. A quantitative, cross-sectional design was employed. The analysis involved correlation and multiple regression techniques to explore the relationships between the variables. Results revealed that moodiness has the strongest positive correlation with weight changes and is the most significant predictor, explaining a substantial portion of the variance. Short temper and feelings of negativity also contributed to body weight variations, though to a lesser extent. The model explained the variance in weight outcomes, highlighting the meaningful role of psychological factors in weight management. This study contributes to the growing body of research emphasizing the need to integrate mental health support in weight management programs and policy interventions, recognizing the critical role of mental well-being in influencing physical outcomes such as weight fluctuations. The findings have important implications for healthcare providers, policymakers, and wellness programs aiming to address health's psychological and physical aspects.

Keywords: *Mood fluctuations, Weight gain or loss, Emotional instability, Psychological predictors, Mental health and weight management*

1. Introduction

Numerous works have established the link between mental health and health in general and weight in particular. Depression, mood fluctuation, and negative affectivity have an impact on the process of eating and metabolic processes, which affect weight. To formulate adequate manners of intervention in the health field, it is imperative to comprehend the existence of these dynamics fully. Major depression and anxiety issues are associated with poor physical health, like obesity and cardiovascular diseases (Gandhi, 2024). Fluctuating emotions also cause unhealthy food choices (Shinde, 2024). The biopsychosocial model states that the healthcare system should consider psychological and social factors to enhance the prognosis for chronic illnesses such as obesity and other related diseases, as proposed by Alsudairy et al. (2023).

Mental health illnesses are worsened by obesity, which in turn leads to captured symptomatology like fatigue and joint pain, which further declines the quality of life, hence increasing stress, anxiety, and depression (Jaison et al., 2024). Crude self-rated mental health statistics reveal that those with obesity have a higher prevalence of depression and anxiety, and these numbers may be even higher because of survey attrition. More longitudinal studies were identified by Vowels et al., 2024. Young people show a U-shape relationship between BMI scores and mental well-being by indicating raised psychosomatic complaints at low and high BMI, indicating the significance of exponential interventions (Chen et al., 2024). Lack of physical activity, which is caused by poor mental health, plays a middle role between mental and physical health, causing severe bodily pain and chronic diseases (Kocjan et al., 2023). Obesity as a disease has social prejudice and disrespect through societal stigmatization that raises both psychological stresses and prevents weight loss (Steptoe & Frank, 2023). These pathways include neuroendocrine and inflammatory mechanisms; obesity treatment, with its results, can enhance the quality of mental and psychological states (Melamed et al., 2024). Credible research provides qualitative and quantitative evidence on the causal relationship between mental and physical health to call for policy intercession to deal with mental health to enhance physical health (Shangkhum & Zikos, 2023). In other words, it is necessary to introduce multifactorial prevention aimed at the consideration of psychological and physical conditions as the significant prerequisites of obesity and weight issues in general.

Furthermore, the connection between physical activity and mental health is about how often one exercise and whether individuals are physically active. Research suggests that physically active individuals generally

experience better mental health outcomes than inactive ones (Popov et al., 2023). The positive effects of physical activity on mental health are well-documented, with evidence supporting its role in reducing anxiety, stress, and depression while also improving mood, self-esteem, and cognitive function (Singh, 2024). This relationship is also evident in adolescents, where physical exercise contributes to emotional, cognitive, and social adaptation, highlighting the physiological and psychoanalytic mechanisms through which exercise benefits mental health (Gu, 2023).

A previous study by Yang & Zikos (2024) stated that body fitness affects mental health through physical exercise. Positive psychological states result in increased chances of the individual participating in physical activities, which positively impacts that individual's physical health. It produced evidence that apart from contributing to health complications, inactivity triggers the worsening of physical health problems, including bodily pain and chronic diseases, by people with depression who are less active. Other research also shows that other mental health issues like depression, anxiety or stress are also linked to poor physical health like heart disease, obesity, and diabetes (Gandhi, 2024). Physical activity also helps prevent mental disorders and enhances mental health; hence, physical activity promotion can be a practical approach to preventing and even treating mental health disorders(Lacerda et al., 2024). These results suggest that organized physical education programs benefit physical and mental health and that such intervention improves total health and mental health indicators (Nashwan, 2024).

The biopsychosocial model reveals how mental and physical health are intertwined and illustrates how mental disorders affect health behavioral patterns, medication compliance, and how diseases affect cognition (Kagee & Freeman, 2023). That is interesting to know that even though mental health challenges are known to be directly correlated with negative impacts on people's physical health, it is crucial to remember that there are still many people with mental health issues but without adverse physical health, which makes this connection more complex and in need of further research to find out the best ways to improve interventions and policies that can help people with poor mental health to become healthier both mentally. Obesity requires attention to the psychological approaches to address since psychological distress is now associated with obesity. Depression and obesity have been observed to have a positive relationship, whereby people with higher BMI reported more symptoms of stress, anxiety, and depression as found by (Gandhi, 2024).

This comprehensive understanding of the interplay between mental and physical health, mediated by physical activity, is crucial for developing strategies to enhance public health and reduce the societal impact of mental and physical health disorders. The relationship between emotional states and weight management is intricate. Negative emotions such as moodiness and negativity significantly influence behaviors like emotional eating and self-regulation, which in turn can affect weight changes. Research by Annesi and Powell (2023) suggests that baseline negative mood can moderate the relationship between emotional eating and weight change. It implies that individuals with a higher baseline negative mood may experience more pronounced weight fluctuations due to emotional eating. Improvements in self-regulation have been linked to reductions in negative mood and emotional eating, indicating that enhancing self-regulation skills can mitigate the adverse effects of negative emotions on weight management (Annesi, 2021a; Annesi & Powell, 2023).

Furthermore, emotion dysregulation has been identified as a mediator between pathological eating styles and psychopathological traits, emphasizing the importance of emotion regulation in managing obesity, particularly in bariatric surgery candidates (Belloli et al., 2024). Additionally, adaptive emotion regulation skills can help manage food intake following hunger-induced negative emotions, suggesting that individuals who can regulate their emotions may better control their eating behaviors and maintain a healthy weight (Ackermans et al., 2023). These findings highlight the need for a comprehensive approach to obesity treatment that considers psychological, biological, and environmental factors. Addressing emotional states and enhancing emotion regulation skills could improve weight management and mental health outcomes. Individuals who lose weight often report improvements in mental health, while those who gain weight may experience declines (Hill et al., 2024; Belloli et al., 2024; Annesi & Powell, 2023; Ackermans et al., 2023).

The association between these two is, thus, complex and not straightforward. Mental attitudes like mood swings and negativity have a significant say in the behavioral patterns of people, like emotional eating and self-control, which, in one way or another, can lead to weight fluctuations. According to the study by Annesi and Powell

(2023), the negative mood at baseline can interact with the effect of emotional eating on weight change. More precisely, it means that people with higher indexes of negative mood at the baseline level will have more significant shifts in weight caused by appetite regulation by emotions (Annesi & Powell, 2023). Increased positive self-regulatory behaviors have been associated with reduced negative mood/ emotional eating. Hence, when clients learn to increase functions that help manage self-regulation, the negative effects of mood on weight will be minimized by Annesi and Powell (2023). In addition, emotion dysregulation has been indicated as a mediator between pathway eating styles and psychopathological features, suggesting the need to regulate emotions to overcome obesity, especially among bariatric surgery candidates (Belloli et al., 2024).

It is common knowledge that different emotions lead to different changes in our weight. Emotional stress, as well as anxiety and depression, significantly affect body weight in a negative manner or way. Cognitive eating, especially eating as a result of emotions, is a very common cause of weight gain and obesity. It often leads to eating unhealthy like fast foods (Dakanalis et al., 2023). It has also been established that depressive symptoms and negative life events can lead to weight gain, and this is particularly so for people who have had the habit of emotional eating. Those psychological factors may escalate weight concerns in the long run (Van den Hout et al. (2023). In addition, emotional eating has also been found to mediate the effects of physical activity on weight change. It implies that mood and emotional state could significantly improve.

Of all the strategies used in community-based interventions, self-regulation, and increased physical activity override emotion-led eating and enhance mood, resulting in better weight control outcomes (Annesi, 2021b). Stress and anxiety have been reported to be associated with weight maintenance difficulties, especially in persons with weight cycling behavior; eating behavior has been identified to moderate the relationship (Li et al., 2024). The psychological effects of obesity necessitate approaches that consider all aspects of human persons, including the psychosocial ones. Through previous research, it is evident that obesity is highly correlated with decreased health-related quality, stress, anxiety, and depression (Jaison et al., 2024). Weight control programs may also be enriched by intervention components related to self-regulation, self-efficacy, and mood improvements (Annesi, 2020). Thus, psychological support should be included in weight loss programs to focus on the psychological aspects of weight gain and loss to achieve better results and quality of life.

The interaction between emotional states and obesity in the context of weight loss interventions has become a paramount public health concern. Changes in mood, including anxiety, depression, or emotional fluctuations, have been shown to disrupt eating patterns, energy balance, and metabolism significantly. Emotional distress is increasingly recognized as a risk factor for obesity; however, the precise mechanisms through which emotional instability influences weight gain or loss are not well understood. This gap in knowledge limits the development of targeted interventions. This issue is further complicated by the bidirectional nature of the relationship, where weight fluctuations negatively affect psychological well-being, perpetuating unhealthy dietary behaviors and limiting long-term weight management success. For example, emotional instability often triggers behaviors such as binge eating, loss of self-control, and avoidance of exercise, all of which are critical factors in weight gain or failure to lose weight. Without adequately addressing emotional triggers, individuals are more likely to relapse into maladaptive eating patterns, hindering the success of weight control programs.

This study is significant because it offers more profound insights into how emotional instability influences weight outcomes, providing a comprehensive understanding of the psychological factors that underpin unhealthy weight changes. By identifying the direction and magnitude of this relationship and exploring key moderators (e.g., emotional regulation and self-control), the study contributes to more refined and effective weight management strategies. The findings will help inform tailored interventions that address psychological and physiological factors, improving outcomes for individuals struggling with weight management.

Ultimately, understanding the influence of emotional instability on weight will allow healthcare providers and policymakers to design more sustainable, personalized approaches for weight control. Such strategies would promote healthier eating patterns, consistent exercise, and reduce emotional distress, ensuring long-term weight stability and overall well-being.

Research Objectives (RO)

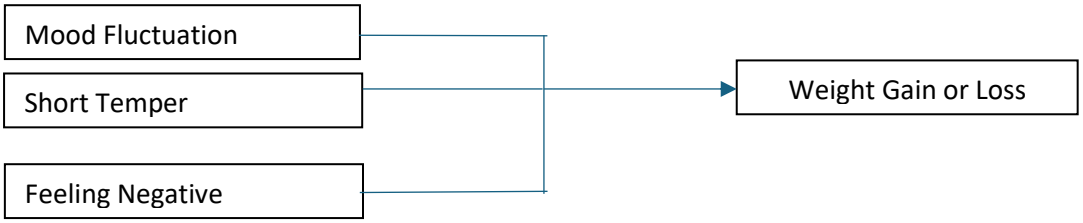
The following were the objectives of the study:

RO1: To determine if a significant relationship exists between mood fluctuations and weight gain or loss among individuals.
RO2: To examine whether short temper significantly affects weight gain or loss among individuals.
RO3: To explore the relationship between feelings of negativity and weight gain or loss among individuals.

This study hopes to address the following research questions:
Research Questions (RQ)
The following were the research questions of the study:
RQ1: Is there a significant relationship between mood fluctuations and weight gain or loss among the respondents?
RQ2: Does a short temper significantly impact the weight gain or loss of the respondents?
RQ3: Is there a significant relationship between feelings of negativity and weight gain or loss?

Conceptual framework and hypotheses development

Figure 1: The Conceptual Framework



2. Literature Review

Hypotheses development
Based on the above discussion, the following hypotheses were developed:

The relationship between moodiness and weight gain or loss is complex and multifaceted, as evidenced by various studies. Research indicates that mood disorders and obesity are often co-morbid, with both conditions sharing clinical, neurobiological, genetic, and environmental factors, suggesting a possible "metabolic-mood syndrome" (Mansur et al., 2015). Mood changes, particularly negative mood, have been shown to predict weight gain, while weight loss can lead to mood improvements, highlighting a bidirectional relationship (Koster et al., 2010). In behavioral obesity treatments, mood improvements are associated with better weight loss outcomes, with self-regulation and emotional eating mediating this relationship (Annesi, 2021a; Annesi & Eberly, 2022). Physical activity enhances mood, reduces emotional eating, and facilitates weight loss (Annesi, 2021c). Studies have shown that mood improvements are more significant in treatments emphasizing self-regulation than focusing solely on weight-loss education (Annesi, 2021c; Annesi & Eberly, 2022).

Furthermore, mood disorders such as depression and bipolar disorder are linked to higher rates of obesity, with atypical depression in females being more associated with being overweight (McElroy et al., 2004). The reciprocal relationship between mood and weight change is also evident in older adults, where depressed mood can lead to weight gain, and weight loss can result in increased depressive symptoms, partly mediated by deteriorations in health (Koster et al., 2010). The literature also suggests that sustaining physical activity beyond the initial treatment phases can maintain mood-related benefits, which are crucial for long-term weight management (Annesi, 2020). Despite the positive mood changes observed in many behavioral weight loss programs, the relationship between mood and weight is not straightforward. Not all studies report significant mood improvements, and the mechanisms underlying these changes remain fully understood (Wing et al., 1984). The use of prospective designs and a moderator-mediator framework in recent studies have advanced the understanding of these relationships, emphasizing the need for integrative and multidisciplinary approaches to address the obesity and mood disorder epidemic (Faith et al., 2004). Overall, the evidence underscores the importance of considering psychological and behavioral factors in obesity treatments, as mood changes can significantly impact weight management outcomes (Sousa, 2022).
H1: There is a significant relationship between moodiness and weight gain or loss among the respondents.

The relationship between short temper, often associated with anger and hostility, and weight gain or loss is complex and multifaceted, involving psychological, behavioral, and physiological factors. Research indicates that psychological attributes such as anger and hostility can influence weight change, particularly in the context of central obesity. For instance, a study on postmenopausal women found that higher levels of trait anger and anger expression were associated with increased visceral adipose tissue, a form of central obesity, over 13 years (Räikkönen et al., 1999). It suggests that individuals with a short temper may be at risk for weight gain, particularly in the form of central obesity, which is a known risk factor for chronic diseases. Additionally, depressive symptoms, which can be related to emotional dysregulation, such as short temper, have been shown to predict both weight gain and weight loss. A study found that higher depression scores were linked to weight gain in some groups and weight loss in others, highlighting the nuanced role of emotional states in weight change (Haukkala et al., 2001).

Furthermore, the accumulation of multimorbidity, which can be exacerbated by weight gain, has been associated with short-term weight changes in mid-aged women, indicating that emotional and psychological stressors, potentially including short temper, could contribute to weight gain and related health issues. In the context of bariatric surgery, disordered eating behaviors such as binge eating, which can be exacerbated by emotional distress and short temper, were negatively correlated with excess weight loss, suggesting that emotional regulation issues can hinder weight loss efforts post-surgery (Simpson, 2016). Moreover, interventions aimed at managing anger and aggression, such as cognitive-behavioral programs, have shown promise in reducing emotional dysregulation and potentially mitigating its impact on weight. Additionally, mental toughness, which can be inversely related to a short temper, has been studied in athletes, showing that increased mental resilience is associated with lower levels of aggression and anger, suggesting that enhancing emotional regulation could benefit weight management (Koç, 2022). While the direct relationship between short temper and weight change is not fully elucidated, the interplay of emotional regulation, psychological stressors, and behavioral responses such as eating habits significantly influence weight gain or loss. Addressing these emotional and psychological factors through targeted interventions could be crucial in managing weight effectively.

H2: There is a significant relationship between short temper and weight gain or loss.

The relationship between feelings of negativity and weight gain or loss is multifaceted, involving psychological, emotional, and behavioral dimensions. Negative affect has been shown to mediate the relationship between body dissatisfaction and disordered eating behaviors, such as bulimia and dietary restraint, particularly in women, indicating that negative emotions can drive unhealthy weight loss strategies (Heywood & McCabe, 2006). Furthermore, negative emotions have been found to predict the intake of unhealthy food and the seeking of social support, which can influence weight gain. In contrast, positive emotions are associated with increased physical activity, suggesting that emotional valence is crucial in weight management beyond traditional constructs like attitude and perceived control (Richards et al., 2021). Psychological threats, such as societal pressures and body dissatisfaction, can lead to long-term weight gain, as seen in studies where values affirmation helped women maintain weight by buffering against these threats (Logel et al., 2019). Daily weight gain can also trigger negative moods, guilt, and shame, leading to decreased motivation and less effective weight control behaviors, highlighting the demoralizing effect of even minor weight fluctuations on individuals in behavioral weight loss programs (Hagerman et al., 2024). Negative affectivity is linked to lower satisfaction with exercise programs and a quicker drop-off in continued involvement.

In contrast, positive affectivity correlates with higher satisfaction and sustained engagement, indicating that affective orientation significantly impacts the likelihood of maintaining health-related behaviors (Hamid, 1990). In the context of bariatric surgery, psychological factors such as anxiety and disordered eating behaviors like binge eating and night eating can predict poorer weight loss outcomes, suggesting that negative psychological states can hinder long-term success post-surgery (Simpson, 2016). The concept of negativity bias, where negative events have a more significant subjective impact than positive ones, further explains why negative emotions might substantially affect weight-related behaviors, as individuals may be more sensitive to negative stimuli, leading to maladaptive responses (Lazarus, 2021). Additionally, the neural response to losses, as measured by feedback negativity, is typically more pronounced than the response to gains, indicating a potential neural basis for the stronger influence of negative emotions on behavior (Weinberg et al., 2014).

Overall, these findings underscore the importance of addressing negative emotions and psychological threats in weight management interventions, as they can significantly influence both weight gain and loss behaviors.
H3: There is a significant relationship between feelings of negativity and weight gain or loss**.**

3. Methodology

This study adopts a quantitative, cross-sectional research design to explore the relationships between mood fluctuations, short temper, feelings of negativity, and weight gain or loss among individuals. A cross-sectional design allows data collection from a sample of respondents simultaneously, which is appropriate for analyzing relationships between psychological variables and weight changes. The target population for this study includes individuals aged 18 and above who may experience mood fluctuations, short temper, and negative feelings. These emotional states may affect their eating behaviors, physical activity, and weight changes, making them suitable participants for the study's focus. A sample of 115 respondents was selected for this study using convenience sampling. Convenience sampling was chosen due to its ease of access and time efficiency, allowing for a wide range of participants to be surveyed within a limited time frame. While this method may limit generalizability, it is sufficient for exploring the relationships between variables in an exploratory study.

Data was collected through a structured questionnaire, administered online and in paper format, ensuring accessibility for respondents with varied preferences. The questionnaire was divided into two sections, demographic information. This section gathered basic details, including age, gender, and self-reported weight changes (e.g., recent weight gain or loss). Psychological measures are the second section that measures emotional instability, including mood fluctuations, short temper, and negative feelings, using items adapted from validated psychological scales. The sources used were Mood fluctuations adapted from the Positive and Negative Affect Schedule Watson et al., (1988). The Short temper and anger items from the State-Trait Anger Expression Inventory (STAXI-2) by Spielberger (1999) and Negative feelings were adapted from the Depression, Anxiety, and Stress Scale by Lovibond & Lovibond (1995). All variables were measured using a Likert-type scale ranging from 1 to 5, with higher scores reflecting greater intensity or frequency of the psychological states (e.g., more severe mood swings or stronger feelings of negativity). Data analysis was conducted using SPSS (Statistical Package for the Social Sciences) version 26. The analysis included Descriptive Statistics, Correlation Analysis, and Multiple Regression Analysis

Validity and Reliability

The validity of the instrument was ensured through a review of the questionnaire by experts in psychology and health research to ensure that the items effectively measured the constructs of moodiness, short temper, and feelings of negativity. A pilot test was conducted with 20 respondents to refine the questionnaire, ensuring that all items were understandable and appropriately measured the intended variables. Reliability was assessed using Cronbach's alpha, with an alpha value of 0.7 or above, which is considered acceptable for internal consistency.

4. Findings and Discussion

Table 1: Correlations

		Gainlossweight	moody	shorttemper	Feelingneg
Gain loss weight	Pearson Correlation	1	.596**	.396**	.315**
	Sig. (2-tailed)		.000	.000	.001
	N	115	115	115	115
moody	Pearson Correlation	.596**	1	.341**	.182
	Sig. (2-tailed)	.000		.000	.052
	N	115	115	115	115
short temper	Pearson Correlation	.396**	.341**	1	.413**
	Sig. (2-tailed)	.000	.000		.000
	N	115	115	115	115
feeling new	Pearson Correlation	.315**	.182	.413**	1
	Sig. (2-tailed)	.001	.052	.000	
	N	115	115	115	115

**. Correlation is significant at the 0.01 level (2-tailed).

Table 1 presents the correlation analysis revealing several significant relationships between the variables. A moderate to strong positive correlation was found between weight gain or loss and moodiness ($r = 0.596$, $p = 0.000$), indicating that as respondents become moodier, their weight fluctuates more significantly. This relationship is statistically significant ($p < 0.01$). Similarly, there is a moderate positive correlation between weight gain or loss and short temper ($r = 0.396$, $p = 0.000$), suggesting that individuals who exhibit higher levels of short temper are more likely to experience changes in their weight. The association between weight gain or loss and feelings of negativity ($r = 0.315$, $p = 0.001$) is also statistically significant, though the correlation is weaker than moodiness and short temper. These results indicate that individuals with more negative feelings are likely to experience more weight gain or loss.

In terms of the relationships between the psychological variables, moodiness, and short temper are moderately correlated ($r = 0.341$, $p = 0.000$), implying that moodier individuals tend to be more short-tempered. The relationship between moodiness and feelings of negativity ($r = 0.182$, $p = 0.052$) is weaker and not statistically significant, as the p-value is slightly above the 0.05 threshold. Finally, a moderate positive correlation was found between short temper and feelings of negativity ($r = 0.413$, $p = 0.000$), indicating that as individuals become more short-tempered, their negative feelings also increase. This relationship is statistically significant, further supporting the idea that emotional instability tends to co-occur with weight changes and other negative emotional states.

Discussion on correlations

The correlation analysis examined the relationships between weight gain or loss, moodiness, short temper, and feelings of negativity. The results indicate significant positive relationships between weight gain or loss and the psychological variables.

Weight gain or loss and moodiness ($r = 0.596$, $p < 0.01$): A moderate to strong positive correlation exists between moodiness and weight gain or loss. It suggests that individuals who experience higher levels of mood fluctuations are more likely to report changes in their weight. The significance of this correlation ($p < 0.01$) indicates that moodiness is an important factor associated with weight gain or loss in the population studied. Weight gain or loss and short temper ($r = 0.396$, $p < 0.01$): A moderate positive correlation was found between short temper and weight gain or loss. As individuals become more short-tempered, they tend to experience changes in their weight. This relationship is statistically significant, suggesting that emotional regulation may play a role in physical changes such as weight gain or loss. Weight gain or loss and feelings of negativity ($r = 0.315$, $p < 0.01$): A weaker yet statistically significant positive correlation exists between feelings of negativity and weight gain or loss. Although this relationship is less pronounced than moodiness and short temper, it still indicates that negative feelings contribute to variations in weight.

These findings suggest that psychological factors, particularly moodiness, are strongly associated with weight changes. Individuals who exhibit higher levels of mood instability or irritability may be more prone to weight gain or loss, highlighting the potential impact of emotional states on physical well-being.

Multiple Regression Analysis

The following sections will provide detailed results on the statistical significance of each predictor and their respective impacts on positive thinking. The discussion will interpret these findings in light of existing research and provide insights into their practical and theoretical implications. The limitations and potential areas for future research will also be considered.

Table 2: Analysis of Variance ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	32.749	3	10.916	26.554	.000[b]
	Residual	45.633	111	.411		
	Total	78.383	114			

a. Dependent Variable: Gainlossweight

b. Predictors: (Constant), feelingneg, moody, short temper

Table 2 presents the F-statistic of 26.554, indicating the overall significance of the regression model, with a large value suggesting that the model is a good fit for the data. Additionally, the p-value (Sig. = 0.000) is highly significant ($p < 0.01$), meaning that the predictors—moodiness, short temper, and feelings of negativity collectively have a significant impact on the dependent variable, weight gain or loss. This statistical significance confirms that the model is reliable in explaining the variations in weight gain or loss based on these psychological factors.

Table 3: Coefficients of the Regression Model

Model		Unstandardised Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.605	.135		4.496	.000
	moody	.441	.066	.515	6.672	.000
	shorttemper	.117	.063	.155	1.863	.065
	feelingneg	.110	.055	.158	1.978	.050

a. Dependent Variable: GAinlossweight

Table 3 shows the coefficients table illustrates the individual contributions of each predictor to the model. The constant (B = 0.605) represents the predicted value of weight gain or loss when all other predictors (moodiness, short temper, and feelings of negativity) are zero, and it is statistically significant with a p-value of 0.000. For moodiness, the unstandardized coefficient (B = 0.441) indicates that for every 1 unit increase in moodiness, there is a predicted increase of 0.441 units in weight gain or loss, holding all other variables constant. The standardized coefficient (Beta = 0.515) suggests that moodiness has a significant relative impact on weight gain or loss among the predictors, with a highly significant t-value of 6.672 and a p-value of 0.000.

For short temper, the unstandardized coefficient (B = 0.117) shows that for every 1 unit increase in short temper, there is a predicted increase of 0.117 units in weight gain or loss, holding other variables constant. However, its standardized coefficient (Beta = 0.155) indicates that a short temper has a more minor relative impact than moodiness. The t-value of 1.863 and a marginally non-significant p-value of 0.065 suggest that while short temper is not a strong predictor, it may still influence weight gain or loss with borderline significance.

Lastly, feelings of negativity show an unstandardized coefficient (B = 0.110), meaning that a 1 unit increase in negativity predicts a 0.110 unit increase in weight gain or loss. The standardized coefficient (Beta = 0.158) implies a slightly significant relative effect than short temper but is still less influential than moodiness. The t-value of 1.978 and p-value of 0.050 indicate that feelings of negativity have a weak yet statistically significant impact on weight gain or loss.

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.646[a]	.418	.402	.64118

a. Predictors: (Constant), feelingneg, moody, short temper

Table 4 shows the Model Summary, which indicates several important statistics about the regression model. The R-value is 0.646, representing the correlation coefficient, which measures the strength of the relationship between the observed and predicted values of the dependent variable (weight gain or loss). An R-value of 0.646 suggests a moderate positive correlation between the predictors (moodiness, short temper, and feelings of negativity) and the outcome (weight gain or loss). The R^2 value of 0.418 means that 41.8% of the variance in weight gain or loss is explained by these predictors, which suggests that the model explains a significant portion of the variability in the dependent variable. The Adjusted R^2 value of 0.402 considers the number of predictors in the model. It is very close to the R^2 value, indicating that the model is well-fitted and does not suffer from an excessive number of predictors given the sample size. Finally, the Standard Error of the Estimate is 0.64118, representing the average distance that the observed values deviate from the regression line, indicating the model's precision in predicting weight gain or loss.

Discussion on Multiple Regression Analysis

The multiple regression analysis further explored the predictive power of moodiness, short temper, and feelings of negativity on weight gain or loss. The model was statistically significant ($F = 26.554$, $p < 0.01$) and explained 41.8% of the weight gain or loss variance, indicating that these psychological factors are meaningful predictors of weight changes.

Moodiness emerged as the strongest predictor of weight gain or loss, with a standardized coefficient (Beta) of 0.515. It suggests that mood fluctuations have a substantial impact on weight. The unstandardized coefficient ($B = 0.441$, $p < 0.01$) indicates that weight gain or loss increases by 0.441 units for every unit increase in moodiness. The finding aligns with the correlation analysis and reinforces mood's significant role in affecting physical outcomes.

Short temper ($B = 0.117$, $p = 0.065$) showed a weaker relationship with weight gain or loss than moodiness. While the direction of the relationship was positive, its significance level ($p = 0.065$) indicates that short temper is only marginally predictive of weight changes. The standardized coefficient (Beta = 0.155) also shows that its relative contribution to the model is much smaller than moodiness. These results suggest that a short temper may influence weight, but its effect is weaker and less consistent.

Feelings of negativity ($B = 0.110$, $p = 0.050$) also demonstrated a relatively weak but statistically significant influence on weight gain or loss. With a standardized coefficient (Beta = 0.158), it contributed more than short temper but far less than moodiness. This finding suggests that while feelings of negativity play a role in predicting weight changes, they are not as impactful as moodiness in this context.

The regression analysis confirmed that moodiness is the most critical psychological factor associated with weight gain or loss. Short temper and feelings of negativity contribute to the model but are less influential. The fact that the model explains a substantial portion of the variance (41.8%) indicates that emotional and psychological states are essential determinants of weight gain or loss. These findings highlight the need for addressing mood and emotional regulation in efforts to manage or understand weight-related issues, suggesting that interventions focused on mood stabilization could potentially help in weight management strategies.

5. Contribution of the Study

This research contributes to the study of how psychological factors such as mood swings, short fuse, and negativity lead to weight gain or loss. Thus, the results indicate that mood swings affect weight loss most of all, and evidence proves that instability plays an important role in weight loss. It also highlights the other but equally essential contribution of short temper and feelings of negativity contributing to chronic diseases, making the literature rich in the emotional and psychological aspects of health status. Thus, it highlights and supports the factors of combining the emotional and psychological approaches to weight management strategies, potentially enhancing the reduction or increase of obesity interventions.

Policy Implications

The results of this study suggest several important policy implications, particularly in healthcare and mental health support. Policymakers should consider incorporating psychological assessments into weight management programs, as emotional states like moodiness significantly impact weight fluctuations. It could include regular mental health screenings or counselling services as part of comprehensive obesity and weight loss programs. Public health campaigns could also raise awareness about the links between emotional health and weight changes, promoting mental well-being as a preventive measure for physical health issues such as obesity. Employers and organizations could also consider incorporating mental health support systems in wellness programs to help employees manage stress and emotional instability, which could positively influence their physical health.

Limitations of the Study

Despite its contributions, this study has several limitations. First, convenience sampling limits the generalizability of the results to a broader population, as the sample may not be fully representative. Second,

the cross-sectional design of the study does not allow for causal inferences, meaning that while significant relationships between variables were found, the study cannot determine whether changes in moodiness, short temper, or negativity directly cause weight gain or loss. Additionally, the reliance on self-reported data introduces the possibility of response bias, where participants may not accurately report their emotional states or weight changes. Finally, while the study explains a significant portion of the variance in weight gain/loss (41.8%), other potential psychological or environmental factors influencing weight changes were not examined.

Conclusion

Based on this study, psychological factors, especially mood swings, are important in determining a person's weight change or loss. The individuals' moods were the most significant predictors, showing that mood swings play a role in weight variations. Intolerance also pulled down weights and negativity, although in a lesser way than height/length fluctuations. It may also be concluded that obesity control OAD interventions should consider psychological variables because of the close relationship between emotional and physical health. The current study reaffirms the role of the affect regulatory system in obesity and demonstrates that weight control could require mental health assistance.

Recommendations

Based on the findings of this study, several recommendations can be made. For example, healthcare providers and weight management services should offer psychological support, including mood regulation therapies and counselling, to help individuals manage emotional fluctuations that may contribute to weight gain or loss. Future research should use a longitudinal design to explore the causal relationships between psychological factors and weight changes over time, providing more precise insights into how emotional states impact weight in the long run. Public health campaigns should educate individuals about the impact of emotional well-being on physical health. It could encourage individuals to seek help for mood instability and emotional distress as part of their overall health maintenance. Future studies can include additional psychological, social, and environmental factors that might influence weight gain or loss. Understanding the factors affecting weight changes could lead to more comprehensive interventions. Finally, organizations should integrate mental health services within employee wellness programs to address stress, emotional instability, and negative effects, which can indirectly contribute to better physical health outcomes, including weight management.

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Innovating Community Engagement: The Role of Micro-Influencers in Promoting Sustainable Behaviors among Malaysian Millennials

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Abstract: Social Influencers as environmental leaders utilize social media platforms to enhance community engagement in advocating sustainability. This study explores the underexplored role of micro-influencers in fostering pro-environmental behaviors among Malaysian youths and innovating community engagement by employing a qualitative approach in conducting semi-structured interviews with five micro-influencers. Our findings indicate the critical role of micro-influencers in raising awareness and actively engaging communities in adopting sustainable practices. The findings reveal three key themes: leadership qualities, pro-environmental behaviors, and persuasive narrative strategies. Through the innovative use of social media, these influencers overcome linguistic and geographical barriers, fostering enhanced community engagement in the pursuit of environmental stewardship. However, the sample size of five micro-influencers may limit the generalizability of the findings, as it may only partially represent the diverse range of micro-influencers. The result of this research can be used as recommendations for organizations, non-governmental organizations and governmental bodies that can leverage the insights from this study to strategically engage micro-influencers in environmental campaigns, recognizing their unique ability to reach and resonate with specific communities, particularly Malaysian youths. This study offers a novel perspective on digital environmental leadership by uncovering the unique role of micro-influencers in fostering community engagement and cultivating a culture of sustainability. It provides original insights into how these emerging leaders not only inspire but also empower communities to take meaningful action toward environmental preservation. The study highlights the underexamined potential of micro-influencers in exceeding traditional barriers to community engagement, offering valuable implications for future strategies in environmental advocacy.

Keywords: *Micro-influencers, Community Engagement, Environmental leaders, Social media, Millennials, Sustainable behaviors*

1. Introduction

Technology has revolutionized modern societies as cyberspace and physical spaces are integrated seamlessly. Technology and constant innovation benefit sustainable development which reduces man-made environmental disasters. Digitalized modern societies are expected to assume the roles of responsible members by exhibiting pro-environmental behaviors as they conserve and protect the environment for future generations while meeting their present needs (Akers, 2018). Although developing countries are lagging behind their developed counterparts, there is a steady growth of environmental awareness which supports the thriving green-conscious products and services (Audrezet et al., 2017). Present governments also support to conserve and managing the environment by concentrating on sustainable economic, social and environmental developments. Environmental communication involves interdisciplinary fields with climate communication, corporate social responsibility, and public engagement as key topics (Akerlof et. al, 2022).

Environmental knowledge and concerns differ among the generations (Topic & Mitchell, 2019). Technological savvy societies require effective environmental leaders with similar values and practices who are capable of persuading community members to exhibit desired environmental behaviors. In current communities, most of these informal leaders communicate with their subordinates in digital contexts, unlike previous offline leaders. In addition, the attachment of younger generations to social media contributes to the demands of digital environmental leaders among social influencers (Jalali & Khalid, 2021). Social influencers are opinion leaders as they wield their influence on their followers through strong persuasive content and role-model traits (Awang et al., 2021; Basit et al., 2017). These social influencers establish their credibility and authenticity through their social media accounts. Environmental awareness and pro-environmental behaviors can be

modelled for the millennial audience through social media influencers (Berestova et al., 2020). Social influencers engage their followers with exciting content on environmental awareness like biodiversity, climate change and sustainability and influence the audience to persuade them to form pro-environmental behaviors.

Millennials were born between 1981 and 2000 and are known as millennials (Fry, 2016). According to Weber (2017), millennials have a wealth of information-based experiences. When millennials are connected to nature, however, they are inspired to undertake pro-environmental behaviors to preserve the environment (Gräntzdörffer et al., 2019). For instance, American millennials are green consumers because they are influenced by future-oriented mindsets despite not being financially stable (Naderi & Steenburg, 2018). They invest in the well-being of the environment and the people since they will live longer than older people. Another interesting finding of the study is that millennials' pro-environmental behaviors are influenced by self-benefits.

Despite the growing influence of social influencers, there are limited studies on how their environmental leadership impacts their millennial followers (Rosaidi et al, 2022; Radzi et al, 2022). To address this gap, the present study investigates the role of social media influencers in fostering pro-environmental behaviors among Malaysian youths highlighting innovative community engagement. By examining how these influencers construct their roles as digital environmental leaders, this study aims to shed light on the evolving role of social influencers as environmental leaders and community engagement innovators.

2. Literature Review

Educating society members to be environmentally responsible can be achieved through lifelong environmental education (Clugston, 2004). Pro-environmental behaviors, which include actions that protect the environment, are crucial in this endeavor (Razak & Sabri, 2019). Environmental knowledge plays a significant role in fostering these behaviors in both public and private spheres by informing people about environmental challenges. As awareness of human-caused environmental issues—such as water pollution, climate change, ozone depletion, waste, and industrial discharge—grows, so does pro-environmental consciousness.

Organizations are increasingly using social media platforms to promote environmental awareness, particularly among younger generations. For example, modern zoos leverage their social media platforms to enhance awareness of conservation and ecology (Rose et al., 2018). Over the last decade, social media platforms have evolved from communication tools to an integral part of the information landscape, influencing politics, business practices, education and community engagement (Hemsley et al., 2018; Gleason & Von Gillern, 2018). Social networks are embedded in daily lives and continue to play a significant role due to their ability to facilitate instant communication and access to information (Tsyetkova et al., 2021).

One of the most important features of social networks is their ability to engage users and foster community involvement. Several studies have demonstrated that social networks can be valuable resources for information sharing and collaboration (Toker & Baturay, 2019). The popularity of platforms like YouTube, Instagram, Twitter, and Facebook has amplified the influence of micro-influencers, who have become effective brand spokespersons. Businesses recognize that these micro-influencers are adept at fostering brand loyalty and awareness among their followers as well as promoting community-based initiatives (Lokithasan et al., 2019).

Micro-influencers are regarded as opinion leaders due to their ability to influence followers through persuasive and engaging content (Audrezet et al., 2017). They often become role models for their followers by embodying the ideal self and promoting their cultures, lifestyles and community values. In a study on the influence of Indonesian beauty influencers on Instagram, Puteri (2018) found that micro-influencers were viewed as trusted brand ambassadors and role models because of their authentic and engaging content. Micro-influencers act as intermediaries between brands and followers, effectively bridging the gap with their relatable personas and creating a sense of community among their followers (Lim et al., 2017). However, there is a limited body of research that delves into the specific characteristics of social media influencers that attract and influence followers particularly within community engagement (Ki, 2018).

Millennials, known for being more adaptable, adventurous, and pleasure-seeking compared to previous

generations, present unique challenges for traditional leadership (Akers, 2018). This generational shift has led to numerous studies exploring emerging leadership styles that resonate with millennials. According to Long (2017), servant leadership, ethical leadership, and transformational leadership are particularly inspiring to this demographic. The ideal leadership for millennials often combines elements of servant and ethical leadership, with integrity being a highly valued trait and mentoring a preferred leadership approach. However, Mustomi and Reptiningsih (2020) found that Indonesian millennials tend to favor democratic leadership, a style that Basit et al. (2017) argue is especially beneficial for this group.

When it comes to environmental leadership, millennials are more likely to adopt pro-environmental behaviors advocated by micro-influencers if they perceive tangible benefits from such actions (Naderi & Steenburg, 2018). A recent literature review by Skoric and Zhang (2019) highlighted how micro-influencers have utilized platforms like Weibo to promote environmental consumerism, encouraging the purchase of products based on environmental considerations. This suggests that the effectiveness of micro-influencers as environmental leaders is closely tied to their ability to communicate the personal and collective benefits of sustainable practices by engaging and mobilizing communities toward environmental goals.

Building on this understanding, the narrative persuasion strategies employed by micro-influencers on social media play a critical role in shaping the environmental attitudes and behaviors of their followers. Narrative persuasion catalyzes attitudinal change, particularly among millennials who actively seek information through electronic word-of-mouth (Moyer-Gusé, 2008). Defined as the impact of narrative as a powerful means of influencing beliefs and behaviors, narrative persuasion has been shown to significantly shape the attitudes of those exposed to it (Moyer-Gusé & Dale, 2017). On social media, narrative persuasion includes elements such as transportation, identification, and emotions, all of which play critical roles in its effectiveness. Transportation occurs when audiences become deeply engaged with the narrative's context, while identification requires viewers to relate to and adopt the perspectives of the characters. Emotional engagement further deepens this connection, fostering empathy and driving attitudinal and behavioral changes (Tamul et al., 2019).

The impact of micro-influencers on their followers is also shaped by relationships, particularly parasocial interactions, where followers develop one-sided, yet durable, relationships with influencers. These relationships can significantly influence the persuasive power of the influencer, with parasocial interaction and identification playing key roles (Tsay-Vogel & Schwartz, 2014). Despite the growing influence of micro-influencers, there remains a lack of research on their role as environmental leaders, particularly in encouraging pro-environmental behaviors among Malaysian millennials in higher education and community engagement among Malaysian millennials in higher education.

Studies have shown that micro-influencers use platforms like Weibo to disseminate and exchange opinions on environmental information, influencing followers who often rely on news media to increase their environmental knowledge (Skoric & Zhang, 2019). The credibility of micro-influencers, often determined by their expertise and trustworthiness, is crucial for encouraging pro-environmental intentions among their followers (Awang et al., 2021). However, this finding is contested by Lim, Cheah, and Wong (2017), who argue that micro-influencers credibility alone may not always lead to the desired attitude changes.

On social media, influencers' relatability and confidence are essential for gaining followers' trust, which in turn influences their purchasing intentions and community engagement (Hassan et al., 2021). Being relevant and authentic further enhances an influencer's appeal, making them more effective in connecting brands with consumers and engaging communities. Despite their influence, there is a scarcity of studies on social influencers' roles within non-profit organizations. However, Rathi et al. (2014) suggest that platforms like Facebook can supplement knowledge management for non-profits aiming to reach specific audiences. Moreover, social influencers play an increasingly vital role in promoting sustainable development through their concern, green photo material, and green word-of-mouth (WOM), all of which positively impact followers' pro-environmental behavior (Jalali & Khalid, 2021).

Incentives to take action are often provided by different types of influencers, including idols, experts, lifestylers, activists, and artists, whose credibility and competence are key to boosting pro-environmental behavior among

their followers and community engagement among their followers (Awang et al., 2021). Trust is identified as one of the most crucial characteristics a social media influencer should possess to effectively lead their followers toward environmental consciousness (Okuah et al., 2019). Nafees et al. (2021) further highlight that the strength of social media influencers positively impacts brand awareness and consumer decision-making, with credibility playing a mediating role.

This study aims to investigate the roles of micro-influencers, their use of narrative persuasion, and their impact on pro-environmental behaviors and community engagement among Malaysian millennials. The goal is to develop a framework that highlights the environmental leadership potential of micro-influencers within the context of social media.

3. Methodology

The study involved conducting semi-structured interviews with five social influencers who were identified as Ren, Basil, Fleur, Daisy and Iris. Purposive sampling was employed to select participants, ensuring they were chosen based on their experiences and understanding of the phenomenon under investigation (Rubin & Rubin, 2005). The interview protocol consisted of open-ended questions designed to explore environmental leadership among five Malaysian social influencers. Semi-structured interviews provided a flexible framework that allowed participants to freely share their experiences and insights (Patton, 2002).

The interviews focused on examining the leadership qualities, pro-environmental behaviors, and narrative persuasion strategies of the social influencers. Conducted in both English and Bahasa Melayu, the interviews allowed participants to code-switch between the two languages if they found it challenging to express their thoughts in English. This linguistic flexibility enabled participants to more effectively articulate their perspectives. To ensure that participants were comfortable and prepared for the interviews, they were provided with the questions in advance. Establishing rapport is crucial for obtaining rich data in qualitative interviews (Gill et al., 2008).

The researchers recorded and transcribed the interviews for analysis. Thematic analysis was used to analyze the semi-structured interviews, with transcripts transcribed verbatim to accurately capture the participants' thoughts (Green & Thorogood, 2009). The coding process began with open coding, during which individual codes were generated. As coding progressed, categories and themes emerged, and these were continuously compared with previous codes within similar categories (Glaser, 1978). Following the reduction of data, axial coding was conducted to establish hierarchical relationships between codes, categories, and sub-categories. The initial coding was done manually.

To ensure the validity of the data coding process, peer debriefing was employed. Two experienced qualitative researchers independently coded two interview transcripts using the initial data categories. Their insights were incorporated into the development of the initial data categories. The entire research team collaborated to construct these categories and define each category's meaning.

4. Findings & Discussion

The study reveals three emerging themes: leadership qualities, pro-environmental behaviors, and persuasive narrative strategies, with a particular emphasis on community engagement.

Theme 1: Leadership Qualities

Leadership qualities refer to the ability of Malaysian micro-influencers to authentically influence followers by sharing personal experiences, engaging in pro-environmental activities, and effectively using social media to promote sustainable behaviors. Micro-influencers were conscious leaders who were aware of their visibility to their followers. As a consequence, they utilized their social media platforms such as Instagram and Facebook to promote a sustainable, environmental-friendly lifestyle but also to foster a sense of community around these values. In doing so, micro-influencers showcased to followers products that they used personally in their daily lives. They believed by being genuine, they were able to persuade their followers to follow their behaviors without the micro-influencers being too unpleasantly assertive followers.

As explained by one micro-influencer, "I'm not asking them to buy, just promoting to them. I promote the products because I use them personally and they work. That is why I promote them to others with the hope that they will buy the same products" (Iris). This approach is a form of community engagement, where the micro-influencer not only communicates but also models sustainable behaviors that followers can easily emulate (Ardévol et al., 2021). This method of message transfer, though implicit, effectively allows followers to passively acquire knowledge through the authentic testimonies of micro-influencers (Chwialkowska, 2019; Dekoninck & Schmuck, 2023).

Additionally, the findings align with previous research on the pro-environmental lifestyles of millennials. Millennials who practice a pro-environmental lifestyle do not just consume environmentally-friendly products, they also engage in pro-environmental events and campaigns (Genoveva & Shahrivar, 2020). The study highlights that micro-influencers are proactive in community engagement, participating in green campaigns and events such as webinars (Ren), voluntary trash collection (Iris), and collaborations with non-governmental organizations to compost waste (Fleur). Interestingly, despite their roles as influencers, the participants perceived themselves as trainees to more experienced pro-environmentalists in carrying out more drastic environmental activities or programs. For instance, Iris mentioned that one of her concerns was bureaucratic issues such as "being a government agency so we have to consider a lot of things before taking action". As a result, social media influencers indicated a preference for following the lead of others in more assertive pro-environmental activities or initiatives, such as launching petitions, protests, or demonstrations. As mentioned by one participant, "Most of the time, I follow team leaders...probably when I get enough experiences and learn things from them [I'll lead the activities]" (Basil). This reflects a community-oriented approach where micro-influencers not only lead but also collaborate with others in the community to foster greater environmental impact.

While the study did not specifically explore racial factors, the micro-influencer's cautious approach to initiating aggressive pro-environmental campaigns may be influenced by cultural considerations. A study by Ghazali et al. (2019) revealed that compared to the Chinese, Malays were less open to changes in carrying out pro-environmental behaviors.

Most of the participants agreed that their social media accounts influenced their followers' opinions and behaviors about pro-environmental issues. According to current studies, most of the studies confirmed the impact of social media influencers on followers' environmental protection concepts and behaviors (Awang et al., 2021; Okuah et al., 2019). Some positive attitudes identified that social media influencers influence followers' pro-environmental opinions and behaviors, such as influencing travellers to choose eco-friendly hotels (Kapoor et al., 2022), consolidating the values and actions of pro-environmental behaviors (Nerb & Spada, 2001), and even affecting environmental policy decision-making (Galetti & Costa-Pereira, 2017). However, there were different views when came to the issue of pro-environmental behaviors. According to the research, even though social media influencers had many followers, they could not ensure that they could successfully influence and change people's perceptions (Solis & Webber, 2012). Even if they had environmental concerns, the concerns might not translate into behavioral changes (Kumar, 2016), but there were still plenty of barriers that hindered consumers from adopting green behaviors (Nguyen & Zhang, 2020). Respondents perceived that their social media accounts influenced the opinions and behaviors of their followers. Their confidence came from their followers' feedback (Ren, Daisy), seeing changes in followers' behavior through social media (Fleur), the significant increase in the number of people taking part in pro-environmental activities in the social media group (Iris), and followers shared their posts with others (Ren, Fleur). Micro-influencers play a significant role in community engagement, using their social media platforms to promote environmental consciousness and inspire collective action.

Theme 2: Pro-environmental behaviors

Pro-environmental behaviors refer to the actions and lifestyle choices that individuals, including Malaysian micro-influencers, adopt to reduce their environmental impact, such as recycling, conserving energy, reducing waste, and promoting these practices to others, despite the broader societal challenges and varying levels of environmental awareness. Research has shown that although many people care about the environment, these concerns and positive attitudes may not translate into behavior changes (Kumar, 2016). Encouraging people to embrace green behavior turned out to be challenging (Peattie, 2010). In the United States, neighbors,

families, and friends even ostracized people who adopt a green lifestyle (Bennett & Williams, 2011). Although Malaysian society supports environmental behavior, only a few people practice it. From this study, while most micro-influencers practiced pro-environmental behaviors in their daily lives, the majority of these activities involved practices such as recycling, reducing the use of non-recyclable materials and spreading awareness to colleagues and students about recycling. These findings were common with the research of Razak & Sabri (2019) which showed that the most common pro-environmentally behavior in the workplace performed by employees in Malaysian public organizations was recycling, conserving energy and water, and reducing waste by reusing materials. Also, it is not surprising that recycling was the common pro-environmental behavior practiced by micro-influencers as a study by Ghazali et al. (2019) found that Malays tended to recycle than Chinese. In the case of our study, all micro-influencers that were interviewed were Malays and this could be another possible explanation for their emphasis on recycling. As posited by Ghazali et al. (2019), recycling is seen as a practice that is synonymous with socially good conduct by the Malays. All in all, our findings in terms of the pro-environmental behaviors of micro-influencers showed that Malaysian millennials' pro-environmental behaviors are still at the surface level.

Relatively, the topics of social media influencers from other countries in pro-environmental were more diverse: reviews and recommendations of green products, DIY natural daily necessities and tips on green lifestyles during travel (Chwialkowska, 2019). There are two reasons for this phenomenon: First, compared with developed countries, Malaysia's environmental awareness and pro-environmental-behavioral still low (Yang et al., 2021), several works of literature validated that Malaysians in general lack of willingness to pro-environmental behaviors, understanding of environmental issues is in surface level, pro-environmental awareness and sensitivity are low, awareness of environmental issues of future generation need to be raised (Lim, 2005; Rahman, 2018; Shamsuddin, 2003). Therefore, pro-environmental activities can only start from the basics for this stage. Thus, pro-environmental initiatives at this stage are likely to begin with fundamental actions. However, interviews with micro-influencers revealed that some also paid attention to broader environmental issues. For example, the micro-influencers in our study expressed concerns about topics such as pro-environmental lifestyle habits and the use of natural products (Basil), environmental challenges in university dining (Daisy), marine ecology (Iris), and natural ecosystems (Fleur). As authentic leaders, these micro-influencers focused on sharing pro-environmental knowledge and activities that were personally relevant and familiar to them. This approach, rooted in community engagement, suggests that millennial micro-influencers are particularly driven to address issues within their immediate environment, perhaps due to an awareness of the broader societal gaps in pro-environmental action.

Furthermore, poor societal awareness and development in environmental issues are push factors for millennials in Asia to switch to a more environmentally friendly lifestyle (Genoveva & Syahrivar, 2020). This community-focused approach enhances the impact of social media influencers, as credibility and expertise positively influence audience attitudes and intentions (Awang et al., 2021; Till & Busler, 2000). However, in line with cultural norms, the micro-influencers in this study actively shared pro-environmental behaviors on social media more and continuously and even established specific green lifestyle models for followers to imitate instead of criticizing non-environmental behaviors by others. This approach aligns with the Eastern societal value of modesty, where positive modelling and indirect influence work better than harsh criticism (Maass et al., 1982).

Theme 3: Persuasive narrative strategies

Persuasive narrative strategies are the intentional use of imagery, language, and personal content by Malaysian micro-influencers on social media to effectively promote and encourage pro-environmental behaviors among their followers. The results of this study revealed that Malaysian micro-influencers had a strong awareness of pro-environmental issues. They promoted pro-environmental concepts and activities on their social media. Social media platforms such as Instagram and Facebook played a significant role to social media influencers in persuading and spreading awareness to followers to adopt pro-environmental behaviors. Social media has a big impact on the green consumption habits and aspirations of China's Z generation, which increases their desire for a sustainable environment and lowers their carbon footprints (Chen & Madni, 2023). Imagery such as photos and videos as well as words were used by social media influencers in their persuasion. It was understood from participants' talk that the imagery and words shared were either created by themselves or by sharing other people's posts. Regardless of the source, it was apparent that the images and words shared by

the social media influencers were that of reflected their personal life choices – products or services that they used daily. They constructed the related pictures as evidence, so their contents were more persuasive and influential. For example, Basil mentioned that he would show "what I bought, what I do and what I wear every day" and Daisy, would share the products that she used personally and "show the thing and give information" to followers about them. Notably, social media influencers were mindful of the images and words shared with their followers. Their choices of images and words were focused on carrying positive messages or moral values of pro-environmental behaviors. Because of that, social media influencers preferred sharing positive images and words such as "positive environmental related words" (Daisy) to persuade their followers.

It seems that participants' consciousness of their choices in content curation may encourage their followers to perform systematic rather than superficial thinking in adopting pro-environmental behaviors. The literature has shown that social media influencers may apply the power of positive appeal to create persuasion. In this regard, social media influencers showcase to followers the positive outcomes of performing pro-environmental behaviors (Okuah et al., 2019) similar to them. In a similar vein, Chwialkowska (2019) demonstrated that personalized content such as their green lifestyle shared by social media influencers provided genuine and valid evidence that can persuade followers to adopt pro-environmental behaviors.

This study indicated that micro-influencers in Malaysia showed audience awareness when persuading their followers to implement environmental behaviors. Influential people speak out about what they think is important and draw the attention of their followers to the subject. However, micro-influencers may need to pay attention to communication skills with followers. In terms of "impart values" and "want followers to implement environmental changes", although starting point and motivation are good, micro-influencers need to consider interaction with followers during the process, rather than just a one-way instruction. Otherwise, followers may feel oppressed or have repulsive emotions. According to research, flexible and compromised minorities with moderate rather than extreme views and cooperative attitudes were more likely to influence the majority than rigid and dogmatic minorities (Bazarova et al., 2012). Moreover, a leader needs to cooperate and coordinate with others to achieve success (Green & Leonard, 2019).

The qualitative result also showed that the micro-influencers interviewed were not sensitive to the persuasive narrative strategies they used or had no special planning and ambition. Some of them just presented their daily life practice (Basil), told their followers about the product effect (Fleur), and vigorously promoted pro-environmental activities or campaigns (Ren; Iris). As one interviewee said: "... I show products and provide information... That's what I can do... I don't know how to show... What I can do... Maybe I should practice." (Daisy) This study showed that respondents did not spend too much time on persuasive narrative strategies, and they put more emphasis on pro-environmental products or lifestyle than persuasive narrative strategies. Different persuasive narrative strategies bring different effects, even the application of tags on social media, the use of emojis, the time and frequency of posting, etc., could strengthen social media influencers' impact (Okuah et al., 2019). By adopting these persuasive narrative techniques, Malaysian micro-influencers will strengthen their interaction with their followers which will bring greater impact on the pro-environmental issues within their communities.

5. Conclusion

This study showed that Malaysian micro-influencers agreed that followers trust them because of their product experience, and the quality and attractiveness of the content they shared. They were quite confident in their influence on their followers in pro-environmental protection opinions and behaviors in encouraging community engagement. Throughout Malaysian micro-influencers, there is still space for improvement. As Malaysia's pro-environmental awareness and behavior are still low, Malaysian micro-influencers need to continue to actively and frequently publicize pro-environmental topics. They need to continue using their social influence to enhance environmental awareness and community engagement among technologically savvy societies to tackle issues related to natural resource depletion and environmental disasters.

The persuasive narrative strategies of Malaysian micro-influencers were conservative, which were using the right distribution channels, to impart values and wanted followers to implement environmental changes. This study suggests that Malaysian micro-influencers pay more attention to the use of persuasive narrative

strategies, such as strengthening their interaction with followers. Micro-influencers need to consider active interaction with followers during the process, rather than just a one-way instruction. They need to be able to listen and utilize more feedback from the followers or else they might feel unjust. Next, enhancing the technical and creativity of persuasive narrative strategies, so that there will be more impact on pro-environmental behavior. As previous research revealed, the subject and the content of social media should be stimulating for the followers to emulate the ideas promoted by the social influencers. Other than that, the micro-influencers also need to diversify their content and venture into other environmental issues that might be a bit unfamiliar to them. As the result of this study showed, they only promoted specific environmental scopes that were familiar to them.

As a suggestion, further studies may look at the impact of these narrative strategies used by the influencers as it is not within the scope of our research. In other words, how effective are their efforts in promoting pro-environmental behaviors as the degree of impact of micro-influencers may not be as optimistic as they perceive? Other than that, researchers can also look at how different persuasive narrative strategies (tags, emoji, time and frequency of posting) could strengthen micro-influencers' impact in disseminating green ideas on social media platforms. The result of the effectiveness of these strategies may bring more input in persuading younger generations to exhibit desired environmental actions.

This study contributes to the literature on micro-influencers since there are limited studies on the influence of micro-influencers on the ways they constructed their digital pro-environmental behaviors and environmental leadership. It is essential to comprehend how these micro-environmental leaders support pro-environmental behaviors among Malaysian millennials to increase community involvement and promote an ecologically conscious culture, it is essential to comprehend how these micro-environmental leaders support pro-environmental behaviors among Malaysian millennials.

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Factors Influencing Data Partiality in Artificial Intelligence

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Abstract: This study proposes a conceptual framework to investigate factors influencing the data partiality in Artificial Intelligence (AI). The popularity of AI is world-renowned machines that can represent human intelligence under the program of computer systems. However, the academic research on data partiality focusing on AI is limited across the bibliographic database sources. This study aims to address the gaps by proposing a developed framework that integrates three factors: the AI algorithm, black data, and user revise terminology highlighted in the past literature. The AI algorithm refers to the issues on the training data as a dataset used in the tools, which stimulates the data partiality as the outcome retrieved by the user. The black data is influencing data partiality on the existence of unknown data. The user revise terminology represented on the keywords used by the user to search for information, which incorrect keywords with not specify will lead to the AI to give all related information as an output without filter. The framework asserts that these three elements directly affect the partiality of data in AI. A quantitative methodology will be used in this study to cover the collection of survey data from the community under the MDEC program called Global Online Workforce (GLOW). The framework contributes a theoretical understanding of AI algorithms, black data, and user-revised terminology that influence data partiality in AI. In future research, the framework can be extended to test the data partiality in AI tools used in information agencies, as these bodies govern the safeguards of the accuracy of the information.

Keywords: *Data partiality, artificial intelligence, black data, algorithm, user revise terminology*

1. Introduction

Artificial intelligence (AI) algorithms are widely employed by corporations, political entities, and other groups to make decisions that profoundly impact individuals and society. They might affect everyone, everywhere, at any moment, with their decisions. While artificial intelligence (AI) can solve problems in various domains of daily life, it also carries risks, such as the potential of partial data from the information it receives. Data partiality is neither novel nor exclusive to AI, therefore it is unattainable to eliminate the danger of bias in an AI system (Schwartz et al., 2023). The presence of partial data in artificial intelligence (AI) is a crucial matter that has recently received much focus. AI systems that contain prejudice can result in unintentional ethical, social, and legal problems (Agarwal et al., 2022). Within machine learning, partial data are frequently acquired, resulting in the well-known saying "garbage in, garbage out" (Tempke & Musho, 2022). Research has demonstrated that AI models can possess inherent partial data, which mirrors the underlying inequities in society (Zhou et al., 2024). Addressing partial data in AI is an intricate task because data partiality can be deeply embedded in the data utilized to train AI models (Caliskan et al., 2017). Partial datasets can contribute to the continuation of inequalities.

Moreover, as shown in the news, data partiality is a significant concern from a commercial standpoint, with approximately 22% of firms lacking systematic methods to identify data partiality in AI technologies. (Business Times, 5 January 2024). Even though AI can help a business grow, communicate with customers in real-time, manage operations, and find new ways to innovate and expand, its efficiency is still not fully utilized. In this case, since Malaysia recognizes the significance of AI governance, there is still a need to ensure data partiality in AI training data may be used for good (Saeidnia, 2023). Nowadays, the number of internet users worldwide is more than five billion users. Despite a tenfold rise in the number of websites over the past decade, the quantity of pages indexed by Google has neared 50 billion (Techjury, 2023). Information is rapidly growing in the virtual environment with the internet's widespread use. This is aligned with the statement reported by a

commissioned study by Malaysia Digital Economy Corporation (MDEC) Malaysia's big data analytics market is anticipated to grow to US$ 1.9 billion (RM8.7 billion) by 2025 (Online, 2023). The growing number of users on the internet will then lead to an increased amount of new information being produced, which will cause higher data partiality problems in AI as well. For instance, based on a study made by Lorenz et al. 2024, artificial intelligence ChatGPT, the results about drug allergies aligned with the prevailing allergy and immunology guidelines; however, the chatbot proved to be an untrustworthy information source due to inaccuracies in all the referenced materials. The errors raised are due to data partiality in ChatGPT (Lorenz et al., 2024).

From a previous study, the impact of data partiality in AI results in the exclusion of marginalized library communities can be observed in the context of library and information fields (Kim et al., 2021). The study conducted by Kim et al., 2021, found AI tends to select a range of people by limiting the selection of the material upon the request made by library users. This situation caused partial data obtained from AI, which the AI does not fulfill the library function, which libraries main for a wide range of people to get reference materials. Users depend on libraries to offer impartial and objective information; any evidence of partiality in AI algorithms might erode people's trust. Based on Ferrara (2023), the issue related to partial data in AI led to reinforce preconceptions and discrimination among AI users. This happened when AI was built with various datasets, thus the output is given in search results, procedures, recommendations, and decision making then became partial. For instance, a study conducted by Saeidnia (2023) found that data partiality in AI tools leads to partial datasets in biometric technology, such as facial identification was set to be fair skin faces, the AI having a problem recognizing or verifying users with darker skin faces. Data already set in AI is not reflected as a true output in most situations, and the difference in the result disproportionately impacts specific individuals or groups (Akter et al, 2021).

On top of the issues, previous research found factors that influence data partiality in AI, which were algorithm in AI (Daneshjou et al., 2021), black data (AFM Ajis et al., 2022), and user-revised terminology (Atman Uslu & Yildiz Durak, 2022). According to Daneshjou et al. (2021), the study demonstrated that a lack of clarity in AI algorithms resulted in data partiality inside AI systems. In most AI tools, the algorithms are crafted using training data (Saeidnia, 2023). The algorithm using training data did not mirror the variety of types of data entered by the user, which led AI to select the trained data, which is partial. A suggestion from Chen (2023) stated that it is important to study the algorithm used in AI to identify the presence of partial data. Furthermore, another factor that causes data partiality in AI is black data. Black data is derived from the dark data situation, which refers to the uncontrollable data, which occurs mostly when managing a large amount of data. In information technology fields, the vast amount of data is increasing rapidly, and this has caused problems with the technology tools to manage the data. Those unmanaged data, however, have meaningful meaning based on the situation. The AI tools will give the information based on the user searching action, thus those unmanaged data will be called as well as a result (De La Peña & Granados, 2023). The dissemination of inaccurate information during a commercial transaction can negatively impact the profitability and overall performance of the user of an AI (Ntoutsi et al., 2020). Moreover, every information in the Internet environment has a limited lifespan (Marwala et al., 2015). Inaccurate data containing partial data elements given by AI tools may affect an individual's decision-making. This study will identify the elements of black data that emerged in AI tools that could lead to partial data and disrupt the user decision-making process. On the other hand, the third factor emphasized in this paper that causes data partiality in AI is user-revised terminology. With the development of new online tools, various terms and sometimes combined terms can formulate the terminology captured and processed by AI tools (Jumabek et al., 2024). Consequently, this gives rise to the development of terminology that amalgamates issues from several disciplines and affects the terminology process by an AI. Furthermore, traditional terminology is occasionally modified or augmented with new AI elements to accurately represent modern perspectives and needs (Jumabek et al., 2024). The present scenario gives rise to a lack of consistency and standardization in the terminology, impeding the accessibility of mathematical knowledge for different user groups.

Therefore, this study is intended to discover the factors influencing data partiality in AI. Throughout this paper, three factors were identified: algorithms in AI, black data, and user review terminology.

2. Literature Review

Artificial Intelligence (AI)

Artificial intelligence has become the driving force behind all breakthrough technology in the 20th century. A burgeoning area of technology called artificial intelligence uses models of human brain networks to infer patterns from certain information. Artificial intelligence enables machines to execute tasks that otherwise necessitate human intelligence (Preckel et al., 2020; Schoser, 2023). Artificial intelligence is becoming more prevalent in every field due to its human-like intelligence and capacity for problem-solving. Artificial intelligence is becoming increasingly necessary in the current environment, as computers are used for theoretical and practical purposes. In the context of information management, AI tools are characterized as intelligent systems capable of adapting to their environment while operating with limited knowledge and resources (Wang, 2022). Computational algorithms in artificial intelligence can vary from basic, rule-based directives to intricate methodologies such as machine learning and deep learning (Raj, 2019). For example, these algorithms may be used in pattern recognition, data processing, decision-making, or data-driven learning (Gignac & Szodorai, 2024). Thus, artificial intelligence can be defined operationally as the maximum ability of an artificial system to do a novel standardized task with accurate scoring through computer algorithms.

Data partiality in Artificial Intelligence (AI)

According to Ferrer et al., 2021, data partiality in artificial intelligence (AI) refers to individuals or groups' unfair or unjust treatment because of partiality embedded within AI algorithms or systems. Equitable access to information may be hampered by the employment of AI systems in the information sector, which could reinforce prejudice and inequality. Inaccurate data, skewed decision-making procedures, and opaque AI algorithms are all potential sources of partial data (Saeidnia, 2023). Addressing data partiality and discrimination in AI is crucial for ensuring the completeness and accuracy of information (Ferrer et al., 2021; Akter et al., 2021). This entails analyzing and addressing incomplete data in training datasets, enhancing algorithmic openness and interpretability, engaging various stakeholders in the creation and assessment process, and enforcing ethical standards and rules (Malek, 2022; Gerards & Zuiderveen, 2018). Data partiality and discrimination in AI are not deliberate but stem from the foundational data and algorithms employed (Chen, 2023). If these issues are not resolved, AI systems have the potential to exacerbate already existing inequities and expand gaps in the services provided by the information industry. Advocating for ethical AI practices and emphasizing education and awareness is crucial to mitigate data partiality and guarantee fairness, accountability, and transparency in AI technology within the information economy. Consequently, it is imperative to perpetually assess and enhance AI systems to mitigate the effects of incomplete data and promote justice and equality.

Algorithm in AI

Artificial intelligence algorithms are engineered to render conclusions or forecasts based on patterns and data (Malek, 2022). Nonetheless, these algorithms may unintentionally mirror the data partiality and prejudices inherent in the training data or their programming (Ferrer et al., 2021; Malek, 2022*).* Algorithms are configured so that a computer can process instructions and solve problems*.* According to Akter et al., 2021, Algorithmic bias refers to the phenomenon wherein AI systems generate discriminatory outcomes or decisions that disproportionately impact specific individuals or groups. This may occur when the training data utilized to construct the AI system is incomplete or lacks variety, resulting in biased predictions or recommendations. Furthermore, discrimination in AI may arise when algorithms are employed to make decisions in domains such as recruitment, lending, or criminal justice. These algorithms can sustain or exacerbate discriminatory practices if trained on incomplete data. An AI hiring tool may unintentionally discriminate against specific groups if educated on historical data that embodies biased hiring practices (Ferrer et al., 2021; Akter et al., 2021). These data partialities in AI systems were inherent to the datasets and algorithmic procedures utilized to create AI applications. These issues frequently occur when algorithms are trained on certain data and cannot extrapolate beyond it. The inaccuracy could result from various sources, including heterogeneous data, incorrect data, complicated data represented in simpler mathematical representations, algorithmic partial like over- and under-fitting, handling outliers, data cleaning, and imputation issues.

Black data

Black data in information management refers to data beyond the control of custody, searchability, and awareness, rendering its usage banned, deceptive, or impracticable. This is an entirely opaque data scenario called black data. Black data comprises the following characteristics: unknown and misled data. In the realm of unidentified data, utilizing any artificial intelligence platform to seek information may exacerbate the influence of dark data on business performance and operations. The scenario in which undiscovered data remains unregulated or is in possession yet unrecognized or is beyond the comprehension of the AI provider despite identifiable sources, constituting the origin of the unknown data. In addition, unknown data were derived from uncertain data, defined as data with inconsistent context or unclear meaning, making it impossible to identify and forecast the data's significance or impact. Thus, data partiality came from an information provider such as an AI platform that had a relation with unknown data whereby the receiver or user of information with partial data tends to accept partial information if utilized without critical review. On the other hand, misled data given by the information provider, such as AI tools, could greatly impair the user. Inaccurate information supplied by any party may disrupt corporate operations and incur additional obligations for the organization (Ajis et al., 2022). Misleading information is typically the result of communication errors and arises from asymmetrical data, where the recipient interprets the contextual meaning of the information differently. Therefore, data partiality is related to misled information, as some data is asymmetrical for instance, from the output obtained through various AI tools, the information is inconsistent and contradicts multiple AI tools and others.

User revise terminology

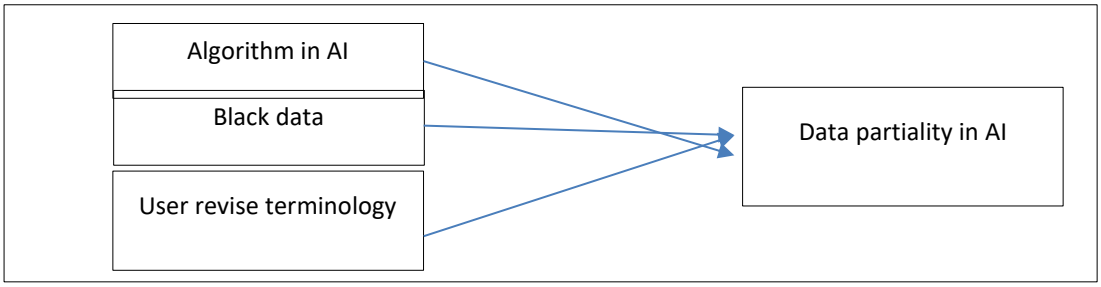
According to Adegbilero-Iwari, Oluwadare and Adegbilero-Iwari (2023), in today lives, finding information and knowledge is a major time-consuming activity for people. Nowadays, the Internet serves as the primary source for information acquisition, as opposed to the conventional printed materials-filled spaces like libraries where information searchers once conducted their business (Sharit, Hern´andez, Czaja, & Pirolli, 2008; Tsai, 2022). Today, individuals will primarily opt for the Internet or AI-integrated search engines, as these tools facilitate access to extensive knowledge with minimal effort (Wellings & Casselden, 2017). Finding information is a complex cognitive activity involving cognitive, metacognitive, problem-solving, and decision-making techniques (Atman Uslu & Yildiz Durak, 2022; Monchaux, Amadieu, Chevalier & Marin´e, 2015). People look up information on any topic on the internet (Canan Güng¨oren, Gür Erdo˘gan, & Kaya Uyanık, 2019).

However, increasing knowledge in online spaces necessitates more adept search techniques (Atman Uslu & Yildiz Durak, 2022). According to Da et al., 2011, searching for information online can direct the user's attention and encourage their behavior toward accepting partial data without evaluating the result. By conducting internet research, one can lessen the likelihood of an information crash by mitigating the partiality present in the information provider ecosystem. This study will investigate the impact of internet searches on the data partiality produced by AI systems. The technology platforms that govern the presentation and retrieval of information online significantly influence user search behaviors and the performance of AI technologies. For instance, Google is a popular search engine that frequently modifies its algorithms and business structures in generally unclear ways to individual users (Mager et al., 2023). Thus, the variety of datasets used by Google search engines could be inaccurate and lead to data partiality. Typical users lack awareness of the mechanisms that determine the data they access, the prioritization of search results, and the selection of related links (Hoeyer et al., 2024). The difficulties multiply when dealing with big language models such as ChatGPT, Bard, or Bing Chat. In this situation, so-called generative artificial intelligence (AI) provides consumers with synthesized information based on the statistical likelihood that a given sentence will answer their query. While AI can quickly generate highly understandable responses, it will also be prone to errors and may be incorrect and complete (Hoeyer et al., 2024). Users might use the same or various keywords, however, the sources of information given by AI tools remain unknown to the user and might cover outdated information as well that contains inherent partial data or skewed information (Bender et al., 2021). The generated reactions may result in diverse repercussions, including perpetuating or amplifying existing prejudices, misattribution, and disinformation.

Proposed Framework

Figure 1 illustrates the proposed conceptual framework that was created for this study. The framework is built upon a comprehensive literature analysis to investigate the elements that impact data biases in artificial intelligence. Accordingly, a systematic literature review proposed a model with three core constructs, namely black data, AI algorithm, and user revise terminology as the Independent Variable (IV) with data partiality in AI as the Dependent Variable (DV).

Figure 1: Proposed conceptual framework



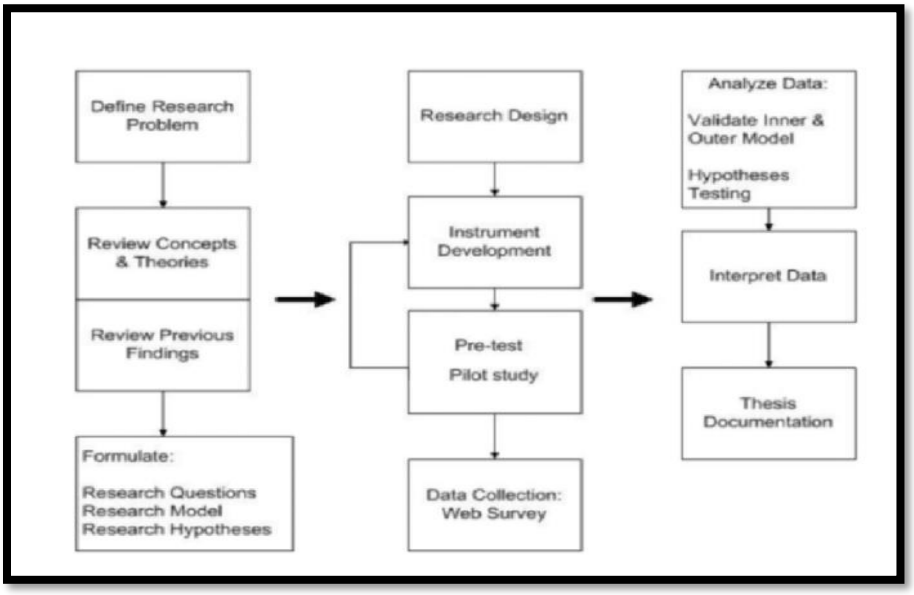
3. Research Methodology

To assess the proposed model, this study will be using a quantitative research design involving statistical analysis of data sets and surveys to evaluate the partiality and accuracy of data used in AI systems within the information industry, as illustrated in Figure 2 (Sekaran, 2003). Therefore, samples of respondents will be selected using purposive sampling, which is among the community practices of using AI applications or systems that only cover one type of AI engine known as the AI chatbot. The scope of the AI chatbot programs will be narrowed down to ChatGPT and Copilot to initiate the investigation before expanding the coverage of more types of chatbot programs. The proposed selected samples are considered expert samples as they are involved in using the AI chatbot programs and teaching it to the community under the MDEC program called Global Online Workforce (GLOW). There will be approximately 646 respondents available for this study.

Survey questionnaires will be used to gather the data sets required for the study. Reliability and validity for the survey will be executed by executing content validity and face validity. This would involve expert review from the field and pilot testing to obtain fine instruments for the study. Further, a few samples from the targeted population will be asked to review the instrument's usability. Afterward, the instrument's reliability will depend on the internal consistency of Cronbach Alpha calculation on the pilot testing datasets.

The data collected will then be analyzed using a few data analysis processes. This study will use descriptive analysis to explore and measure the level of data partiality in AI systems within the information industry. It is also suggested that the data dispersion among findings be explored to investigate variance for each variable and understand the data variability. Further, inferential analysis will also be executed to examine the impact of independent variables on the data partiality in AI systems within the information industry. Besides, correlation analysis is also planned to be executed to understand the relationship among variables and their strength towards each other. However, these would be depending on the normality of the data collected. The software selected to perform the analysis will be Statistical Package for the Social Sciences (SPSS).

Figure 2: Research Process (Sekaran, 2003)



4. Discussion

Data partiality is crucial as artificial intelligence (AI) systems are developed and implemented. These elements significantly influence the efficacy, equity, and dependability of AI applications in various fields. Data partiality is essential to the efficacy and equity of AI systems. To tackle these problems, the data must be carefully chosen, the algorithms must be designed, and the keywords used and other viewpoints must be included in the development process. Various artificial intelligence systems are highly effective but also equitable and reliable by putting strong safeguards in place to identify and reduce prejudice and guarantee data veracity.

It is crucial to study the factors influencing data partiality in artificial intelligence to enhance the data accuracy and completeness obtained from any AI tools available nowadays. Prior research primarily concentrated on using and implementing artificial intelligence across fields, with relatively less focus on highlighting factors causing the data partiality.

Algorithmic partiality is a serious issue that arises when AI systems generate incomplete or unjust results. AI algorithmic partiality is a complex problem that calls for all-encompassing approaches to identify, quantify, and lessen its impacts. Data partiality can be introduced into AI algorithms through their design, which includes the selection of optimization criteria and objective functions. Algorithms optimized for total accuracy could overlook the variations in performance among other subgroups. To address this issue, it is important to create fairness-aware learning algorithms that can intervene at various points in the decision-making process to reduce partial data (Redi & Alameda-Pineda, 2019). Although it may pose difficulties to entirely eradicate partial data from AI systems, ongoing endeavors exist to provide uniform procedures for recognizing and controlling data partiality in AI (Schwartz et al., 2022).

Black data describes information unsuitable for AI systems because it is erroneous, out-of-date, incomplete, or has other flaws. Black data has a substantial and complex impact on the accuracy of artificial intelligence. Additionally, incomplete or inaccurate data can cause models to overfit the flawed data or underfit the actual patterns, which degrade performance. This study is needed to address the issues raised by black data, which involves maintaining data quality, implementing bias detection and mitigation techniques, encouraging transparency and explainability, and abiding by legal and ethical requirements. Prejudices or historical inaccuracies in black data can be learned and reinforced by AI systems, perpetuating data partiality.

Uncertain or poorly defined terminology can cause AI systems to interpret partial data. When disparate data sources employ diverse wording to explain comparable ideas, the lack of standardized terminology might introduce data partiality. AI systems that cannot successfully reconcile the disparities may make partial interpretations and choices due to this contradiction. These technologies' user-revised nomenclature may unintentionally induce biases, producing unfair and discriminating results. This study investigates how terminology contributes to prejudice in AI tools, the consequences of this bias, and methods to lessen its effects.

5. Conclusion and Recommendations

As for the conclusion, this study's findings might help address the factors leading to data partiality in AI systems. Data partiality can hinder the effective implementation of AI tools by providing inaccurate and incomplete data. When considering partiality and fairness, it is crucial to include those who may be directly affected by AI systems in the concerns of the emergence of AI algorithms, black data, and user-revised terminology as for now. It is crucial to examine the concept of accuracy that could result in increased surveillance and data collection on disadvantaged communities.

Additionally, it is essential to recognize the framework developed from this study can be commercialized by providing awareness and training on leveraging data partiality of AI tools hoarded by any information industry. The concept built is relevant to highlight the issues of data partiality in AI tools in the context of data accuracy, which can be implemented to specific domain knowledge. Hence, the untested proposed theory can be tested in future research by focusing on specific information fields such as library AI tools and lead to the emergence of new theory in the context of data partiality in AI from the information management field throughout the development of algorithm or formula to assist in reducing the partiality percentage of data obtain from AI tools.

On the other hand, this paper sheds light on how AI understands various professions, which is important knowledge about the data partiality inherent in AI systems. Given the extent of data partiality in generative AI tools, the AI community needs to take rapid stock of its practices and take corrective action. As our reliance on AI grows, ensuring these technologies are designed and implemented fairly and equally is critical. Creating generative AI systems that are not just technologically sophisticated but also ethically molded by a dedication to equity and inclusivity must be prioritized. By doing this, data partiality could be reduced by not undermining the AI user's objectives with the technology as the information generator.

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The Effect of Price Transparency on Young Travellers' Choices: An Experimental Study of Resort Packages

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Abstract: Product bundling has gained significant traction in the hospitality industry, with an increasing number of businesses offering all-inclusive resort packages to attract consumers. With the increase in online travel purchases, both academics and industry professionals are increasingly interested in understanding the factors influencing consumer travel package choices. This study employs a 2 x 5 mixed-design experiment where participants evaluated both an all-inclusive and a non-inclusive resort, with variations in price presentation. Pricing was presented either transparently or non-transparently, and package savings were displayed in multiple formats. The results reveal a strong consumer preference for all-inclusive resort packages, regardless of the perceived value. Moreover, how pricing information is presented plays a crucial role in shaping consumer purchase decisions. These findings highlight the importance of price presentation strategies in the marketing of travel packages and offer valuable insights for both marketers and practitioners in the hospitality sector.

Keywords: *All-Inclusive Resorts, Price Bundling, Price Presentation, Mixed Design Experiment, Travel Package.*

1. Introduction

Tropical destinations increasingly offer all-inclusive vacation packages to boost tourist arrivals, a trend that is expected to grow (Cozzio, Tokarchuk & Maurer, 2023; Issa & Jayawardena, 2003). The all-inclusive concept is considered a key factor driving the development of resort destinations. But what exactly makes these packages so appealing? Two major components contributing to their popularity are time and value (Tiliute & Condratov, 2014). Vacations are meant to be relaxing, so travellers often seek to minimize the time and effort spent calculating costs. Consumers also expect service providers to handle all their needs. For consumers seeking a stress-free travel experience, choosing an all-inclusive package often feels essential (Tiliute & Condratov, 2014). This trend is especially prominent in today's digital society, where most travel purchases are made directly by travellers online, bypassing traditional intermediaries such as travel agents.

Despite the growing demand for all-inclusive resort packages, there is limited research on how travellers evaluate and choose travel packages online (Kim, Bojanic & Warnick, 2009; Tanford, Baloglu, & Erdem, 2012; Tanford, Erdem, & Baloglu, 2011). Earlier research in service marketing suggests that similar to other service products, consumer choice is influenced by the perceived value of a product bundle (Zeithaml, 1988). Consumers often associate bundling with discounts, expecting bundled products to be more cost-effective than purchasing individual components separately (Heeler, Nguyen & Buff, 2007; Song, Noone & Mattila, 2023).

Bundling multiple products also reduces the effort required for travel planning, offering a clear advantage over searching different channels for the best deals on lodging, food, and activities separately. While there is a clear preference for bundled packages, this raises questions: does the preference hold if the value between bundled and non-bundled packages is the same? How does the presentation of price savings affect consumer choice? Do consumers favor itemized pricing for each component, and can the way savings are presented influence their purchase decisions?

This research aims to answer these questions by exploring the impact of price-saving presentations on consumer preferences for travel packages. Specifically, it investigates the role of all-inclusive resort bundling, price transparency, and savings presentation in shaping purchase decisions for online travel packages. The study seeks to understand the underlying factors that affect consumer decision-making in the online purchasing environment. These insights can help practitioners effectively present their products and services and offer guidance on when to opt for all-inclusive or non-inclusive pricing. Theoretically, this research will contribute to a deeper understanding of price bundling and presentation strategies in the context of online travel purchasing.

2. Literature Review

Package Bundling

When travel operators offer at least two separate products or services at a single price, they are utilizing a marketing tool called bundling (Guiltinan, 1987). Sellers adopt bundling strategies to sell more at lower costs, create added value, and ensure a high level of customer demand. These benefits have enticed the hospitality industry to adopt bundling, offering product packages across segments such as lodging, dining, events, and tours (Naylor & Frank, 2001). As digital transformation continues to shift more travel decisions online, there is growing literature on price bundling in the online purchasing environment.

Carroll, Kwortnik, and Rose (2007) suggested various bundling strategies for hospitality companies to gain a competitive edge. Research by Tanford et al. (2011, 2012) investigated the influence of price transparency, bundling, and the perception of savings on online purchase decisions. Their findings indicate that price is a primary driver of consumer choice, with favorable evaluations of resorts increasing when transparent pricing is used.

Recent studies have further supported these findings, suggesting that consumers purchase a bundle if they perceive it to offer better value than assembling products individually. Wei, Yu, and Li (2024) argue that perceived uniqueness and variability in bundled offers can enhance their appeal, suggesting that customizing packages with exclusive perks (e.g., free activities or upgrades) can increase perceived value. Furthermore, Dominique-Ferreira & Antunes (2020) showed that mixed bundling, where consumers can add optional services, is particularly effective in the hotel sector, as it provides flexibility without overwhelming the consumer with choices.

While bundling reduces search costs, including time, money, and effort, it also minimizes the risk of product incompatibility and leverages volume discounts (Harris & Blair, 2006). However, there are associated risks, such as the potential for waste (not using all components), undesirable elements, and limited freedom of choice. These cost-benefit tradeoffs significantly influence consumer decisions. Xue & Jo (2024) highlighted that time pressure can also play a role in this dynamic, with consumers under time constraints being more inclined to opt for pre-bundled packages as a means of simplifying their decision-making process.

Price Presentation

Price is one of the primary determinants of consumer purchase intentions (Zeithaml, 1988). However, there is still limited understanding of how the presentation of travel package pricing influences consumer decision-making. Two critical factors in price presentation are the amount of information provided and the format of the presentation (Rewtrakunphaiboon & Oppewal, 2008). In their study, they found that students responded more favorably to packages where price was the primary information, although the presentation was sometimes overshadowed by the destination's name. Tanford et al. (2012) found that transparency in information significantly affects consumer decision-making, especially in the context of price.

The amount of price information available on websites, known as rate transparency, can increase or decrease perceived risk. Bai, Chu, Fam & Wei (2022) demonstrated that consumers tend to favor packages where savings are clearly shown, which enhances trust and reduces perceived risk. Detailed price information can heighten consumer evaluations, as it helps them perceive value (Choi & Mattila, 2006). This finding is consistent with Meyer's (1981) notion that incomplete price information leads to higher uncertainty.

The format of price discounts also influences consumer behavior. Recent studies emphasize the importance of discount framing. For instance, Song, Noone, and Mattila (2023) found that presenting bundled offers as "free with purchase" is often more persuasive than standard percentage discounts, particularly for hedonic products like vacations. Similarly, McCabe & Illodo (2019) highlighted that consumers respond positively to "bagging a bargain," suggesting that the psychological appeal of a deal can drive purchasing behavior. These findings extend the earlier research by Munger & Grewal (2001) on framing effects, demonstrating that the method of presenting discounts (e.g., dollar-off, percentage-off, or combined) significantly affects consumer evaluations.

Are We All Natural Misers?

Humans, unlike computers, have limited cognitive processing abilities. Thus, they are constrained by the availability of cognitive effort and time needed for optimal decision-making (Rubinstein, 1988). This leads humans to act as 'cognitive misers' (Fiske & Taylor, 1991), opting for mental shortcuts or heuristics to conserve cognitive resources (Tversky & Kahneman, 1974).

Recent literature continues to support this concept in the context of travel purchases. Jin et al (2022) argue that when consumers evaluate bundled travel packages, they often use simplified evaluation criteria, such as clear savings indicators, to quickly judge value without extensive analysis. This aligns with Shah & Oppenheimer's (2009) theory that people use accessible informational cues to minimize cognitive effort.

In the realm of travel packages, consumers often seek to simplify their thought process by relying on clear, salient information that reduces the need for deliberate thinking. Tanford et al. (2012) found that while itemized prices can decrease uncertainty, they can sometimes complicate the thought process, particularly when savings are not explicitly shown. This is echoed by Wei, Yu, & Li (2024), who suggested that bundling strategies that highlight exclusive perks or savings could act as heuristic cues, guiding consumers towards quicker decision-making.

Building on Fiske and Taylor's (1991) cognitive miser theory, this study seeks to understand how price presentation in all-inclusive travel packages influences consumer decisions in online environments. By incorporating insights from recent studies, it becomes evident that strategies emphasizing transparency, simplicity, and perceived exclusivity are likely to succeed in enhancing consumer evaluations and driving sales. The following hypotheses are therefore postulated:

H1: The presentation of savings (e.g., percentage vs. dollar off) significantly affects the perceived value of an all-inclusive resort package.

H2: Consumers perceive all-inclusive resort packages with non-transparent price presentations (without itemized breakdowns) as more appealing than those with transparent pricing that itemizes each component.

3. Research Methodology

Subjects

The research used a convenience sample of 230 undergraduate students enrolled in a hospitality program at a public university in the southern part of the U.S. state of Nevada. To qualify for the study, participants were required to be at least 18 years old and to have booked or purchased a travel product (such as vacation packages, hotel rooms, or flight tickets) within the past 12 months. This criterion helped ensure that participants had recent experience with travel purchases, making their responses more reflective of real-world behaviors. Participants made a hypothetical travel choice for a Spring Break vacation in Cancun, a destination consistently popular among college students (Brown, 2012; Be, 2014). Given that Spring Break travel is a significant event among college students, this setting was chosen to reflect a realistic scenario where participants would make similar decisions to those they might face in real life.

The demographic profile of the sample was diverse, enhancing the generalizability of the findings within the context of the Spring Break travel market. Nearly half of the participants were seniors (59%), while the remainder consisted of sophomores (15.2%) and juniors (33.9%). The sample included 60% females and 40% males, with the majority (92.6%) aged 29 or younger. The ethnic composition was varied, with 45.2% identifying as Asian, 33.5% as Caucasian, 13.5% as Hispanic, 3.9% as African-American, and 3.9% as other ethnicities. As expected from a student sample, income levels were relatively low, with more than 50% of participants reporting annual earnings below $15,000. This demographic profile not only provided insights into a key segment of the travel market (college students) but also allowed for a better understanding of the preferences and behaviors of younger, budget-conscious travellers.

Design and Procedure

The study employed a 2 (inclusiveness: all-inclusive vs. non-inclusive) × 5 (price presentation format) mixed factorial design. This experimental setup was designed to explore the effects of inclusiveness and various pricing presentations on consumer decision-making, enabling the researchers to analyze both within-subjects

and between-subjects effects.

Manipulation of Inclusiveness: Inclusiveness was manipulated as a within-subjects factor, meaning that each participant was exposed to both an all-inclusive and a non-inclusive resort package scenario. The all-inclusive option presented participants with a total package price covering all essential elements of the vacation (e.g., lodging, meals, beverages, and activities). In contrast, the non-inclusive option displayed the room price per night, with additional costs for meals, beverages, and activities itemized as separate, optional add-ons. This setup allowed for a direct comparison of how participants perceived and evaluated each type of vacation package.

Manipulation of Price Presentation: Price presentation was treated as a between-subjects factor, with five different formats used to explore how the method of displaying prices and savings could influence participants' perceptions and choices:
Scenario A: Control Condition: Neither savings nor itemized prices were provided, offering a straightforward presentation of the all-inclusive package price.
Scenario B: Transparent - Higher Value Condition: This condition displayed a detailed itemization of costs if the components were purchased separately, with the all-inclusive package offering higher value (total cost of components exceeded the package price).
Scenario C: Transparent - Same Value Condition: Similar to the previous condition, but the itemized costs matched the package price, indicating no additional savings, thus testing participants' perceptions when no clear financial advantage was presented.
Scenario D: Dollar Savings Condition: Savings information was presented as a specific dollar amount (e.g., "$150 off") to highlight the financial benefits of the all-inclusive option over the non-inclusive setup.
Scenario E: Percentage Savings Condition: Savings were expressed as a percentage (e.g., "15% off"), offering an alternative framing to the dollar savings condition.
These conditions allowed the researchers to explore how consumers respond to price transparency, explicit savings information, and different ways of framing discounts. Figure 1 below illustrates the full set of price-savings presentations used in the experiment:

Figure 1: Price presentation scenarios

Scenario	Resort A	Resort B
A	All Inclusive 4 Days/3 Nights Package **$ 870** Package includes lodging, all buffet and á la carte meals, unlimited alcoholic and non-alcoholic beverages, and motorized water sports.	Room Rate **$ 190** Per room/night Meals, beverages and motorized water sports can be purchased separately.
B	All Inclusive 4 Days/3 Nights Package **$ 870** Package includes: **Cost if purchased separately** Buffet and á la carte meals $ 105 Unlimited Alcoholic & Non-Alcoholic Beverages $ 105 Motorized Water Sports $ 105	Room Rate **$ 190** Per room/night The following add-ons are available for separate purchase: Onsite Meals $ 50/day Unlimited Alcoholic & Non-Alcoholic Beverages $ 50/day Motorized Water Sports $ 50/day
C	All Inclusive 4 Days/3 Nights Package **$ 870** Package includes: **Cost if purchased separately** Buffet and á la carte meals $ 150 Unlimited Alcoholic & Non-Alcoholic Beverages $ 150 Motorized Water Sports $ 150	Room Rate **$ 190** Per room/night The following add-ons are available for separate purchase: Onsite Meals $ 50/day Unlimited Alcoholic & Non-Alcoholic Beverages $ 50/day Motorized Water Sports $ 50/day
D	All Inclusive 4 Days/3 Nights Package **$ 870** YOU SAVE $150!! Package includes lodging, all buffet and á la carte meals, unlimited alcoholic and non-alcoholic beverages, and motorized water sports.	Room Rate **$ 190** Per room/night **The following add-ons are available for separate purchase:** Onsite Meals $ 50/day Unlimited Alcoholic & Non-Alcoholic Beverages $ 50/day Motorized Water Sports $ 50/day
E	All Inclusive 4 Days/3 Nights Package **$ 870** YOU SAVE 15%!! Package includes lodging, all buffet and á la carte meals, unlimited alcoholic and non-alcoholic beverages, and motorized water sports.	Room Rate **$ 190** Per room/night **The following add-ons are available for separate purchase:** Onsite Meals $ 50/day Unlimited Alcoholic & Non-Alcoholic Beverages $ 50/day Motorized Water Sports $ 50/day

Procedure

The survey was conducted using a pen-and-paper format, and participants were randomly assigned to one of the five price presentation scenarios. Within each assigned scenario, participants viewed a side-by-side display of Resort A (all-inclusive) and Resort B (non-inclusive). The scenarios were distributed across several undergraduate classes at the end of the semester, approximately four months before the Spring Break period, ensuring that the timing was relevant to participants' real-world travel planning.

Random assignment ensured each experimental condition received 43 to 47 participants, meeting the minimum requirement of 39 per group to detect medium-sized differences with 80% power at a 0.05 significance level (Cohen, 1992). Survey packets were prearranged randomly within each class to mitigate selection bias.

Instrument

The survey presented participants with choice scenarios involving two Cancun resorts, one all-inclusive (Resort A) and one non-inclusive (Resort B). Cancun was chosen for its popularity as a Spring Break destination, known for offering a wide variety of all-inclusive packages. Real images of actual resorts from Cancun were used, with modifications to prevent participants from recognizing specific properties, thus ensuring the focus remained on the price presentation and inclusiveness factors. A sample of the stimulus used is illustrated in Figure 2.

Figure 2: Stimulus Sample

RESORT A	RESORT B
	
All-Inclusive Cancún resort near shops, nightlife	Beachfront resort adjacent to Mayan ruin
This newly renovated resort has the biggest white sand beach, a prime location for the only deluxe resort in Cancun offering beach on both sides of the property. The hotel stretches between the vibrant Caribbean Sea and the tranquil waters of the Nichupte Lagoon and is only 6 miles from the Airport and minutes away from restaurants, marinas and night clubs. The resort offers distinguished travelers the opportunity to rejuvenate in the energizing waters of the Caribbean Sea and its white sand beaches. In any of its four inviting pools or the spa. The exhilaration of championship golf, various water activities, and unique culinary experiences makes it the best choice for travelers looking for a renewal vacation experience.	This resort, with its tranquil setting overlooking the turquoise Caribbean Sea, is a truly magical area, where endless days begin. Located on the widest stretch of beach in Cancun, the resort is 5 miles from shopping and dining at Plaza Kukulc. Beaches, pools, and sundecks with thickly cushioned teak lounge chairs provide sunbathing comfort. The health-and-beauty spa offers treatments in air-conditioned rooms, open-air cabins on stilts with raw-pole walls and thatch roofs, and open-air thatched-roof palapas on the beach. Restaurants provide a taste of Mexican, Italian and International specialties. Just minutes from Cancun`s nightlife yet in the middle of paradise, this resort offers the ideal location for your vacation needs
All Inclusive 4 Days/3 Nights Package **$870** Package includes lodging, all buffet and à la carte meals, unlimited alcoholic and non-alcoholic beverages, and motorized water sports. *Terms and conditions apply	Room Rate **$190** Per room/night The following add-ons are available for separate purchase: Onsite Meals $50/day Unlimited Alcoholic & Non-Alcoholic Beverages $50/day Motorized Water Sports $50/day *Terms and conditions apply

YOU SAVE $150!!

Participants were asked to evaluate both resorts on a 7-point Likert scale (ranging from 1 - Strongly Disagree to 7 - Strongly Agree) across the following metrics:
Resort Appeal: "The resort is appealing to me."
Perceived Value: "The resort offers good value for money."
Suitability: "The resort is a good choice for Spring Break."
Price Fairness: "Based on the quality, the price charged is fair."
Likelihood to Choose: A 7-point semantic differential scale from "Highly Unlikely" to "Highly Likely."

These metrics allowed for an in-depth analysis of how inclusiveness and various price presentation formats influenced participants' perceptions and intended purchasing behaviors. The survey concluded with demographic questions to gather background information on participants, including age, gender, ethnicity, and income level.

4. Results

The study analyzed the effects of inclusiveness (all-inclusive vs. non-inclusive) and different price-saving presentation formats on consumer preferences using a 2 (inclusiveness) × 5 (price-saving presentation) repeated measures ANOVA. Inclusiveness (i.e., resort type) was treated as a within-subjects factor, while price presentation was treated as a between-subjects factor.

Main Effects of Inclusiveness

There were significant main effects of inclusiveness on all measured outcomes, including appeal, perceived value, choice, price fairness, and likelihood to choose. The results are summarized in Table 1, indicating that participants consistently reported a more favorable evaluation of the all-inclusive resort across all variables. These findings suggest a strong consumer preference for all-inclusive packages over non-inclusive options. The following are the key findings:

Appeal: Participants rated the all-inclusive resort as more appealing ($M = 5.925$) than the non-inclusive resort ($M = 5.222$), with a significant difference ($F(1,225) = 50.301$, $p < .000$, $\eta^2 = .183$).
Good Value: The all-inclusive resort was perceived as offering better value ($M = 5.580$) compared to the non-inclusive resort ($M = 4.852$), showing a significant effect ($F(1,225) = 38.103$, $p < .000$, $\eta^2 = .145$).
Good Choice: Participants were more inclined to view the all-inclusive resort as a good choice ($M = 5.685$) versus the non-inclusive option ($M = 5.062$), with significant results ($F(1,225) = 29.244$, $p < .000$, $\eta^2 = .115$).
Fairly Priced: The perception of fairness was higher for the all-inclusive resort ($M = 5.513$) than the non-inclusive ($M = 4.800$), showing a significant main effect ($F(1,225) = 32.398$, $p < .000$, $\eta^2 = .126$).
Likelihood to Choose: Participants expressed a stronger likelihood to choose the all-inclusive resort ($M = 5.830$) over the non-inclusive option ($M = 4.672$), demonstrating a highly significant main effect ($F(1,225) = 62.088$, $p < .000$, $\eta^2 = .216$).

These results highlight a consistent trend across all measures, reinforcing the appeal of all-inclusive packages in travel decisions, likely due to the reduced cognitive load and ease of planning they provide.

Table 1: Main Effects for Inclusiveness

Variable	All Inclusive	Non-Inclusive	F	Sig.	η^2
Appeal	5.925	5.222	50.301	.000	.183
Good Value	5.580	4.852	38.103	.000	.145
Good Choice	5.685	5.062	29.244	.000	.115
Fairly Priced	5.513	4.800	32.398	.000	.126
Likelihood to Choose	5.830	4.672	62.088	.000	.216

Note: $p < 0.05$

Interaction Effects Between Inclusiveness and Price Presentation

A significant interaction effect was observed between inclusiveness and price presentation ($F(4, 225) = 4.656$, $p < .005$, $\eta^2 = .068$), indicating that the format of price presentation influenced participants' likelihood to choose differently across the all-inclusive and non-inclusive options. This suggests that consumers' preferences could shift depending on how the price information is presented.

To further understand this interaction, separate analyses were conducted for Resort A (all-inclusive) and Resort B (non-inclusive), focusing on how different price presentation formats impacted consumer evaluations.

Simple Effects of Price Presentation for the All-Inclusive Resort

The simple effects analysis revealed that price presentation significantly affected consumer evaluations of Resort A (the all-inclusive resort). Significant differences were found across the following variables:

Appeal: The analysis indicated significant differences ($F(4, 229) = 3.661$, $p = .007$), with the highest appeal, observed when the package showed percentage savings ($M = 6.41$). Itemized pricing without savings information (transparent-same value) had the lowest appeal ($M = 5.23$).

Good Value: Significant effects were noted for perceived value ($F(4, 229) = 7.192$, $p < .000$). Packages that displayed percentage savings were perceived as offering the highest value ($M = 6.23$), whereas transparent-same value had the lowest ($M = 4.60$).

Good Choice: The likelihood of choosing Resort A as a good choice was higher when savings were shown, particularly in percentage format ($F(4, 229) = 4.345$, $p = .002$).

Fairly Priced: Participants perceived Resort A as more fairly priced when presented with non-transparent packages that showed percentage savings, compared to the transparent-same value ($F(4, 229) = 3.418$, $p = .010$).

Likelihood to Choose: The likelihood to choose was significantly higher for packages that showed percentage savings ($F(4, 229) = 2.504$, $p = .043$), reinforcing that explicit savings information positively influences consumer preference.

Table 2: Simple Effects of Price Presentation for All-Inclusive Resort

Price Presentation	Appeal	Good Value	Good Choice	Fairly Priced	Likelihood to Choose	F	Sig
Package price only	5.83ab	5.57a	5.43ab	5.28ab	5.62ab	3.661	.007
Transparent-same value	5.23a	4.60b	5.00a	4.90a	5.42a	7.192	.000
Transparent-higher value	6.06ab	5.54a	5.68ab	5.60ab	5.94ab	4.345	.002
Dollar savings	6.09ab	5.95a	6.00b	5.77ab	5.98ab	3.418	.010
Percent savings	6.41b	6.23a	6.32b	6.02b	6.20b	2.504	.043

Notes: Means without common subscripts are significantly different at $p < .05$.

Discussion

The purpose of this study was to explore the influence of package bundling and price presentation on consumer evaluation and decision-making. The results indicate a strong preference for all-inclusive resorts over their non-inclusive counterparts. These findings align with Fiske and Taylor's (1991) cognitive miser principle, which posits that humans tend to conserve cognitive resources by using mental shortcuts. Opting for all-inclusive resort packages simplifies travel planning by reducing the need for decisions about meals, beverages, and activities, thus aligning well with the cognitive miser model. This simplification reduces the number of decisions a consumer must make, leading to a more streamlined and stress-free vacation experience.

Preference for All-Inclusive Packages and Cognitive Processing

The observed preference for all-inclusive packages can be attributed to their ability to reduce cognitive load, a finding supported by Jin et al (2022), who emphasized that bundling minimizes consumer search efforts by providing a comprehensive solution that satisfies multiple needs simultaneously. The simplicity of choosing an all-inclusive package appeals to consumers who seek convenience and wish to avoid the hassle of managing separate purchases. This reflects earlier findings by Tversky and Kahneman (1974) on heuristic decision-making, where consumers rely on accessible cues rather than detailed evaluations when making choices.

The findings indicate that consumers prefer revealed savings to itemized pricing information. Revealed savings acted as a heuristic cue, bringing consumers' attention toward the package's perceived value. Previous research by Song, Noone, and Mattila (2023) supports this, demonstrating that framing discounts as percentage savings can significantly enhance perceived value, especially when consumers are presented with a bundle that suggests comprehensive savings. These mental shortcuts are in line with Fiske and Taylor's (1991) theory, which suggests that individuals conserve mental effort by using simplified decision rules.

Impact of Price Transparency and Savings Presentation

The results revealed significant differences when comparing the transparent-same value condition to other price presentation formats. The transparent-same value condition was the only scenario where the all-inclusive package did not show a clear financial advantage over the non-inclusive option. This may have led consumers to perceive less value in the all-inclusive package, as itemized breakdowns can prompt more detailed mental accounting, increasing cognitive effort and reducing the overall appeal. Similar observations were made by Bai et al (2022), who found that consumers are more likely to favor bundled options when the presentation minimizes the need for detailed comparisons between itemized costs.

Interestingly, the most significant differences were observed in the percentage savings condition. Consumers found percentage savings easier to process than itemized components, which require more mental effort to assess. This supports findings from Frisch (1993), who noted that the framing effect can lead to different consumer responses depending on how information is presented. While it might have been expected that dollar savings would be preferred due to their explicit value, the results suggest that percentage formats could be more effective in certain contexts. Wei, Yu, and Li (2024) also observed that consumers perceived bundles with percentage-based savings as offering more value, suggesting that this format makes the savings appear larger and more appealing, even if the actual discount is equivalent to a dollar-off format.

The Role of Heuristics in Consumer Decision-Making

This study builds on the understanding of how cognitive heuristics affect consumer decision-making, particularly in the context of digital purchases. Fiske and Taylor's (1991) cognitive miser theory is further validated by these findings, as consumers are seen to rely on simplified mental shortcuts when making purchasing decisions. Recent work by Le, Carrel, and Shah (2022) highlighted that online shopping environments can overwhelm consumers with information, leading to decision fatigue. Bundling and the presentation of savings in a simplified manner serve as tools to alleviate this cognitive burden by reducing the number of choices and the effort needed to evaluate each option.

In line with Shah and Oppenheimer's (2009) research on the path of least resistance, this study confirms that consumers are inclined to choose options that simplify the decision-making process. By presenting packages in a way that minimizes the need for mental arithmetic (e.g., using clear percentage savings), travel operators can guide consumers toward quicker and more favorable purchasing decisions. This is particularly relevant in online environments where consumers are faced with multiple options and may be more susceptible to simplified cues that suggest value.

5. Managerial Implications and Recommendations

For practitioners, this study suggests that non-transparent, percentage-based savings presentations may be the most effective strategy for promoting all-inclusive packages. Recent industry research by Xue and Jo (2024) supports this notion, indicating that consumers often perceive percentage-based discounts as more substantial than dollar-equivalent savings, even when the actual monetary savings are the same. This preference is likely due to the ease of processing percentage discounts, which consumers can quickly relate to perceived value increases.

Additionally, the results imply that detailed, itemized pricing could deter consumers by increasing the cognitive load required to make decisions. Therefore, travel operators should consider using simplified, bundled pricing presentations that emphasize savings, ideally without breaking down the components unless it is necessary to convey added benefits. This strategy aligns well with the principles of the cognitive miser theory and could

enhance consumer satisfaction and conversion rates.

Directions for Future Research

This study catalyzes future researchers to further explore the context and cues that influence modern consumer behavior, especially in digital purchasing environments. Future research could examine how varying levels of package complexity impact consumer decision-making across different demographic segments, such as families, business travellers, or older consumers. Additionally, exploring how time constraints or urgency affect the preference for bundled packages might provide insights into optimizing marketing strategies. For instance, Xue and Jo (2024) found that time pressure can significantly alter consumer perceptions, making simplified, all-inclusive packages even more appealing.

Future studies could also examine the effectiveness of bundling strategies across different online platforms, such as travel agency websites, direct hotel booking sites, and mobile apps; to identify which digital environments best promote all-inclusive packages. Given the rapid advancement of artificial intelligence and personalized marketing, examining how AI-driven recommendations could refine bundling strategies by tailoring them to individual consumer preferences could be an exciting area of research.

Conclusion

This study contributes to the body of knowledge on consumer decision-making by providing insights into how package bundling and price presentation formats influence perceptions in the online travel market. The findings support the cognitive miser theory, demonstrating that consumers rely on mental shortcuts to simplify their purchasing decisions, particularly when presented with well-structured, easy-to-understand savings information. As the digital purchasing environment continues to evolve, understanding the factors that drive consumer preferences will be crucial for travel operators looking to optimize their marketing strategies and enhance customer satisfaction.

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