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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, South Africa and Indonesia. Unveiling the Trajectory of Board Diversity Research, Emerging Trends in Sustainable Entrepreneurial Behaviour, Factors Influencing Job Performance among Academic Staff, Investigating Factors Affecting Fans' Intention to Attend Anime Events, Entrepreneurial Specific Factors, Support Factors and Micro enterprises Performance, Predictors of Severe Anxiety Among Bumiputera Students, The Impact of Stock Market Development on Economic Growth, Exploring the Usability and Engagement of Students in an Educational Board Game, Circular Supply Chain Management in Developing Countries, Successful Leadership Styles from the Lense of Qualitative Perspective, Integrating Technology in Government Internal Audit, Impact of Social Trust, Social Network and Financial Innovation on the Financial Well-Being of Micro-Entrepreneurs, Relationship Between Digital Technology and Business Innovation Model, Perceived Organisational Support, Transformational Leadership and Organisational Performance, Conceptual Framework on Factors Influencing Nurses' Job Performance, Policies Improving the Well-Being of Gig Workers, Impact of Blockchain in Financial Industry, Uncovering the Significance of Transformational Leadership in Islamic-Based Institutions, Trend of Halal Cosmetics Supply Chain Research, Factors Influencing Knowledge-Sharing Behavior Among Academicians, Religious Practices Position in Firm Performance, Conceptual Framework for the Individual Factors Fostering the Innovative Work Behaviour, Unveiling the Nexus Between Intellectual Capital Efficiency, Financial Performance, Microcredit Clients' Financial Literacy, Elevating Financial Literacy among Women Entrepreneurs, Acceptance Factors Affecting the Intention to Use Mobile Payments and Supply Chain Limitations in the South African Engineering Sector 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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PAPERS

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Unveiling the Trajectory of Board Diversity Research: A Bibliometric Study

Roshidah Safeei[1]*, Azyyati Anuar[2], Wan Adibah Wan Ismail[1] & Nor Azrina Mohd Yusof[1]
[1]Faculty of Accountancy, Universiti Teknologi MARA Cawangan Kedah, Kampus Sungai Petani, Malaysia
[2]Department of Business Studies, Faculty of Business and Management, Universiti Teknologi MARA Cawangan Kedah, Kampus Sungai Petani, Malaysia
roshidah112@uitm.edu.my*, azyyati@uitm.edu.my, wadibah@uitm.edu.my, yina1437@uitm.edu.my

Abstract: This study aims to investigate board diversity using bibliometric analysis. This study examines publication sources, authorship, citations, distribution of publications, and other bibliometric indicators. This study focuses on 290 articles published from 2013 to 2022. Using an automated process, these articles were extracted from the Scopus database and analyzed using bibliometric indicator analysis, VOSviewer, Microsoft Excel, OpenRefine and Perish or Publish. A total of 290 research articles and reviews on board diversity were included in this study. The present study found that the United States was the most productive country (n = 61), followed by the United Kingdom (n = 42), Australia (n = 29), and China (n = 27). The Centre National de la Recherche Scientifique (CNRS), France (n = 8) was the most prominent institution. This study unveils relevant articles, authors, and journals that have discussed board diversity. This study's findings can inform practitioners of the state of the art and the particulars of the most prolific studies. In addition, this study aims to clarify the project themes and tools utilized most frequently in these works. The locations of influential articles and their authors are disclosed. In addition, a list of often-used terms aids in developing a research agenda that highlights pertinent themes, methods, and industries.

Keywords: *Board diversity, corporate governance, board composition, bibliometric analysis, Scopus database.*

1. Introduction

Board diversity represents different backgrounds, experiences, perspectives, and characteristics on a corporate board of directors. This can include diversity in terms of gender, race, ethnicity, age, education, professional background, industry experience, and cultural background. Research has shown that board diversity can positively impact organizational performance, innovation, decision-making, and risk management. For instance, Bussoli et al. (2023) showed board gender and age diversity positively influenced bank social performance in 46 European banks. Diverse boards can better understand and respond to the needs and preferences of various stakeholders, including customers, employees, investors, and the wider community. Additionally, board diversity can help mitigate the risk of groupthink (Ferreira, 2010) and enhance the quality of board discussions and decision-making (Anderson et al., 2011). However, achieving board diversity can be challenging, as it often requires overcoming structural and systemic barriers, such as unconscious biases and limited networks (Erhardt et al., 2003; Huse et al., 2009).

In response to the persistent challenges of boardroom diversity, many organizations have taken proactive measures by implementing diversity and inclusion initiatives to foster a more inclusive and diverse composition of boards (Konrad et al., 2008). These initiatives reflect the growing recognition of the importance of diverse perspectives, experiences, and backgrounds in decision-making processes and the need to address historical disparities in board representation. Such efforts are intended to promote inclusivity, equity, and fairness in corporate governance and capitalize on the potential benefits of board diversity, including improved decision-making, innovation, and stakeholder engagement (Campbell & Minguez-Vera, 2008; Ferreira, 2015). However, despite the increasing emphasis on diversity in practice and research, the evolution and impact of these initiatives remain complex and multifaceted, warranting a comprehensive investigation using bibliometric analysis to explore the scholarly landscape and uncover research development and dissemination patterns in this field.

Board diversity is complex and multifaceted, and various factors may shape the development and dissemination of research in this field. Bibliometric analysis is better for comprehending the scholarly landscape of board diversity research. The bibliometric analysis involves quantitatively examining publications, such as articles and journals, to identify patterns, trends, and relationships among scholarly works. By applying bibliometric analysis, researchers can gain a deeper understanding of the research

development and dissemination of diversity. Bibliometric analysis can help uncover meaningful insights, such as research trends, citation patterns, collaboration networks, content analysis, and impact assessment. By systematically examining these aspects, researchers can obtain a comprehensive overview of the scholarly landscape of board diversity research, identify gaps or areas of potential future research, and contribute to advancing knowledge in this field.

Consequently, this study's objectives are as follows: Using bibliometric analysis, this study first examines the trends and productivity of research on board diversity. This analysis is a technique that examines all articles that contain the specified keywords and sorts them by document and source type, publication year, language, topic, and most active source titles. For this study, a bibliometric analysis will be conducted from 2013 through 2022. The second objective of this study is to examine the cluster analysis of one co-occurrence network. This means that the bibliometric study considers the keywords of the reviewed publications and examines which keywords and words from titles and abstracts appear frequently in the same article. The third objective is to synthesize research trends on board diversity, with a focus on publication and authorship geographical distribution. This study's insights can inform policy and practice related to board diversity by identifying research gaps and areas requiring further investigation, guiding policymakers in designing targeted interventions, and reporting practitioners and researchers on potential focus areas for future research and practice initiatives.

The following section is divided into five sections: The second section provides a concise literature review regarding board diversity. The third section discusses the methodology employed in this current study. The fourth and fifth sections describe the data analysis, results, conclusion, and recommendations.

2. Literature Review

In the literature on corporate governance, Walt and Ingley (2003) defined board diversity as "board composition and the diverse combination of attributes, characteristics, and expertise contributed by individual board members to board processes and decisions" (p. 219). Other scholars define board diversity as the heterogeneity of board members, which can be visible or non-visible and consist of numerous dimensions, such as age, nationality, gender, religious background, educational background, and industry experience (Knippenberg et al., 2007). Both definitions include the notion that differences in board member attributes, values, and perceptions allow for better board decisions because the board can engage in in-depth discussions and generate multiple solutions to the problems at hand (Hartmann & Carmenate, 2020). Gender-balanced board composition can increase board effectiveness by bringing diverse perspectives. On the other hand, homogeneous boards tend to share the same viewpoints and impede quality deliberations and effective decision-making. Julizaerma and Sori (2012) defined gender diversity as utilizing men's and women's diverse characteristics and skills to the firm's advantage. When multiple women are in the boardroom, the diversity can be used to its full potential. Consequently, this circumstance can lead to board effectiveness and high company performance.

Two primary dimensions characterize the board's diversity: demographic and cognitive (Al-Qahtani & Elgharbawy, 2020; Baker et al., 2020). Kagzi and Guha (2018b) added the dimension of diversity to the board structure. The demographic dimension includes age, nationality, gender, personality, cultural values, and information processing style, while the cognitive dimension consists of organizational position, occupation, skills, specialized knowledge, and family role (Al-Qahtani & Elgharbawy, 2020). Furthermore, Anderson et al. (2011) classified the variations in board diversity into two categories of heterogeneity. The first category is occupational diversity, which includes education, experience, and occupation. The second category is social heterogeneity, which includes age, gender, and ethnicity. Broadly, board diversity refers to various characteristics or dimensions of board composition (Gordini & Rancati, 2017; Kagzi & Guha, 2018a). It also refers to the board's demographic, human, and social capital, including gender, age, education, ethnicity, gender, experience, and tenure (Goyal et al., 2019). At the same time, Ali et al. (2020) classified board diversity as relational and task related. Age and gender make up the diversity in relationships. Board members' cognitive abilities, knowledge, tenure, expertise, education, and skills are related to task-related diversity. Thus, Jouber (2021) defined board diversity as the heterogeneity of board members.

A company must have different board members with diverse backgrounds and characteristics regarding board diversity. Due to differences in board member qualities, morals, and perspectives, better board decisions will be made due to diverse perspectives and problem-solving approaches (Hartmann & Carmenate, 2021). This can contribute to the success of a business (Hassan & Marimuthu, 2018). Hassan and Marimuthu (2018) examined the impact of demographic diversity on the performance of upper-level management, including gender, ethnic, and Muslim diversity. They discovered a positive correlation between gender diversity and firm performance in a sample of 529 Malaysian listed firms in 2013. The study indicated that board diversity can boost company performance (Hassan & Marimuthu, 2018). Schopohl et al. (2021) suggested that companies and policymakers must consider not only the gender of executives but also the diversity of the board and the CEO's power to increase women's managerial discretion and permit female leaders to influence corporate policies.

According to intergroup contact theory and the cognitive resource diversity perspective, diversity may result in more creative problem-solving (Harjoto et al., 2019). As predicted by social categorization theory, diversity may result in a lack of cooperation and cohesion, affecting group decision-making (Harjoto et al., 2019). The premise that diversity influences performance through a broader pool of candidates for director positions results in the selection of directors with more vital knowledge, skills, the capacity and willingness to exert effort, and a change in board dynamics (Wahid, 2019). The interpersonal dynamics between the executive management team and the board of directors would be reflected in the demographic similarity or dissimilarity between these individuals, which could exacerbate or enhance monitoring activity (Lee, 2015). Moreover, Bernile et al. (2018) examined the effect of board diversity on corporate policies and risk. Age, gender, race, financial expertise, the number of directorships, and educational background were examined as multidimensional measures of board diversity in the study. Using a sample of all non-financial and non-utility firms in the United States from 1996 to 2014, the study found that greater board diversity leads to less volatility and better performance. The study demonstrated that diverse backgrounds acting as a governance mechanism, moderating decisions, and reducing groupthink-related issues reduce stock return volatility. In addition, companies with diverse boards are more likely to adopt more stable and consistent rules and board decisions are less susceptible to eccentricities. Greater director diversity increases firm profitability and valuations (Bernile et al., 2018).

Therefore, the gap in the study from the provided explanation is that it focuses specifically on the effect of board diversity on corporate policies and risk, with a focus on multidimensional measures of board diversity such as age, gender, race, financial expertise, number of directorships, and educational background. It also highlights the positive impacts of board diversity on reducing stock return volatility, moderating decisions, and improving firm profitability and valuations. However, the explanation does not mention any analysis or insights related to the evolution and impact of diversity and inclusion initiatives or the use of bibliometric analysis to explore the scholarly landscape and uncover patterns of research development and dissemination in the field of board diversity. Thus, the gap in the study is the lack of a comprehensive investigation into the evolution and impact of board diversity research using bibliometric analysis, which could provide additional insights and understanding of the field.

3. Methods

This study employs the bibliometric analysis method to evaluate contemporary developments in board diversity. Specifically, this study utilizes network visualization and bibliometric indicators to present the analysis findings.

Bibliometric Analysis: Bibliometric analysis is a quantitative research method used to evaluate the characteristics of scientific publications, such as articles, journals, or authors, based on their citations and other bibliographic data. This method is widely used in academic research to assess the impact, productivity, and trends in specific fields or disciplines. The bibliometric analysis involves various statistical techniques to identify patterns and relationships among scientific publications, including citation, co-citation, bibliographic coupling, and network analysis. By analyzing bibliometric data, researchers can identify influential authors, highly cited publications, emerging research topics, and critical research collaborations within a particular field.

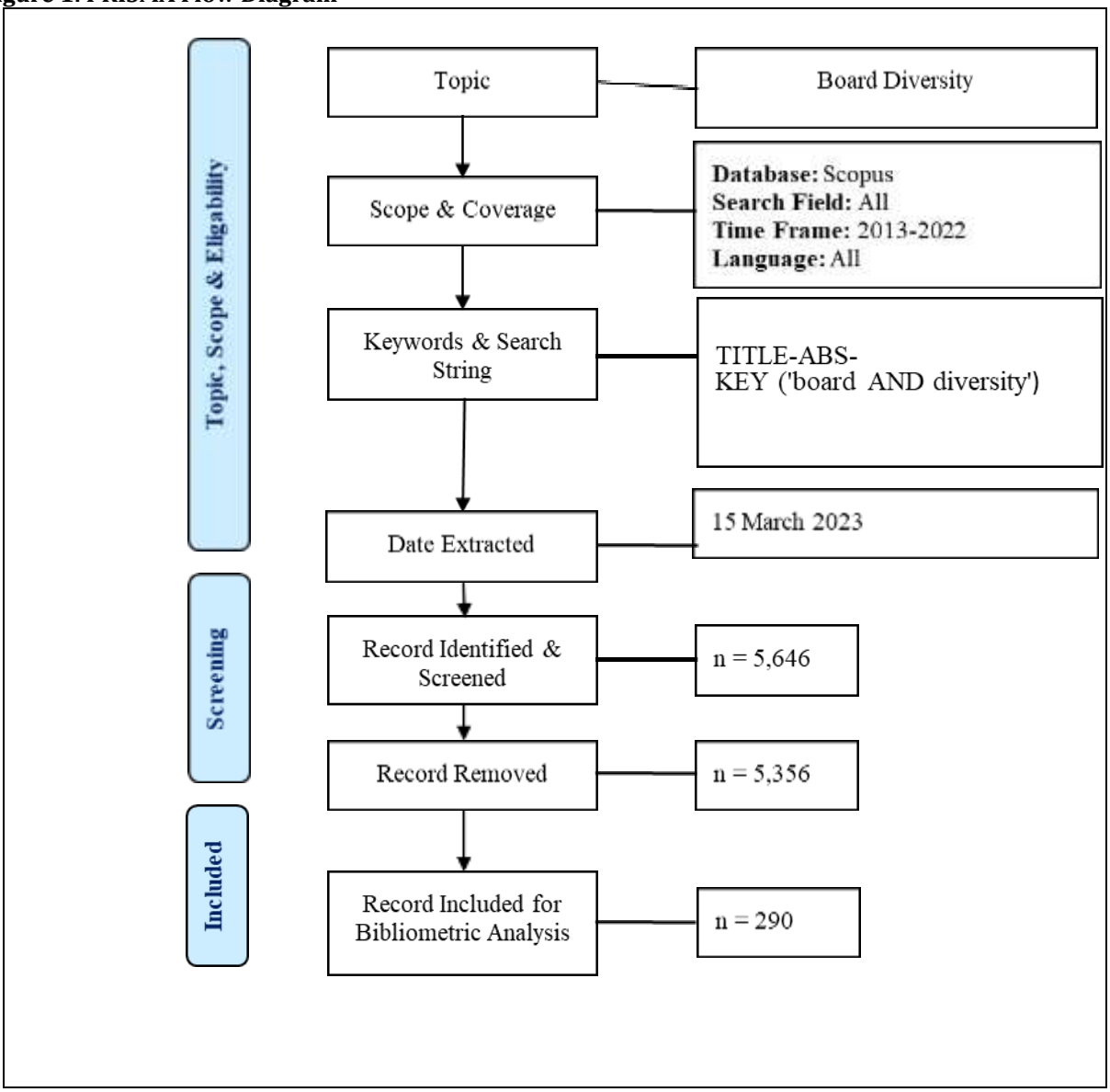
Bibliometric analysis has been used in numerous fields, including environmental science, economics, and social sciences. For example, a bibliometric analysis conducted by Sordan et al. (2020) evaluated the research trends of Lean Six Sigma in the manufacturing process over sixteen years, identifying key research themes and the most influential authors in the field. In another study, Anuar et al. (2022) employed bibliometric analysis to assess the research trends in immigration and environmental degradation, identifying the most cited articles and the most active authors. Overall, bibliometric analysis is a valuable tool for understanding the development and trends in academic research, allowing for the identification of key players and emerging themes in a particular field.

In this current study, VOSviewer was employed as a freely available tool to conduct bibliometric analysis by constructing and visualizing networks (vosviewer.com). This software utilizes citation data extracted from established databases, Scopus, and standardizes the weights of the links by number and total strength to represent the nodal network graphically. The size of the nodes and interconnecting lines represent the significance and strength of the links (Donthu et al., 2021). Additionally, VOSviewer was utilized to create a visualization of network co-occurrence based on the extracted terms from the literature review. A threshold indicating the minimum number of keywords required to be present in a paper was also set (Ciano et al., 2019).

Furthermore, in this study, Harzing's Publish or Perish, Microsoft Excel, and OpenRefine were employed as data analysis and manipulation tools. This established software program is designed to retrieve and analyze academic citations, enabling individual academics to demonstrate the impact of their research even with limited citations. Moreover, it can be used in bibliometric research (Harzing.com). Microsoft Excel can be a valuable tool for conducting bibliometric analysis, which is the quantitative study of publication patterns, citations, and collaboration in academic literature. Excel offers several functions to help organize, analyze, and visualize bibliometric data. Here are some functions of Microsoft Excel for conducting. Meanwhile, OpenRefine is a powerful open-source tool that can be used for data cleaning, transformation, and exploration, which can help conduct bibliometric analysis. Therefore, using VOSviewer, Publish or Perish, Microsoft Excel, and OpenRefine, this study further examined the influence of publications as measured by the number of citations, the impact of each publication, and the number of citations for each publication.

Source and Data Collection: The Scopus database was employed for the bibliometric analysis to extract the required data, owing to its ability to provide bibliometric indicators swiftly and conveniently (Sweileh et al., 2018). With its extensive collection of approximately 5,646 titles, Scopus is recognized as one of the foremost academic databases, making it the primary source for data collection in this study. This review's topical scope was limited to board diversity globally. As shown in Figure 1, the authors followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines for the document search (Moher et al., 2009). A series of investigations were performed using various permutations of the following keyword string: (TITLE-ABS-KEY (“board AND diversity”). This Scopus search yielded 5,646 documents (see Figure 1) and was conducted on March 15, 2023. Next, the list of 5,646 documents was filtered by including (1) publications from 2013 until 2022 and (2) papers that satisfy the concept of global board diversity. Finally, 290 documents were generated and thoroughly analyzed by eliminating 5,356 documents. Additional analysis was carried out with the assistance of various software applications, including Harzing Publish or Perish, Microsoft Excel, OpenRefine, and VOSviewer.

Figure 1: PRISMA Flow Diagram



Source: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *PLoS Med* 6(7): e1000097. doi:10.1371/journal. pmed1000097.

4. Results

The extracted academic work was analyzed based on the following attributes: research productivity, document and source type, document language, subject area, most active source title, publication distribution by country, most active institutions, authorship analysis, keyword analysis, title and abstract analysis, and citation analysis. The findings also included annual growth data through 2022, including their frequency and percentage.

Document and Source Types: The types of documents and sources in which the research on board diversity was published were analyzed further. Table 1 shows that the majority of studies on board diversity were dominated by articles (70.34 percent), followed by conference papers (10.69 percent) and book chapters (8.28 percent). Smaller numbers of reviews (4.83 percent), editorials (2.41 percent), books 2.07 percent), and notes

(0.69 percent were also present. Interestingly, only one data paper (0.34 percent) and one erratum (0.34 percent) were discovered in the relevant literature.

The preponderance of articles in the literature on board diversity suggests that researchers in this field are primarily concerned with empirical research and data analysis. The relatively low number of reviews and books in this field suggests a need for more comprehensive and synthesized works.

Table 1: Document Type

Document Type	Total Publications (TP)	Percentage (%)
Article	204	70.34%
Conference Paper	31	10.69%
Book Chapter	24	8.28%
Review	14	4.83%
Editorial	7	2.41%
Book	6	2.07%
Note	2	0.69%
Data Paper	1	0.34%
Erratum	1	0.34%
Total	290	100.00

This study also revealed that these documents fall into four distinct source types: journals, conference proceedings, books, and book series (see Table 2). 78.97% of the 290 documents are published in journals, 9.66% in conference proceedings, 8.97% in books, and 2.41% in book series.

Table 2: Source Type

Source Type	Total Publications (TP)	Percentage (%)
Journal	229	78.97%
Conference Proceeding	28	9.66%
Book	26	8.97%
Book Series	7	2.41%
Total	290	100.00

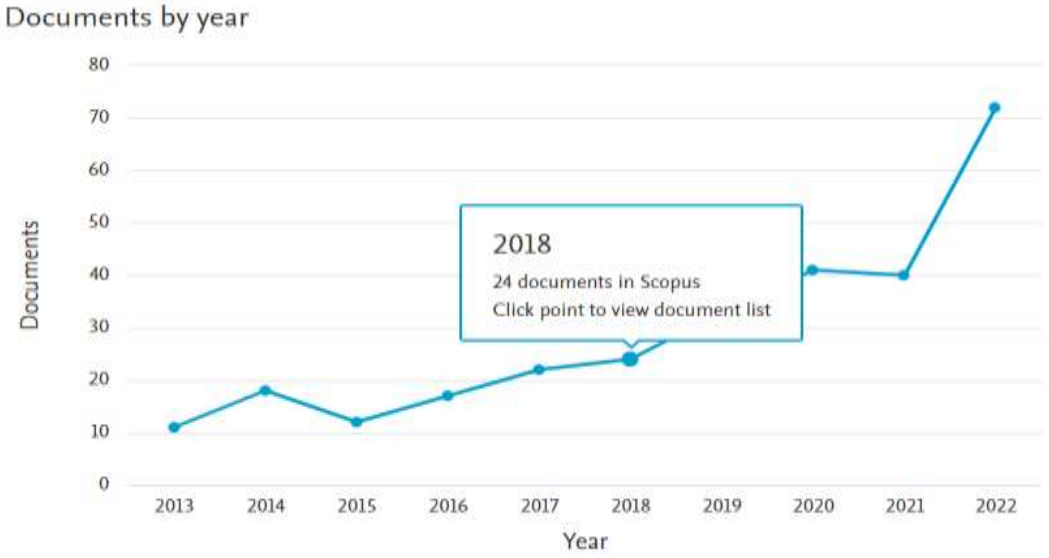
Year of Publications/Evolution of Published Studies: This study examines research productivity based on the number of documents generated annually. Publication year analysis of the documents allows the researcher to comprehend the topic's development over time (Ahmi & Mohamad, 2019). As shown in Table 3, the number of articles published in this field peaked in 2022, with 72 (24.83 percent). They were followed by 2021 (13.79 percent), 2020 (14.14 percent), 2019 (11.38 percent), and 2018 (8.28 percent). (8.02 percent). In contrast, only 3.79 percent of the total publications on this topic or theme were produced in 2013. Figure 2 depicts the growth of this subject's publication activity from 2013 to 2022 using a similar graph format. It would appear, based on the pattern and growth, that scholars have become more interested in board diversity. This is a surprising outcome.

Table 3: Year of Publications

Year	Total Publications	Percentage (%)
2022	72	24.83%
2021	40	13.79%
2020	41	14.14%
2019	33	11.38%
2018	24	8.28%
2017	22	7.59%
2016	17	5.86%

2015	12	4.14%
2014	18	6.21%
2013	11	3.79%
Total	290	100.00

Figure 2: Document by Year



Document Languages: The collected data sets were also analyzed to determine the language used in the published documents. As shown in Table 4, most publications on board diversity are written in English (97.94 percent). Intriguingly, some publications were written in languages other than English, including Chinese, Spanish, German, and Russian. However, German and Russian had the lowest percentage of publications (0.34 percent) of any language.

Table 4: Languages Used in Publishing

Language	Total Publications*	Percentage (%)
English	285	97.94%
Chinese	2	0.69%
Spanish	2	0.69%
German	1	0.34%
Russian	1	0.34%

*One document has been prepared in dual languages.

Subject Area: The publications are summarised in Table 5 by subject area. It demonstrates that with 116 (40.00 percent) publications, "business, management, and accounting" had the most publications. This is followed by "social science" (29.66 percent), "economics, econometrics, and finance" (25.17 percent), "environment science" (13.10 percent), “engineering” (12.41 percent) and "computer science" (10.69 percent). Other subject areas, such as agricultural and biological sciences, medicine, arts and humanities, earth and planetary sciences, energy, decision sciences, physics and astronomy, mathematics, psychology, and multidisciplinary, accounted for less than 10% of the total publications. Board diversity is a global phenomenon, so the focus is primarily on business, management, and accounting.

Table 5: Subject Area

Subject Area	Total Publications	Percentage (%)
Business, Management and Accounting	116	40.00%
Social Sciences	86	29.66%
Economics, Econometrics and Finance	73	25.17%
Environmental Science	38	13.10%
Engineering	36	12.41%
Computer Science	31	10.69%
Agricultural and Biological Sciences	25	8.62%
Medicine	24	8.28%
Arts and Humanities	17	5.86%
Earth and Planetary Sciences	17	5.86%
Energy	15	5.17%
Decision Sciences	10	3.45%
Physics and Astronomy	10	3.45%
Mathematics	9	3.10%
Psychology	6	2.07%
Multidisciplinary	5	1.72%

Most Active Source Titles: Table 6 specifies the most popular board diversity source titles. However, the total number of publications displayed in this table is quite impressive because Sustainability Switzerland is the source of 6 (2.07 percent) of them. Corporate Governance Bingley ranked second with five publications. Corporate Social Responsibility and Environmental Management, Effective Directors the Right Questions to Ask and Journal of Cleaner Production ranked third with four publications each. Other journals contributing to publications on board diversity include ASEE Annual Conference and Exposition Conference Proceedings, Cogent Business and Management Gender in Management, Icarus and Social Responsibility Journal, with a total of nine (1.03 percent). Whereas Accounting Education, Animal, BMJ Open and British Accounting Review were the least prolific sources, with two publications (0.69 percent).

Table 6: Most Active Source Title

Source Title	Total Publications	Percentage (%)
Sustainability Switzerland	6	2.07%
Corporate Governance Bingley	5	1.72%
Corporate Social Responsibility and Environmental Management	4	1.38%
Effective Directors: the Right Questions to Ask	4	1.38%
Journal Of Cleaner Production	4	1.38%
ASEE Annual Conference and Exposition Conference Proceedings	3	1.03%
Cogent Business and Management	3	1.03%
Gender In Management	3	1.03%
Icarus	3	1.03%
Social Responsibility Journal	3	1.03%
Accounting Education	2	0.69%
Animal	2	0.69%
BMJ Open	2	0.69%
British Accounting Review	2	0.69%

Keywords Analysis: Table 7 displays the most prominent keywords that emerged from the bibliometric search. This study examines the most prominent keywords used to categorize particular subject areas. Corporate governance, gender diversity, human, board diversity and board gender diversity were some of the most prevalent and frequently used keywords in relevant publications. This study further analyses the author's keywords by generating a word cloud using WordSift (WordSift.org 2021) with a maximum of 100 words and a scale setting; Figure 3 depicts the result of a word cloud generated with n scale settings. The chart displayed the top 100 words (or keyword phrases) utilized in the published article on board diversity. The size of each word characterizes the frequency of each keyword. Despite the keyword used to search the document's title,

the word cloud also displays other emerging keywords, including board, gender, and diversity. Furthermore, small-sized words made a significant contribution to the research topic of board diversity. It is essential to note that all the terms generated in Figure 3 are popular or trending terms associated with research on board diversity. Thus, we can anticipate that future research will focus on these keywords.

Table 7: Top Keywords

Author Keywords	Total Publications	Percentage (%)
Corporate Governance	53	18.28%
Gender Diversity	42	14.48%
Human	23	7.93%
Board Diversity	18	6.21%
Board Gender Diversity	18	6.21%
Humans	18	6.21%
Article	15	5.17%
Corporate Social Responsibility	15	5.17%
Female	15	5.17%
Board Of Directors	14	4.83%
Diversity	12	4.14%
Sustainability	10	3.45%
Sustainable Development	10	3.45%
Gender	9	3.10%
Leadership	9	3.10%
Male	9	3.10%
Biodiversity	8	2.76%
Board Composition	8	2.76%
China	8	2.76%
Climate Change	8	2.76%

Figure 3: Word Cloud of the keywords



Publication Geographical Distribution - Most Influential Countries: This study also identifies the countries that have published the most documents on board diversity. According to recent academic sources, Table 8 illustrates the top 20 countries contributing to publications in a particular field as of 2022. The table presents the total number of publications and their respective contribution percentages to the field. The United States leads with 61 publications, accounting for 21.03% of the total publications. The United Kingdom follows closely with 42 publications, which account for 14.48% of the total publications. Other countries in the top five include Australia with 29 publications (10.00%), China with 27 publications (9.31%), and Spain with 24 publications (8.28%). The remaining countries in the top 20, including Malaysia, Canada, France, New Zealand, Italy, Germany, India, the United Arab Emirates, Japan, Nigeria, Turkey, Indonesia, the Netherlands, Pakistan, and Switzerland, contributed significantly to the field, with publications ranging from 6 to 19 and accounting for a total percentage of 60.69%.

Table 8: Top 20 Countries Contributed to the Publications

Country	Total Publications	Percentage (%)
United States	61	21.03%
United Kingdom	42	14.48%
Australia	29	10.00%
China	27	9.31%
Spain	24	8.28%
Malaysia	19	6.55%
Canada	18	6.21%
France	18	6.21%
New Zealand	17	5.86%
Italy	16	5.52%
Germany	14	4.83%
India	12	4.14%
United Arab Emirates	8	2.76%
Japan	7	2.41%
Nigeria	7	2.41%
Turkey	7	2.41%
Indonesia	6	2.07%
Netherlands	6	2.07%
Pakistan	6	2.07%
Switzerland	6	2.07%

Authorship: To identify the most prolific authors in the context of this study, Table 10 provides a list of the most productive authors in a particular field based on the latest research available. The table lists the authors' names, the number of documents they have produced, and their respective percentages of contribution to the field. Among the most productive authors, Ahmed, A., Atif, M., Guo, C., Kamarudin, K.A., Li, G., and Yang, Y. each have three publications, accounting for 1.03% of the total publications each. Several other authors have produced two publications and have contributed significantly to the field. These authors include Amran, A., Blain, S., Cai, X., Cicchiello, A.F., Elgharbawy, A., Gallego-Álvarez, I., Gherghina, C., Hedding, D.W., Hossain, M., Hu, Y., Issa, A., Janis, J.P., Javeed, S.A., and Jones, M.R., each accounting for 0.69% of the total publications. It is worth noting that this list is not exhaustive, and there may be other productive authors in the field that were not included in this study. Nonetheless, the contributions of these authors to the field are significant, and their work has likely impacted future research in the field. The table provides a helpful summary of the authors who have made the most substantial contributions to the field, and it can be used as a reference for future researchers looking to build on this body of work.

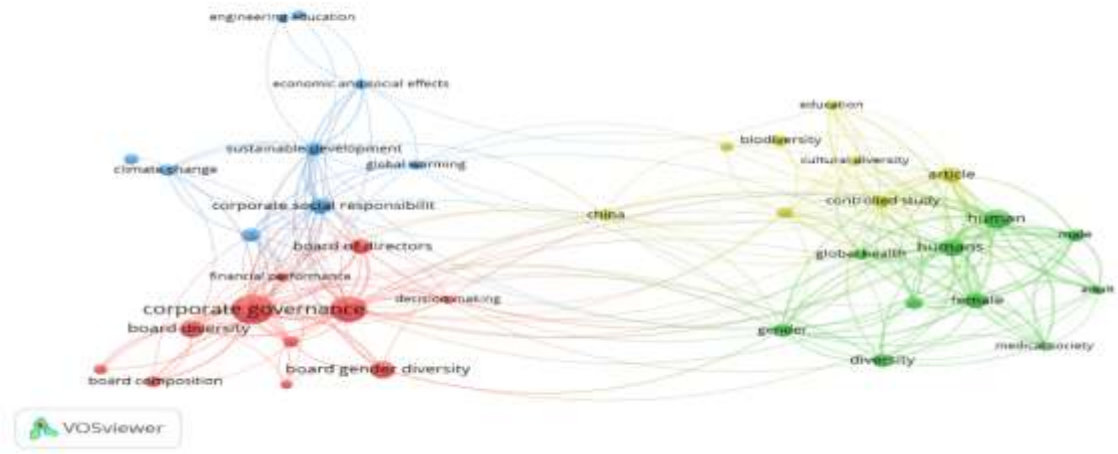
Table 10: Most Productive Authors

Author's Name	No. of Documents	Percentage (%)
Ahmed, A.	3	1.03%
Atif, M.	3	1.03%
Guo, C.	3	1.03%
Kamarudin, K.A.	3	1.03%
Li, G.	3	1.03%
Yang, Y.	3	1.03%
Amran, A.	2	0.69%
Blain, S.	2	0.69%
Cai, X.	2	0.69%
Cicchiello, A.F.	2	0.69%
Elgharbawy, A.	2	0.69%

Gallego-Álvarez, I.	2	0.69%
Gherghina, C.	2	0.69%
Hedding, D.W.	2	0.69%
Hossain, M.	2	0.69%
Hu, Y.	2	0.69%
Issa, A.	2	0.69%
Janis, J.P.	2	0.69%
Javeed, S.A.	2	0.69%
Jones, M.R.	2	0.69%

Text Analysis: Using VOSviewer software, the title and abstract of the gathered documents were analyzed using the full counting method. Figure 4 depicts the visualization of the noun occurrences based on the title and abstract. The size of the nodes indicates the strength of the occurrences, while the thickness of the lines between nodes indicates the strength of the relationship. Similar words are grouped to demonstrate their relationship. According to the analysis results, corporate governance, board diversity, board gender diversity, and board of directors are interconnected and frequently occur together. Four distinct colors were derived from the analysis, each representing one of the four essential groups identified by the analysis.

Figure 4: VOSviewer Visualization of a Term Co-Occurrence Network based on Title and Abstract Fields (Full Counting)



Most Influential Institutions: The most influential institutions in publishing board diversity articles are listed in Table 11. Table 11 presents the most influential institutions with a minimum of three publications. The CNRS Centre National de la Recherche Scientifique tops the list with eight publications, followed by Universiti Sains Malaysia, Universiti Teknologi MARA, University of Otago, Universidad de Salamanca, The University of Sydney, Universiti Malaya, Dalian Maritime University, Universidad Nacional Autónoma de México, Griffith University, INRAE, and Griffith Business School, each with four publications. Moreover, Sorbonne Université, Universiti Utara Malaysia, The University of Auckland, Victoria University, the University of Reading, and the University of Florida are tied for third place with three publications, each representing 1.03% of the total publications.

Table 11: Most Influential Institutions with a Minimum of Three Publications

Institution	Total Publications	Percentage (%)
CNRS Centre National de la Recherche Scientifique	8	2.76%
Universiti Sains Malaysia	4	1.38%
Universiti Teknologi MARA	4	1.38%
University of Otago	4	1.38%
Universidad de Salamanca	4	1.38%
The University of Sydney	4	1.38%
Universiti Malaya	4	1.38%
Dalian Maritime University	4	1.38%
Universidad Nacional Autónoma de México	4	1.38%
Griffith University	4	1.38%
INRAE	4	1.38%
Griffith Business School	4	1.38%
Sorbonne Université	3	1.03%
Universiti Utara Malaysia	3	1.03%
The University of Auckland	3	1.03%
Victoria University	3	1.03%
University of Reading	3	1.03%
University of Florida	3	1.03%

Citation Analysis: Table 12 summarises the citation metrics data from 2013 to 2022 generated by Harzing's Publish and Perish software. Harzing's Publish or Perish software was used to determine the citation metric for the Scopus database retrieval. The brief description includes the number of citations along with their citations per year, per paper, and author. Board diversity publications comprise 290 papers with 3,417 citations, averaging 342 citations per year. Each paper is cited 11.78 times, and the total h-index and g-index for all the publications are 31 and 50.

Table 12: Citations Metrics

Metrics	Data
Papers	290
Citations	3,417
Years	10
Cites_Year	341.7
Cites_Paper	11.78
Cites_Author	1333.84
Papers_Author	129.42
Authors_Paper	3.46
h_index	31
g_index	50

5. Conclusion and Recommendations

This study offered a bibliometric analysis of board diversity in the current research agenda. It was determined by how many Scopus-indexed articles were published between 2013 and 2022. The bibliometric indicators and analytical analysis based on the tools and techniques used in this study highlight the contribution of data mining and bibliometric techniques to improve the process of selecting the literature, as the study identified the trend and productivity of research on board diversity using bibliometric analysis (documents and source types, year of publications, languages, subject area and most active source titles, all keywords and title and abstracts, and the geographical distribution of publications from 2013–2022). In 2022, however, this subject

attracted considerable scholarly interest. Most articles appeared in academic journals, and English is the preferred language for research.

The United States reported the highest number of contributing authors for its publications, followed by the United Kingdom, Australia, China, and Spain. Business, management, and accounting were the most important fields that produced the sources. However, the topic also appears in publications covering other disciplines, including arts and humanities, earth and planetary sciences, physics and astronomy, mathematics, energy, and multidisciplinary. Despite making a few contributions to the field, this study has some limitations. This study utilized specific queries and keywords to locate the initial list of scholarly works published and indexed by Scopus, a common practice in previous bibliometric research. Although Scopus has been recognized as one of the most comprehensive online databases indexing all scholarly works, it does not include all accessible sources. Therefore, some exclusions are highly anticipated from this study. In addition, no search query is perfect enough to capture all scholarly works in this field. Indeed, results are anticipated to be inconsistent. Second, board diversity is a relatively new concept recently gaining popularity. There is a chance that other types of research conducted in the past have focused on board diversity without employing these keywords. Thirdly, this research analyzed the publications with stringent restrictions to avoid obtaining irrelevant search results. In the future, this work could be expanded to yield more precise results when searching for articles.

The proposed bibliometric study on board diversity research's evolution can contribute to theoretical and managerial aspects. The study's theoretical contribution lies in providing a comprehensive overview of the existing literature on board diversity, including research trends, citation patterns, and content analysis. This can help identify research gaps, emerging themes, and potential areas for future investigation, thereby advancing the theoretical understanding of board diversity. On the managerial side, the study's findings can have practical implications for managers and practitioners promoting board diversity in organizations. For example, by identifying key sources of influential research through citation analysis, managers can stay updated with the latest developments in the field and make informed decisions on resource allocation, collaboration opportunities, and strategic initiatives.

Furthermore, this bibliometric study has implications for regulatory bodies and policymakers in developing board structures. Regulators should be aware of the recent policy of worldwide on-board diversity, which encourages corporate firms to increase board diversity on corporate boards. This finding suggests that policymakers should be more concerned with issues surrounding board diversity and other related issues that could increase good corporate governance. This bibliometric study highlights the importance of board diversity literature and unveils patterns in theory, data, methods, and content. It can serve as a means of improving corporate governance for regulatory bodies and policymakers. This study offers valuable insights for companies and policymakers to develop a more refined governance structure that accommodates board demographic diversity attributes. Regulators should devise policies to encourage board diversity. In addition, policymakers should develop regulations and promote diversity of directors as one of the factors for improving governance mechanisms, which will ultimately improve firms' productivity.

By analyzing publications across various disciplines, bibliometric analysis can highlight interdisciplinary approaches to studying board diversity. Policymakers can encourage collaboration between different fields, fostering a holistic understanding of the topic and promoting comprehensive policy development. Bibliometric analysis can identify influential authors, institutions, and journals in board diversity research. Policymakers can leverage this information to facilitate knowledge transfer and collaboration between researchers, policymakers, and practitioners. Encouraging collaboration can lead to the development of more informed and impactful policies.

Bibliometric analysis can facilitate international comparisons of research output and trends related to board diversity. Policymakers can use this information to benchmark their country's research activities against those of other nations, identifying best practices and areas for improvement in their policies and initiatives. Bibliometric analysis can be used to monitor research progress on board diversity over time. Policymakers can track the growth of research output, identify emerging themes, and assess the impact of policy interventions. This monitoring can inform adaptive policymaking, ensuring policies remain relevant and effective in addressing current challenges.

By highlighting the existing research landscape, bibliometric analysis can help policymakers identify areas where additional research funding is needed. Allocating resources to under-researched areas can stimulate new studies, leading to a more comprehensive understanding of board diversity issues and potential solutions. Policymakers can leverage the insights from bibliometric analyses to develop well-informed and effective policies promoting board diversity and inclusion.

For future research, it has been suggested to expand this work to include other databases and bibliometric analyses of board diversity in developed and developing countries. Concerning this study's implications, the key findings are significant for policymakers and academics because they are aligned with a managerial impact for managers to promote board diversity for effective corporate governance practice.

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Emerging Trends in Sustainable Entrepreneurial Behaviour: Bibliometric Data Insights

*Nurul Hayani Abd Rahman, Zuraidah Mohamed Isa, Azyyati Anuar
Faculty of Business and Management, Universiti Teknologi Mara, Cawangan Kedah, Malaysia
*nurulhayani@uitm.edu.my, zuraidah588@uitm.edu.my, azyyati@uitm.edu.my

Abstract: The present study explores the current trends in sustainable entrepreneurial behavior to contribute fundamental knowledge for future academic research in the dynamic field of sustainable entrepreneurship. This study employs a bibliometric analysis using the Scopus database to identify significant changes and emerging topics in academic discourse about the selected keywords. By employing a systematic approach, one can attain a comprehensive understanding of the subject matter and establish a solid foundation for subsequent research. The analysis comprises a total of 666 articles obtained from Scopus. This study utilizes methodological tools like Microsoft Excel, Harzing's Publish or Perish program, and VOS viewer. These tools were used to quantify and evaluate citation frequencies. This method enables the assessment of the academic output and influence exerted by document type, evolution of published studies, subject area, and prominent keywords. Nevertheless, there are several constraints associated with this study, including the omission of articles published after 2022 and a specific emphasis on English-language publications from 1991 to 2022. Notwithstanding these limitations, there has been a substantial and continuous academic emphasis on the study of sustainable entrepreneurial behavior. Future research should investigate sustainable behavior within the context of social entrepreneurship. The government and policymakers have the ability to significantly contribute to the creation of an ecosystem that promotes sustainable entrepreneurship and sustainable development.

Keywords: *Sustainability, entrepreneurial behavior, bibliometric analysis, VOS viewer.*

1. Introduction

The Sustainable Development Goals (SDGs) play a paramount role in shaping global economic development in the 21st century. The acknowledgment of the SDGs as a central aspect of economic development underscores a paradigmatic shift towards a more comprehensive, environmentally aware, and socially accountable approach to economic growth. In the face of urgent global concerns like climate change, resource depletion, and social inequality, the need for entrepreneurship to address these challenges becomes crucial. The transformative agenda now places great importance on sustainable entrepreneurial behavior, which involves a strong commitment to environmental and social responsibility, ethical practices, and resource-efficient operations. The increasing awareness of social and environmental sustainability has precipitated the emergence of sustainable entrepreneurship as a central topic of research. The increased focus on societal and ecological concerns led to a significant interest in academic research on how entrepreneurial activities might align with sustainability imperatives. This discipline aims to elucidate how entrepreneurial endeavors can be harmonized with sustainability principles, encompassing the judicious utilization of resources, ethical business practices, and a conscientious assessment of social and environmental impacts. Conventional business models, which prioritize profit, encounter challenges in reconciling economic objectives with environmental and social responsibility.

Therefore, it is imperative to cultivate and encourage sustainable entrepreneurial behavior that aligns with the principles of sustainable development. This demonstrates an awareness of the interdependence between economic progress and the broader objectives of environmental stewardship and social equity, emphasizing the role of entrepreneurs in promoting sustainable and responsible global economic development. Entrepreneurs can utilize the combined knowledge and viewpoints of suppliers, consumers, and local communities to discover significant prospects and collaboratively design solutions that align with the multifaceted principles of sustainable development (Yang et al., 2022). Disseminating awareness regarding the critical nexus between sustainable development and entrepreneurship is integral to inspiring and mobilizing individuals to participate in sustainable entrepreneurship. Understanding the interplay between sustainable development and entrepreneurship can serve as a catalyst for increased participation in sustainable business initiatives (Hoogendoorn et al., 2019). Thus, the impetus for this study arises from the conviction that sustainable entrepreneurial behavior is not merely an ethical choice but also a strategic imperative for

businesses in the 21st century. Entrepreneurs have the capacity to address environmental and social challenges creatively and flexibly, offering a distinct opportunity to confront these difficulties.

Understanding the landscape of sustainable entrepreneurial behavior research through bibliometric analysis is crucial for identifying key research themes, influential scholars, and potential avenues for future exploration. Bibliometric analysis, a quantitative approach that examines patterns in academic literature, is instrumental in identifying emerging trends, key contributors, and critical research gaps within a specific discipline (Li et al., 2022). It provides a systematic and unbiased method for tracking the trajectory of knowledge dissemination and the evolution of research themes. However, despite the burgeoning interest in the convergence of entrepreneurship and sustainability, there is still limited research in this specific domain. While extant literature has explored various facets of sustainable entrepreneurship, there is a notable gap in consolidating and synthesizing this knowledge to offer a comprehensive understanding of emerging trends. This study aims to address this gap by employing bibliometric analysis to distill insights from a broad array of scholarly publications, providing a holistic perspective on the evolution of sustainable entrepreneurial behavior research. The remainder of this article reviews the relevant literature on sustainable entrepreneurship and the methodology employed for the bibliometric analysis. Subsequently, the article proceeds to discuss the findings and insights derived from the analysis, the study's implications, and avenues for future research. The conclusion provides a concise overview of the main points and underscores the significance of understanding emerging trends in sustainable entrepreneurial behavior for both academia and practical applications.

2. Literature Review

Entrepreneurs exert considerable influence in steering businesses towards sustainability. Sustainable entrepreneurship is characterized by a proactive approach that involves creating novel sustainable enterprises and conscientiously transforming existing ones to make them more sustainable. This multifaceted engagement entails not only starting environmentally and socially conscious businesses but also continuously scrutinizing and refining existing ventures to better conform to sustainable principles. Entrepreneurs' collective endeavors have a crucial role in promoting a comprehensive and enduring commitment to sustainable business practices (Sreenivasan & Suresh, 2023). Entrepreneurs must manage interconnected aspects such as resource utilization, social equity, and ecological impact to establish a well-rounded commitment to sustainability. The sustainable entrepreneurship framework encapsulates the strategic decisions and operational pursuits undertaken by sustainable entrepreneurs. It serves as a conceptual structure that outlines the orchestrated efforts of these entrepreneurs to harmonies their business models with the imperatives of sustainability.

By doing so, entrepreneurs aspire not only to achieve business success but also to contribute meaningfully to the broader goals of sustainability, demonstrating a conscientious and forward-thinking approach to entrepreneurial endeavors. Furthermore, a study conducted by (Peng et al., 2021) revealed a positive correlation between environmental values and the inclination to participate in sustainable entrepreneurship. Factors like experience, attitude, societal norms, and self-efficacy have an impact on the relationship between environmental values and sustainable entrepreneurial intention. Furthermore, there is a positive correlation between environmental values and the inclination to establish a sustainable company among entrepreneurs who have limited expertise, as opposed to their counterparts with extensive experience. Entrepreneurs must possess an understanding of the complex nature of sustainable development and acknowledge the necessity of regularly evaluating sustainable development-related aspects (Manshor & Saad, 2023). Sustainable entrepreneurial behavior, a burgeoning field within entrepreneurship studies, is characterized by a dual commitment to economic prosperity and ecological and social responsibility.

Empirical investigations into sustainable entrepreneurial behavior encompass a spectrum of research methodologies. The academic discourse surrounding this phenomenon, which incorporates diverse theoretical underpinnings and methodological approaches, enhances the increasing comprehension of the intricate dynamics between sustainability and entrepreneurs' behavior. The Theory of Planned Behavior (TPB), formulated by Ajzen (1991) offers a conceptual framework for understanding and predicting human behavior, specifically within the realm of intentional acts. According to this theoretical framework, it is proposed that an individual's intention to partake in a particular behavior is a key factor in determining the probability of that behavior being manifested. The intention is shaped by three primary determinants: the individual's disposition

towards the behavior, subjective norms, and perceived behavioral control. A study by (Ndofirepi, 2023) revealed that the variable of attitude toward behavior had a statistically significant direct impact on sustainable entrepreneurial intention, which was mediated by attitude towards behavior. Subsequent analysis revealed that subjective norms are one of the three components of the Theory of Planned Behavior (TPB).

Do not have a substantial impact as an antecedent for sustainable entrepreneurial intention. External variables, such as education and family support, exerted a substantial influence on the development of favorable attitudes. Notably, there was no substantial correlation between education, social support, and perceived behavior control. The study by Truong et al., (2022) revealed that perceived behavior control is the primary factor influencing the intention to initiate sustainable entrepreneurship (SE), closely followed by persona attitude. According to Thelken & de Jong (2020) attitudes and perceived behavioral control have a substantial impact on individuals' aspirations to become sustainable entrepreneurs. Therefore, possessing a positive mindset towards sustainability and seeing a sense of agency over one's actions in that context are key factors that motivate the inclination to engage in sustainable entrepreneurship (Yasir et al., 2021) posited that attitudes, perceived behaviors, and social norms collectively affect aspirations to engage in sustainable entrepreneurship. Romero-Colmenares & Reyes-Rodríguez (2022) revealed in their study that a number of factors, such as individuals' perceptions of such ventures, perceived difficulty, and adherence to subjective norms, have an impact on how they feel about starting sustainable enterprises. Moreover, the aforementioned aspects are shown to be positively influenced by the presence of altruistic values inside individuals, education for sustainable entrepreneurship, and their belief in attaining desired objectives.

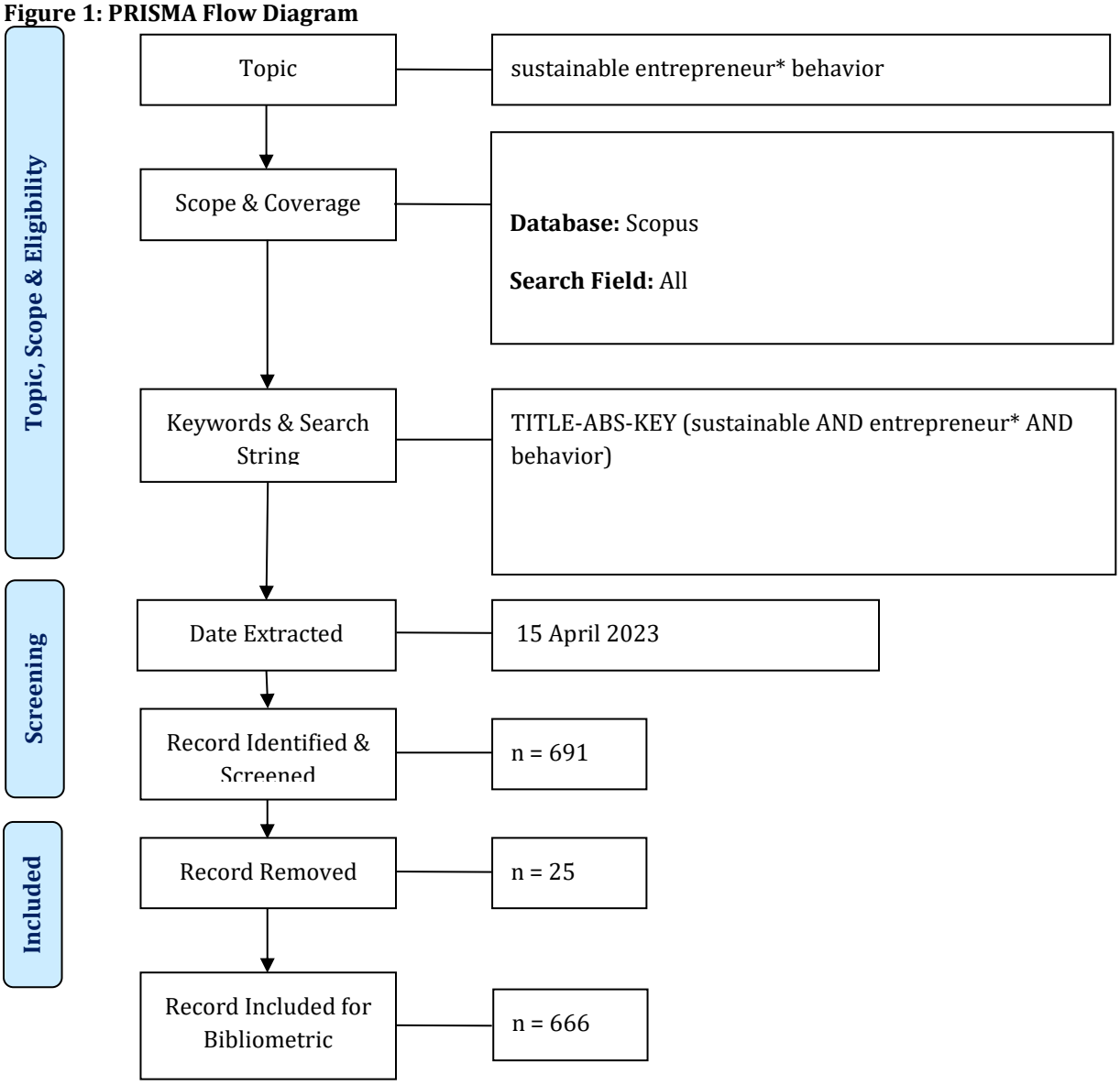
Vuorio et al., (2018) discovered that individuals' views on sustainability and their assessment of the importance of engaging in entrepreneurial activities influence the development of sustainable entrepreneurial intents. Altruism and extrinsic rewards are the driving forces behind the aforementioned attitudes, with extrinsic rewards notably exerting a contrasting influence on both drivers of sustainability-oriented entrepreneurial aspirations. The convergence of education and entrepreneurship has garnered considerable interest in recent years, particularly within the framework of sustainable development. Education is essential for providing entrepreneurs with the necessary knowledge, skills, and mindset to integrate sustainable practices into their ventures. A curriculum that emphasizes the principles of sustainable development, environmental stewardship, and social responsibility provides aspiring entrepreneurs with a holistic understanding of the interconnectedness between business and broader social and environmental contexts. Experiential learning and practical exposure are crucial in shaping sustainable entrepreneurs, going beyond the confines of conventional classroom settings. Internships, mentorship programs, and partnerships with sustainable businesses provide learners with practical experience and insights into the daily challenges of integrating sustainability into entrepreneurial ventures. These experiences cultivate a profound understanding of the pragmatic elements of sustainable business. Thus, it is imperative to adopt sustainable entrepreneurial behavior to attain a sustainable economy and effectively address environmental and social concerns.

Entrepreneurs must prioritize the integration of sustainability and social responsibility into their business practices to ensure long-lasting benefits for all stakeholders. Yang et al. (2022) discovered that the institutional environment substantial and positive influence on sustainable entrepreneurial behavior. Ultimately, the combination of a dedication to economic growth and a sense of accountability towards the environment and society is propelling the advancement of sustainable entrepreneurship as a significant influence in the modern business landscape. As entrepreneurs engage in this multifaceted journey, they navigate intricate terrain, seeking to harmonies ecological, social, and economic dimensions in decision-making processes. It is evident that various factors, including attitudes, perceived behavior control, social norms, and environmental values, play significant roles in shaping sustainable entrepreneurial intentions. Empirical research continues to illuminate the interconnectedness of sustainable entrepreneurship and the broader context of sustainability, underscoring the need for ongoing exploration in this dynamic field. Entrepreneurs must prioritize sustainability and responsibility in their business practices to create long-lasting value for all stakeholders, guided by an understanding of the intricate dynamics that motivate sustainable entrepreneurial behavior. Therefore, it is imperative to utilize bibliometric analysis to examine the dynamic field of sustainable entrepreneurial behavior. This approach is crucial for obtaining a thorough understanding of developing patterns, influential researchers, and promising avenues for further investigation in this critical domain.

3. Methods

This study employed data from the SCOPUS database. The selection of this database was based on its reputation as a comprehensive and esteemed repository of scholarly articles and research publications, encompassing a wide spectrum of academic disciplines. The meticulous curation and indexing processes ensure that it is a reliable and trustworthy source for academic research.

Figure 1: PRISMA Flow Diagram



Source: (Zakaria et al., 2021).

The specific date of 15 April 2023 was chosen strategically to ensure a balanced and comprehensive representation of available academic literature as reported in Figure 1. By selecting a cut-off date, we aimed to provide an accurate snapshot of the scholarly landscape up to that point in time, while excluding articles from the ongoing year to mitigate potential bias. This methodology allowed us to work with a dataset that was well-vetted and had undergone extensive quality control. The search was conducted using relevant keywords including "sustainable entrepreneur* behavior." Limited to articles containing these terms in the title, abstract and keywords. The resulting search yielded 691 articles for bibliometric analysis. However, 2023 articles were excluded from this study resulting in 666 articles available for analysis. A total of 25 articles were

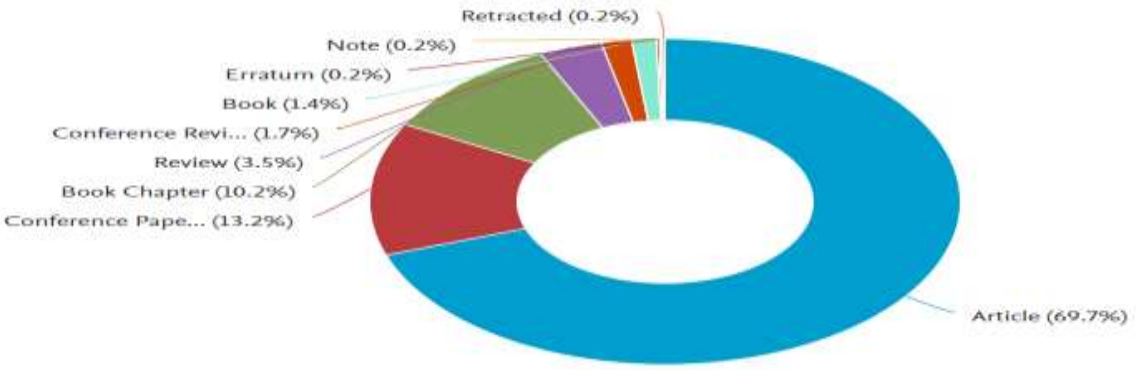
removed because of using other languages. To conduct the analysis, several tools were employed. First, Microsoft Excel was used to calculate the frequency of published materials and generate relevant charts and graphs. Second, Harzing's Publish or Perish software was used to calculate citation metrics and other relevant frequencies. Finally, a VOS viewer was used to construct and visualize bibliometric networks.

4. Results

The present study examines the bibliometric attributes of the literature on sustainable entrepreneurial behavior, drawing upon data obtained from the Scopus database. Specifically, researchers focus on analyzing several aspects, such as document and source types, publishing trends over time, language, source titles, country productivity, authorship, text content, and citation analysis. The findings were presented primarily in the form of frequency and percentage distributions. To map the co-occurrence of author keywords, researchers employ the VOS viewer software. Furthermore, the researcher's citation metrics and identifies the 20 publications with the highest number of citations from the Scopus database.

Document and Source Types: This study examines the documents obtained from the Scopus database, specifically analyzing the document type and source type. The document types covered in this analysis encompass journal articles, conference papers, book chapters, reviews, conference reviews, books, erratums, notes, and retracted. Figure 2 presents the distribution of document types.

Figure 2: Document Type Chart



Sources: Developed by the authors using Scopus Tools.

Table 1 displays the comprehensive distribution of publications across various document types within the analyzed domain. The data clearly indicates that the majority, specifically 464 publications, or 69.7%, are journal articles. Furthermore, conference papers represent a noteworthy portion, comprising publications, corresponding to 13.2%. Moreover, book chapters contribute to 10.2% of the total. The remaining categories collectively account for less than 10% of the overall publications, underscoring the relatively insignificant role of these alternative forms of scholarly dissemination in the specified field.

Table 1: Document Type

Document Type	Total Publications (TP)	Percentage (%)
Article	464	69.7
Conference Paper	88	13.2
Book Chapter	68	10.2
Review	23	3.5
Conference Review	11	1.7
Book	9	1.4
Erratum	1	0.2
Note	1	0.2
Retracted	1	0.2

Total	**666**	**100.0**

Sources: Developed by the authors using Scopus Tools.

This study has also defined categories of source types. Table 2 reveals a prominent trend, indicating that the predominant medium for disseminating articles is journals rather than conference proceedings and other sources. Journal articles account for the largest proportion, with 490 (73.6%) publications in Scopus index journals.

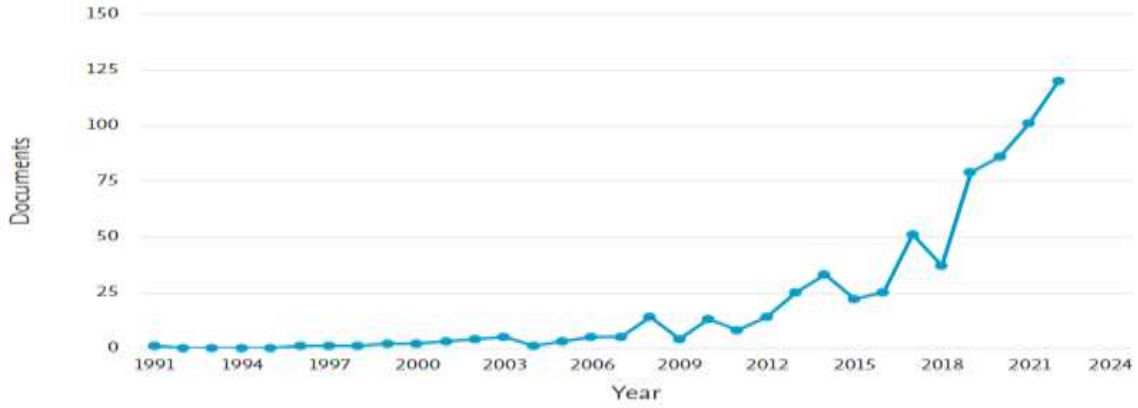
Table 2: Source Type

Source Type	Total Publications (TP)	Percentage (%)
Journal	490	73.6
Conference Proceeding	81	12.2
Book	51	7.7
Book Series	42	6.3
Trade Journal	2	0.3
Total	**666**	**100.00**

Sources: Developed by the authors using Scopus Tools.

Evolution of Published Studies: Over time, a clear trend emerges, signifying a noteworthy escalation in the corpus of publications germane to sustainable entrepreneurial behavior. An exhaustive examination of documents in the Scopus database has substantiated this chronological pattern, revealing a steady increase in the volume of publications starting in 1991, as visually depicted in Figure 3. This empirical evidence underscores the growing academic interest and attention given to the topic within the specified period.

Figure 3: Document by Year



Sources: Developed by the authors using Scopus Tools.

Table 3 provides a detailed summary of publication volume, percentages, and cumulative percentages of documents published on sustainable entrepreneurial behavior. Notably, the year 2022 stands out as the peak, recording the largest proportion of publications at 18.0%.

Table 3: Year of Publications

Year	Total Publications	Percentage (%)	Cumulative Percent (%)
2022	120	18.0	18.0
2021	101	15.2	33.2
2020	86	12.9	46.1
2019	79	11.9	58.0
2018	37	5.6	63.5
2017	51	7.7	71.2
2016	25	3.8	74.9
2015	22	3.3	78.2

2014	33	5.0	83.2
2013	25	3.8	86.9
2012	14	2.1	89.0
2011	8	1.2	90.2
2010	13	2.0	92.2
2009	4	0.6	92.8
2008	14	2.1	94.9
2007	5	0.8	95.6
2006	5	0.8	96.4
2005	3	0.5	96.8
2004	1	0.2	97.0
2003	5	0.8	97.7
2002	4	0.6	98.3
2001	3	0.5	98.8
2000	2	0.3	99.1
1999	2	0.3	99.4
1998	1	0.2	99.5
1997	1	0.2	99.7
1996	1	0.2	99.8
1991	1	0.2	100.0

Sources: Developed by the authors using Scopus Tools.

Languages of Documents: English is the predominant language for scholarly communication, with 648 publications, constituting 97.0% of the total. Concurrently, a minority of publications are distributed across other languages, including Spanish, Portuguese, German, French, Croatian, Japanese, Russian, and Ukrainian.

Table 4: Languages Used for Publications

Language	Total Publications	Percentage (%)
English	648	97.0%
Spanish	7	1.1%
Portuguese	4	0.6%
German	3	0.5%
French	2	0.3%
Croatian	1	0.2%
Japanese	1	0.2%
Russian	1	0.2%
Ukrainian	1	0.2%
Total	**668**	**100.0**

Sources: Developed by the authors using Scopus Tools.

Subject Areas: Table 5 reveals that scholars have mostly examined sustainable entrepreneurial behavior within subject areas of significant attention, with each field surpassing the 20% threshold. Subject areas that received significant attention in scientific research include business, management, and accounting (47.3%); social science (37.8%); environmental science (29.3%); economics, econometrics, and finance (21.3%); and energy (21.02%). This distribution underscores the interdisciplinary nature of research on sustainable entrepreneurial behavior, demonstrating its confluence with diverse academic domains.

Table 5: Subject Area

Subject Area	Total Publications	Percentage (%)
Business, Management and Accounting	315	47.3
Social Sciences	252	37.8
Environmental Science	195	29.3
Economics, Econometrics and Finance	142	21.3
Energy	140	21.0

Engineering	112	16.8
Computer Science	75	11.3
Decision Sciences	43	6.5
Agricultural and Biological Sciences	30	4.5
Medicine	30	4.5
Earth and Planetary Sciences	20	3.0
Psychology	20	3.0
Mathematics	16	2.4
Arts and Humanities	14	2.1
Biochemistry, Genetics and Molecular Biology	5	0.8
Materials Science	5	0.8
Chemical Engineering	4	0.6
Immunology and Microbiology	4	0.6
Physics and Astronomy	3	0.5
Health Professions	2	0.3
Nursing	2	0.3
Chemistry	1	0.2
Multidisciplinary	1	0.2
Neuroscience	1	0.2
Pharmacology, Toxicology and Pharmaceutics	1	0.2
Veterinary	1	0.2

Most Active Source Titles: Table 6 displays the source titles that have published the highest number of articles on sustainable entrepreneurial behavior, based on a minimum threshold of five publications per source title. The table indicates that Sustainability Switzerland has the highest number of publications, with 91 (13.7%). Subsequently, the Journal of Cleaner Production published 13 articles, and Frontiers in Psychology published 10 articles.

Table 6: Most Active Source Title

Source Title	Total Publications	Percentage (%)
Sustainability Switzerland	91	13.7%
Journal Of Cleaner Production	13	2.0%
Frontiers In Psychology	10	1.5%
International Journal of Entrepreneurial Behavior and Research	8	1.2%
E3s Web of Conferences	7	1.1%
Business Strategy and The Environment	6	1.0%
Developments In Marketing Science Proceedings of The Academy of Marketing Science	6	1.0%
Journal Of Business Venturing	6	1.0%
Proceedings Of the European Conference on Innovation and Entrepreneurship Ecie	6	1.0%
World Review of Entrepreneurship Management and Sustainable Development	6	1.0%
Emerald Emerging Markets Case Studies	5	0.8%
International Journal of Environmental Research and Public Health	5	0.8%
Journal Of Sustainable Tourism	5	0.8%
Management Of Environmental Quality an International Journal	5	0.8%

Sources: Developed by the authors using Scopus Tools.

Top Keywords: Table 7 presents the primary keywords, which are concepts that consistently appear and have significant prominence across a collection of academic publications. The prominence of a keyword often indicates the relevance and importance of the topic under investigation. The term “sustainable development” appears in 192 publications, representing almost 20% of the total. The terms “sustainability,”

"entrepreneurship," "entrepreneur," "innovation," "sustainable entrepreneurship" and "social entrepreneurship," have a combined occurrence rate of over 5%.

Table 7: Top Keywords

Author Keywords	Total Publications	Percentage (%)
Sustainable Development	192	28.8%
Sustainability	121	18.2%
Entrepreneurship	102	15.3%
Entrepreneur	96	14.4%
Innovation	67	10.1%
Sustainable Entrepreneurship	49	7.4%
Social Entrepreneurship	39	5.9%
Human	27	4.1%
Education	23	3.5%
Article	22	3.3%
Consumption Behavior	22	3.3%
Perception	22	3.3%
Students	22	3.3%
Economics	21	3.2%
Business Development	19	2.9%
Corporate Social Responsibility	19	2.9%
Humans	19	2.9%
Business	18	2.7%
Consumer Behavior	18	2.7%
Small And Medium-sized Enterprise	18	2.7%

Sources: Developed by the authors using Scopus Tools.

Figure 4: Word Cloud of the keywords



Sources: Developed by the authors using a word cloud generator.

A comprehensive analysis was performed on a collection of 666 publications from 1991 to 2022. These articles were selected based on the presence of author-assigned keywords in the Scopus database. The outcome of this thorough examination is presented in Figure 4, which displays a word cloud that visually represents the frequency and importance of specific terms in the analyzed dataset.

Geographical Distribution of Publications: China has established a notable presence, with a cumulative total of 75 publications. Following China, the United States, the United Kingdom, Germany, and India are substantial contributors, with each country contributing more than 5% of the total publications. Table 8 represents the global distribution of academic publications.

Table 8: Top 20 Countries Contributed to the Publications

Country	Total Publications	Percentage (%)
China	75	11.3%
United States	66	10.0%
United Kingdom	48	7.2%
Germany	46	6.9%
India	35	5.3%
Spain	32	4.8%
Italy	31	4.7%
Netherlands	31	4.7%
Romania	31	4.7%
Australia	27	4.1%
France	24	3.6%
Pakistan	22	3.3%
Canada	20	3.0%
Malaysia	20	3.0%
South Africa	18	2.7%
Poland	17	2.6%
Portugal	17	2.6%
Finland	14	2.1%
Indonesia	14	2.1%
Russian Federation	14	2.1%

Authorship: The identification of the most productive authors entails a quantitative assessment of the number of publications they have authored or co-authored within a specific dataset or timeframe. Analysis and compilation of the most prolific authors provide useful insights into the individuals who have significantly contributed to shaping and advancing the discourse within a particular research project on sustainable entrepreneurial behavior as shown in Table 9. Dimitrov, Dimitrova, and Nazir yielded a return exceeding 0.5%. Understanding the most prolific authors is advantageous for multiple reasons. It promotes the identification of prominent thinkers and experts in the field, enables the acknowledgment of influential contributors, and establishes a foundation for collaborative networking within the academic community. Moreover, it assists researchers, institutions, and funding agencies in making well-informed decisions regarding potential collaborators, mentors, or individuals to engage in research endeavors.

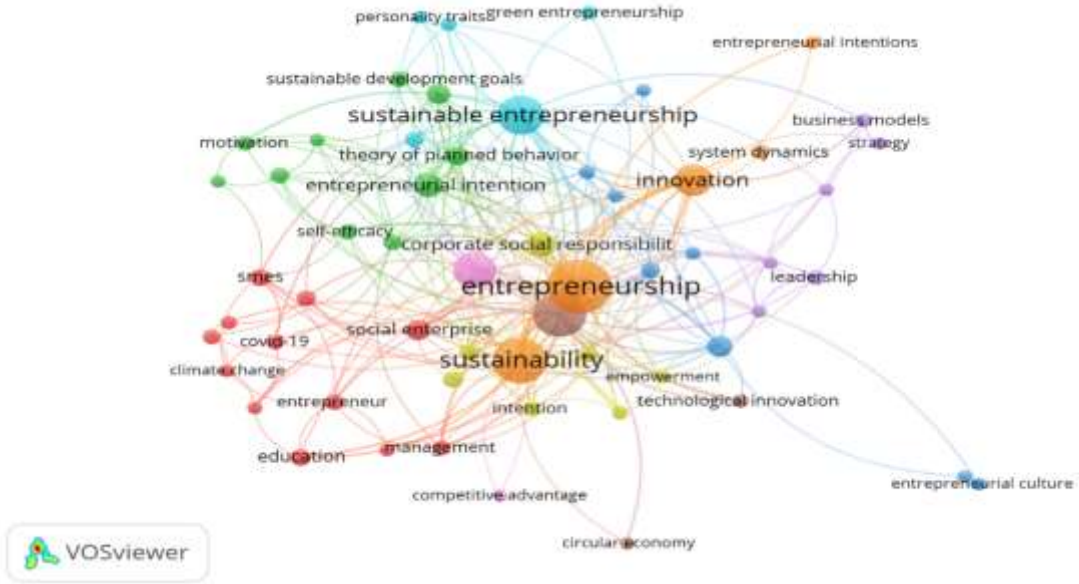
Table 9: Most Productive Authors

Author's Name	No. of Documents	Percentage (%)
Dimitrov, I.	4	0.6%
Dimitrova, A.	4	0.6%
Nazir, M.	4	0.6%
Dean, T.J.	3	0.5%
Dickel, P.	3	0.5%
Feder, E.S.	3	0.5%
Kratzer, J.	3	0.5%
Yasir, N.	3	0.5%
Agterbosch, S.	2	0.3%
Agu, A.G.	2	0.3%
Ahmad, K.	2	0.3%
Allen, L.K.	2	0.3%
Arshad, A.	2	0.3%
Ashraf, S.F.	2	0.3%
Atiku, S.O.	2	0.3%

Badulescu, D.	2	0.3%
Behl, A.	2	0.3%
Ben Amara, D.	2	0.3%
Brettel, M.	2	0.3%
Cantaragiu, R.	2	0.3%

Text Analysis: Aiming to comprehensively visualize and map sustainable entrepreneurial behavior, a corpus comprising 666 academic articles was collected and cataloged within the Scopus database. To perform a detailed analysis of this extensive dataset, researchers employed VOS viewer, a sophisticated analytical tool. The primary objective of this analytical exercise was to explore the co-occurrence network that exists within the authors' keywords assigned to these articles, as shown in Figure 5.

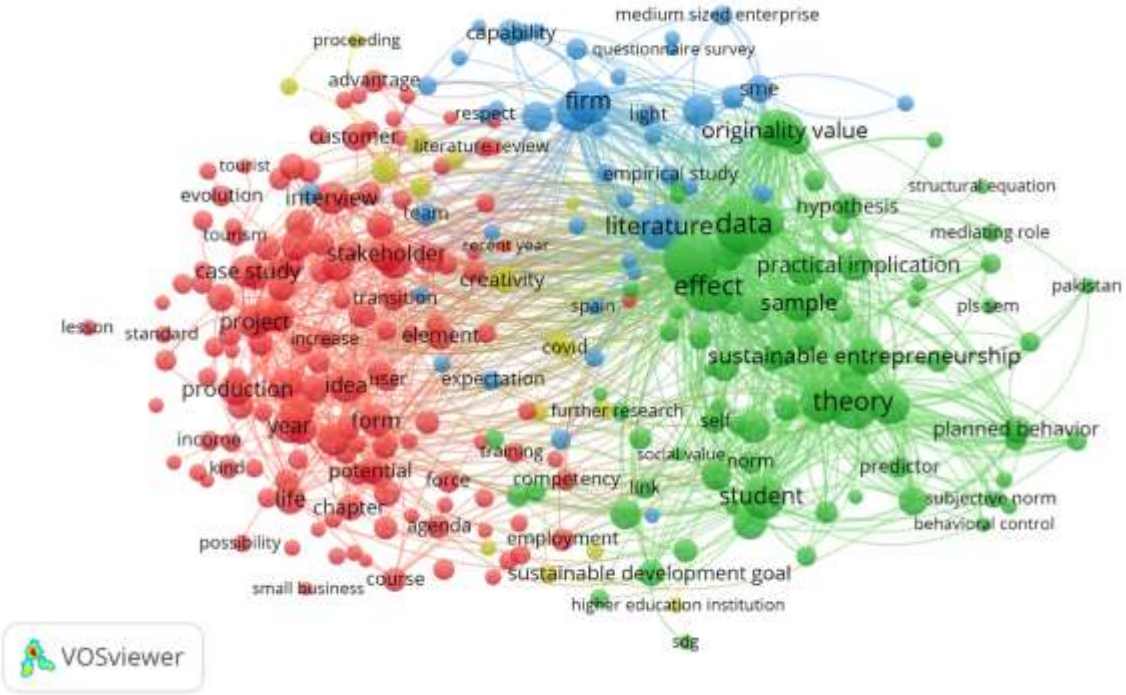
Figure 5: VOS Viewer Visualization of a Term Co-Occurrence Network Based on Author Keywords (Binary Counting)



Sources: Developed by the authors using VOS viewer.

The co-occurrence network is a visual representation that reveals relationships between title and abstract in the academic discourse on sustainable entrepreneurial behavior. It serves as a robust tool for identifying common themes and connections. Through the examination of patterns of title co-occurrence, researchers gain insights into the thematic clusters, focal points, and interdisciplinary intersections that characterize the scholarly landscape. By systematically analyzing patterns of title co-occurrence, scholars can establish the interconnections between diverse research inquiries within the realm of sustainable entrepreneurial behavior. Adopting this perspective facilitates the identification of significant concepts that captivate scholars and the delineation of novel ideas that establish connections across diverse academic disciplines.

Figure 8: VOS Viewer Visualization of a Term Co-Occurrence Network Based on Title and Abstract Fields (Binary Counting)



Sources: Developed by the authors using VOS viewer**.**

The co-occurrence network analysis of titles and abstracts, depicted in Figure 8, is a robust mechanism for uncovering the underlying structure and thematic diversity inherent in the scholarly discourse on sustainable entrepreneurial behavior. This analysis significantly enhances the depth and breadth of knowledge in this field.

Citation Analysis: Citation analysis is a methodological approach used in bibliometric analysis to examine and quantify citations in academic literature. The primary objective of this analysis is to understand the patterns of citation between academic publications, as indicated in Table 10. Over 32 years, a total of 666 papers have been identified. The citation intensity is quantified at an average rate of 367.88 citations per year, offering a dynamic perspective of the consistent scholarly influence over time.

Table 10: Citations Metrics

Metrics	Data
Publication years	1991-2022
Citation years	32 (1991-2023)
Papers	666
Citations	11772
Citations/year	367.88
Citations/paper	17.68
Citations/author	6005.31
Papers/author	302.45
h-index	45
g-index	95

Table 11: Highly Cited Articles

No.	Authors	Title	Year	Cites	Cites per Year
1	T.J. Dean, J.S. McMullen	Toward a theory of sustainable entrepreneurship: Reducing environmental degradation through entrepreneurial action	2007	806	50.4
2	J. Klewitz, E.G. Hansen	Sustainability-oriented innovation of SMEs: A systematic review	2014	683	75.9
3	N.M. Carter, W.B. Gartner, P.D. Reynolds	Exploring start-up event sequences	1996	578	21.4
4	D. Rodrik	Policy uncertainty and private investment in developing countries	1991	393	12.3
5	J.K. Hwee Nga, G. Shamuganathan	The Influence of personality traits and demographic factors on social entrepreneurship start up intentions	2010	376	28.9
6	R.M. Kanter	From spare change to real change. The social sector is a beta site for business innovation.	1999	355	14.8
7	R. Bohnsack, J. Pinkse, A. Kolk	Business models for sustainable technologies: Exploring business model evolution in the case of electric vehicles	2014	349	38.8
8	D.F. Pacheco, T.J. Dean, D.S. Payne	Escaping the green prison: Entrepreneurship and the creation of opportunities for sustainable development	2010	310	23.9
9	S. Wu, L. Wu	The impact of higher education on the entrepreneurial intentions of university students in China	2008	241	16.1
10	H. Simon	Hidden champions of the twenty-first century: Success strategies of unknown world market leaders	2009	217	15.5
11	A.L. Larson	Sustainable innovation through an entrepreneurship lens	2000	197	8.6
12	V. Griskevicius, S.M. CantÃº, M. Van Vugt	The evolutionary bases for sustainable behavior: Implications for marketing, policy, and social entrepreneurship	2012	185	16.8
13	E. Pomarici, R. Vecchio	Millennial generation attitudes to sustainable wine: An exploratory study on Italian consumers	2014	183	20.3
14	S.M. Danes, J. Lee, K. Stafford, R.K.Z. Heck	The effects of ethnicity, families and culture on entrepreneurial experience: An extension of sustainable family business theory	2008	177	11.8
15	M. Schindehutte, M.H. Morris, A. Kocak	Understanding market-driving behavior: The role of entrepreneurship	2008	162	10.8
16	R. Strausz	A theory of crowdfunding: A mechanism design approach with demand uncertainty and moral hazard	2017	147	24.5
17	A.M. Vuorio, K. Puumalainen, K. Fellnhofer	Drivers of entrepreneurial intentions in sustainable entrepreneurship	2018	136	27.2
18	R. Isaak	The making of the ecopreneur	2002	136	6.5
19	M. Fretschner, S. Weber	Measuring and understanding the effects of entrepreneurial awareness education	2013	133	13.3
20	L.H. Chung, P.T. Gibbons	Corporate Entrepreneurship: The roles of ideology and social capital	1997	130	5.0

Highly cited articles in bibliometric analysis are scholarly works that have garnered a significant number of citations from other academic publications. Identifying highly cited articles is crucial for assessing the impact, influence, and visibility of research in a particular field. Table 11 displays the maximum number of citations per year, which is 50.38, for the article titled "Towards a Theory of Sustainable Entrepreneurship: Reducing Environmental Degradation Through Entrepreneurial Action" by Dean and McMullen in 2007.

5. Conclusion

The Sustainable Development Goals (SDGs) have emerged as the dominant framework for global economic development in the 21st century. They represent a transition towards a more inclusive, environmentally aware, and socially responsible approach. Entrepreneurship is vital to addressing pressing issues like climate change, resource depletion, and social inequity. Sustainable entrepreneurial behavior is becoming a pivotal component of this transformative agenda. The study explores the increasing awareness of social and environmental sustainability, emphasizing the link between entrepreneurial activity and the need for sustainability. Given the complications faced by conventional profit-centric models in balancing economic objectives with environmental and social responsibilities, it is crucial to cultivate sustainable entrepreneurial behavior. This insight demonstrates the interdependence between economic progress and the wider objectives of environmental conservation and societal equity. Theoretical implications emphasize the evolving landscape of sustainable entrepreneurial behavior research, highlighting the need for an ongoing investigation in this dynamic field. The study underscores strategic imperatives for enterprises to prioritize sustainability as an objective. Entrepreneurs are urged to cooperate in creating solutions aligned with the multifaceted principles of sustainable development.

The practical implications highlight the importance of raising awareness about the critical nexus between sustainable development and entrepreneurship. The study suggests that understanding this connection can serve as a catalyst for increased participation in sustainable business initiatives, fostering a comprehensive commitment to sustainable business practices. Despite having gained valuable insights, the study acknowledges certain limitations. The focus on English-language literature and reliance on a specific database might restrict the generalisability of findings. Moreover, bibliometric analysis on the specific topic of sustainable entrepreneurship remains relatively uncharted, indicating the necessity for further extensive investigation. Thus, future research should delve into non-English literature and consistently observe emerging trends and sustainable cultures to advance knowledge of sustainable entrepreneurial behavior. The study posits sustainable entrepreneurship as a catalyst for transformation, necessitating continuous dedication to environmentally and socially responsible business strategies toward achieving sustainable and responsible global economic development. Social entrepreneurship has emerged as a potent catalyst for attaining beneficial transformation, specifically targeting the resolution of social and environmental concerns. The term "social entrepreneurship" has recently gained significant prominence in academic literature, ranking among the top keywords in numerous studies.

Although social entrepreneurship shows great potential, it is not devoid of obstacles. Social entrepreneurs can encounter difficulties in securing funding, assessing social impacts, and navigating regulatory frameworks. Addressing these issues requires a collaborative effort from governments, non-profit organizations, and the private sector to establish a conducive environment for social ventures. Governments and policymakers can play a pivotal role in fostering an environment that supports social entrepreneurship for sustainable development. Implementing policies that provide financial incentives, streamlined regulations, and social impact measurement can encourage the growth of social enterprises. Furthermore, integrating social entrepreneurship into educational curricula can cultivate a new generation of socially conscious entrepreneurs. Furthermore, education not only imparts knowledge but also plays a crucial role in shaping the mindset of prospective entrepreneurs. Instilling a sustainability mindset involves cultivating values such as responsibility, empathy, and a long-term orientation. By emphasizing the triple bottom line—people, planet, and profit—educational programs can nurture entrepreneurs who are not only business-savvy but also socially and environmentally conscious. Thus, by shaping a new generation of entrepreneurs who are well-versed in sustainable business practices, educational institutions contribute to the broader objective of creating a more resilient, responsible, and sustainable global economy.

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Factors Influencing Job Performance among Academic Staff in Malaysian Public University

Che Mohd Syaharuddin Che Cob[1*], Ummi Kalsom Zakaria[2], Mohd Hafeez Al-Amin Abdul Wahab[3], Julaina Baistaman[1], Siti Nur Zahirah Omar[3], Nor Baizura Osman[4]
[1]Faculty of Business and Management, Universiti Teknologi MARA Cawangan Kelantan, Kampus Kota Bharu, Malaysia
[2]Faculty of Business and Management, Universiti Kebangsaan Malaysia, Selangor, Malaysia
[3]Faculty of Business and Management, Universiti Teknologi MARA Cawangan Kelantan, Kampus Machang, Malaysia
[4]Maybank Berhad, MM55-59 Jalan Persiaran Dara Medan Mewah, 26700 Muadzam Shah, Pahang, Malaysia
*syaha793@uitm.edu.my, ummizakaria88@gmail.com, mohdhafeez@uitm.edu.my, julaina@uitm.edu.my, sitinurzahirah@uitm.edu.my, cili2_4padi@yahoo.com

Abstract: Extensive research has been conducted on the factors that determine job performance. The current study was required by a lack of research relating to the factors of job performance among academic staff in Malaysian public universities. The purpose of this study is to investigate the effects of personality traits, motivation, leadership style, and learner autonomy on job performance. Data was collected from the academic staff of a public university in Malaysia. The probability technique, which is simple random sampling was used in this study. The study is guided by an adapted ten-point Likert Interval Scale structured questionnaire as the main instrument used in collecting the data. Furthermore, the analysis of data was undertaken by using Confirmatory Factor Analysis (CFA) procedures. Structural equation modeling (SEM), a multivariate approach, was used to empirically evaluate and estimate the hypothesized link between constructs using Analysis of Moment Structure (AMOS) software version 20.0. The findings indicate that job performance is significantly and positively related to personality traits, motivation, leadership style, and learner autonomy. Motivation is a significant predictor of job performance when compared to other variables. The study proves that the combination of personality traits, motivation, learner autonomy, and leadership style on job performance may contribute to the optimal service delivery to stakeholders within Malaysia's educational system. Therefore, the implications of the findings, potential limitations, and directions for future research are also discussed.

Keywords: *Job performance, personality traits, motivation, learner autonomy, and leadership style*.

1. Introduction and Background

The employee is the organization's most valuable asset. Employee job performance has a significant impact on whether a business succeeds or fails (Al-Jedaia & Mehrez, 2020). This suggests that employees' job performance plays a part in the organization's success. Furthermore, according to Song et al. (2019), job performance is crucial for the advancement of employee development and human resource capabilities. Thus, regardless of industry, job performance was acknowledged to be related to an organization's success (Angeles et al., 2022). As such, this study aims to determine the effect of personality characteristics, motivation, learner autonomy, and leadership style on job performance. Additionally, by identifying the most significant aspects of job performance, the empirical data obtained from this research should be beneficial as a basis for management decision-making to assure the organization's continuity. Despite the importance of the issues, a lack of research has investigated the combined effect of these factors on job performance. The existing research has mainly focused on the personality traits, motivation, and leadership style on job performance, without considering their interrelationships with learner autonomy. Therefore, there is a need for a comprehensive study that can provide insights into learner autonomy as a new variable. Such a study can help organizations design effective human resource management practices that can enhance job performance among academic staff in Malaysian public universities.

2. Literature Review

Job Performance: Job performance has been defined as a person's ability to perform tasks accurately, completely, cost-effectively, and efficiently, with the primary goal of achieving organizational objectives (Grahandika and Wijayati, 2021; Lai et al., 2020). Job performance can be categorized into task performance, adaptive performance, and contextual performance. Task performance refers to the efficiency of job-related

tasks (Bhat & Beri, 2016). Adaptive performance refers to an employee's ability to adapt to changes in the workplace, creative problem-solving, learning new tasks, and interpersonal, cultural, and physical flexibility (Fogaca et al. 2018). Then, contextual performance refers to an employee's commitment to their social, psychological, and organizational context, surrounding efforts, initiative, enthusiasm, resourcefulness, motivation, creativity, cooperation, communication, interpersonal relationships and organizational commitment (Ramawickrama et al., 2017). Job performance is an important indicator of how well employees perform their work, whether it is good or not. Job performance refers to the effort employees make on their jobs, ensuring dependable performance and responsibility for tasks (Hasanah & Kurniawan, 2017). It includes activities that contribute to a company's effectiveness, even if they are outside their specific task. Kaveri & Prabakaran (2013) define job performance as the contribution employees make to enhance company productivity. Job performance measures individual worker effectiveness and influences personnel decisions like merit-based payment, promotion, and retention (Motowildo 2003; Mohamad & Jais, 2016). It's crucial for workers and organizational success, ensuring the best performance among employees. Besides, job performance refers to a person's high effectiveness and efficiency in achieving their goals and objectives (Hirlak et al., 2018; Khoshnaw and Alavi, 2020). Employee performance is determined by the amount and standard of work an employee accomplishes while performing their assigned tasks (Darma & Supriyanto, 2017). Song et al. (2019) highlighted the significance of job performance in developing human resource skills and as an indicator of an organization's success and achievement. Measurement of performance is central, as important organizational decisions are based on individual performance (Sadick & Kamardeen, 2020).

Personality Traits and Job Performance: The Big Five Personality Dimensions, colloquially referred to as the five-factor model, are extraversion, agreeableness, conscientiousness, openness to experience, and neuroticism. Job performance can also be classified according to job results, job conduct and personality qualities (Cook, 2005; Detrick & Chibnall, 2006; Zulelawati & Yusri, 2015). The current study examines employees to determine the predictive validity of the big five personality traits on their job performance and to establish a link between personality traits and job performance (Seddigh et al., 2016; Alsuwailem & Elnaga, 2016; Tuteja & Sharma, 2018; Maryam & Muhammad, 2020; Beng and Muthuveloo, 2020; Gridwichai et al., 2020; Delima, 2019; Ajayi et al., 2017). The predictive association revealed that openness to experience, agreeableness, and extraversion were significant correlations and predictors of job success, accounting for 35.2% of the variance in participants' management performance. Neuroticism was discovered to be a significant negative relationship. On the other hand, conscientiousness had a negligible effect on the model. Based on these arguments, this study asserts that personality characteristics have a strongly favorable effect on job success. Therefore, this study aims to find out the personality traits that affect their job performance. Hence, it is hypothesized as:
H1: *Personality trait has a positive significant influence on job performance.*

Motivation and Job Performance: Motivation is one of the most important factors in any organization, whether private or public sector, in achieving excellent job performance. Motivation appears in a person because they realize something that needs to be done and will strive towards a better way until they succeed (Nazrin, 2020). Jalagat (2016) uses theoretical models and existing literature to analyze the relationship between motivation and job performance. Although research has been undertaken on motivation and job performance, the extent to which they are related continues to be debated. The findings indicated that motivation and job performance are inextricably linked. When job performance is compared to team performance, it is discovered that higher performance is associated with higher performance, albeit this is not always the case. Collaboration is critical to achieving desired outcomes, which means that people should be encouraged to collaborate to effectively accomplish goals and achieve success. Moon et al. (2019) conducted another investigation to gain a better grasp of the underlying process through which work motivation affects service personnel's job performance. The purpose of this study is to determine how job motivation affects job performance. The findings of this study indicate that motivation is favorably associated with job performance (Triswanto et al., 2021; Nordin and Hassan, 2019; Miao et al.,2020; Omale et al., 2022; Fawehinmi et al., 2020; Trinh et al., 2021; Adomako et al., 2016; Basinska et al., 2019). Therefore, the motivation factor is one of the important aspects of improving job performance and achieving organizational goals among UiTM academic staff. Thus, the following hypothesized is proposed:
H2: *Motivation has a positive significant influence on job performance.*

Learner Autonomy and Job Performance: The concept of learner autonomy has been around for quite some time and is often associated with the ability of learners to take charge of their own learning experiences. However, from a human resource management perspective, learner autonomy encompasses several other learning concepts, such as employee development, self-development, self-directed learning, workplace, and informal learning. Researchers have suggested a potential relationship between learner autonomy and job performance in the workplace. Learner autonomy is believed to promote a higher degree of employee engagement with training materials, leading to better productivity and knowledge retention (Wihler et al., 2017; Ustunlouglu, 2009; Lengkanawati,2017, Tutu and Constantin, 2012, Mogos et al., 2021, Keskin, 2020). Baron and Kenny created the model (1986). It is also thought to improve learning strategies and act as a driver of learner engagement. By offering learners an autonomous learning approach, learning and development professionals can equip them to perform better professionally and in their professional lives. The study's findings indicate a positive association between the aforementioned topics. Thus, it is hypothesized as:
H3: *Learner autonomy has a positive significant influence on job performance.*

Leadership Style and Job Performance: In today's competitive business world, leadership styles have garnered considerable attention. It has grown in popularity as a means of standardizing human resource management practices (Islam, Rahman, & Siddiqui, 2020; Hasmin, 2017; Clark & Gruber, 2017). A business may be able to realize its vision if it has a meaningful and established method for doing leadership activities. Additionally, research has established that leadership style is a significant predictor of employee work effectiveness. The research's primary objective is to unearth participatory, supporting, and authoritarian leadership practices that influence employee job performance and to investigate the relationship between leadership styles and employee job performance. The research findings indicate that there is a statistically significant positive correlation between leadership styles and employee job performance and that leadership styles have a significant impact on employee performance except for the autocratic style, which policymakers and practitioners must address to ensure employee job performance, particularly in the mobile telecommunications industry. Booth et al. (2019) explained that the leadership style applied in an organization determines whether the organization produces a lot of innovation. Innovation is determined by the leader to motivate group members to the extent that each member can contribute to the organization. Leaders at the upper level until the operational part of the organizational structure determine the potential of the organization to produce innovation. It is not only focused on the leadership style of the administration. However, Rosul Asmawi (2017) argues that an effective leadership style can affect the characteristics and performance of subordinates in an organization. Leadership style for academic staff is very important in the development of an institution at a higher level in Malaysia (Masi & Cooke, 2000; Miller, 2011; Paracha, 2012; Odumeru & Ifeanyi, 2013; Van & Sitkin, 2013; Razak et al., 2014; Moo Jun & Rashad, 2015; Yahaya & Ebrahim, 2016; Sol et al., 2016; Mustaqim, 2016; Anderson & Sun, 2017; Fariq et al., 2017; Velikova, 2017; Behery et al., 2018; Mohd Azuan et al., 2019; Zakaria et al., Rahman et al., 2021; 2021; Voster, 2019; Amirah 2021; Sastra et al., 2021; Mahmood et al., 2021; Rosnizah et al., 2022). It will affect the emotions, performance, behavior, and even actions of lecturers in their daily tasks. Therefore, this hypothesized is proposed:
H4: *Leadership style has a positive significant influence on job performance.*

3. Research Methodology

The unit of analysis of this study is individuals. Data was collected from the academic staff of a public university in Malaysia. The probability technique, which is simple random sampling was used in this study because it ensures that all members of the population have an equal chance of being chosen as a representative sample, the results are unbiased, and the hypothesis developed can be tested (Sekaran, 2003). The study population consisted of 8,275 academic staff of a public university in Malaysia. The study's sampling frame is a thorough list of the names of the academic staff of public universities in Malaysia. As a result, the proper sample size for this analysis was 385 employees (Sekaran, 2003). The researcher distributed 385 surveys and received responses from 354 respondents. Following a review of each, the researcher eliminates questionnaires with unanswered questions. As a result, the researcher collected 323 valid questionnaires from respondents (with an 84 percent response rate). Additionally, data were analyzed using Confirmatory Factor Analysis (CFA) and Structural Equation Model (SEM) techniques with AMOS software.

Table 1: Summary Table of Instruments

VARIABLE TYPE	ITEMS	SOURCES
Dependent Variable		
Job performance	14	Borman & Motowidlo (1997)
Independent Variables		
Personality traits	29	Goldberg et al., (2006)
Motivation	10	Bliss (2008)
Learner autonomy	28	Confessore & Park (2004)
Leadership style	28	Bass & Avolio (1990)

4. Results and Discussion

This study is interested in determining the influence of personality traits, employee motivation, learner autonomy, and leadership styles on job performance. The results of the descriptive analysis of this study are displayed in Table 2 below.

Table 2: Descriptive Analysis of Respondents (N=323)

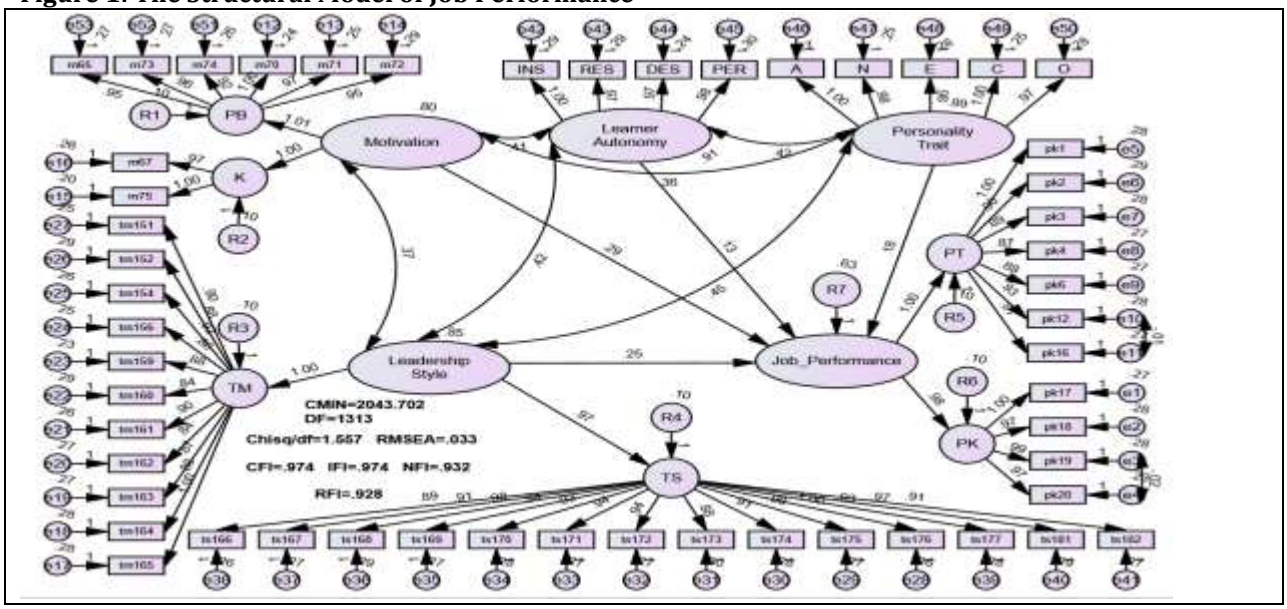
Items	Categories	Frequency	Percent
Gender of Respondents	Male	136	42
	Female	187	58
The Current Age of Respondents	25 or below	21	6.4
	26-35	83	25.6
	36-45	90	28
	46-55	90	28
	56 or above	39	12
Education Attainment of Respondents	Master	140	28
	PhD/DBA	103	20
Length of service	3 years or less	14	4.4
	3 - 6 years	67	20.6
	7 -10 years	71	22
	11 -14 years	90	28
	15 – 18 years	39	12
	18 years or more	42	13

A review of goodness of fit criteria was used to determine the applicability of Structural Equation Modeling (SEM). The measure of goodness of fit in SEM is based on arguments by Hair et al. (20 and includes the X2 or chi-square statistics, the GFI (Goodness of Fit Index), the AGFI (Adjusted Goodness of Fit Index), the CMIN/DF, or the minimum sample discrepancy function divided by the degree of freedom, the TLI (Tucker Lewis Index), and the CFI (Comparative Fit Index) (2013). The final output indicates that the structural equation model fits the sample data satisfactorily. Figure 2 illustrates this structural model more clearly. For models with a good fit, the chi-square normalized by degree of freedom (Chisq/df) should be less than 5.0 (Bentler, 1990; Bhattacherjee, 2001), Comparative Fit Index (CFI), should all be greater than 0.90 (Anderson & Gerbing, 1988; Zainudin, 2015), and RootMean Square of Error Approximation (RMSEA) should be less than 0.08 (Cunningham, Preacher, & Banaji, 2001; Hooper, Coughlan, & Mullen, 2008). For the current model, we achieved all the requirement indices (Chisq/df = 1.557; RMSEA = 0.033; CFI = 0.974) and concluded it was appropriate for the next step. Further, the reliability and validity tests were quantified through composite reliability (CR > 0.70; Nunnally & Bernstein, 1994), AVE > 0.50 (Fornell & Larcker, 1981), and discriminant validity (square root AVE must exceed every construct correlation) as exhibited in Table 3. These results permitted us to design the model of this study, which is shown in Figure 1.

Table 3: Composite Reliability, Convergent Validity, and Discriminant Validity

Construct	CR	AVE	Discriminant Validity
Personality Traits	0.943	0.767	0.821
Motivation	0.938	0.884	0.825
Learner Autonomy	0.926	0.757	0.786
Leadership Style	0.944	0.893	0.881
Job Performance	0.903	0.949	0.925

Figure 1: The Structural Model of Job Performance



The multivariate kurtosis in this study is less than 50.0, indicating that this model was normal. Meanwhile, all variables are satisfied because the skewness value is between -1.5 and 1.5. (Awang, 2015). As a result, this model is admissible for hypothesis testing.

Table 4: Assessment of normality

Variable	**Min**	**Max**	**Skew**	**c.r.**	**Kurtosis**	**c.r.**
Personality	3.000	8.000	-.011	-.100	-.178	-.814
Motivation	2.000	8.000	.162	1.478	-.115	-.526
Learner	-1.000	6.000	-.161	-1.467	.473	2.160
Leadership	2.000	8.000	-.052	-.477	.071	.322
Job Performance	.000	7.000	-.169	-1.538	.095	.435
Multivariate					**6.652**	**.974**

The regression weights for the determining factors affecting job performance are shown in Table 5. The critical ratio (CR) and probability were used to evaluate the hypothesis (P). Based on the previously mentioned results, the hypothesized relationships were tested to develop a structural model for this research study. The results are presented in Table 5 where all the proposed relationships are found significant.

Table 5: Regression Weight of Determinant Factors on Job Performance

			Estimate	S.E.	C.R.	P	Result
Job Performance	<---	Personality Traits	.292	.057	5.166	***	Significant
Job Performance	<---	Motivation	.127	.053	2.401	.016	Significant
Job Performance	<---	Learner Autonomy	.179	.053	3.362	***	Significant
Job Performance	<---	Leadership styles	.250	.056	4.460	***	Significant

Hypotheses 1, 2, 3, and 4 examine the effects of personality traits, motivation, learner autonomy, and leadership style on job performance. The results revealed that personality traits (β = 0.292, CR = 5.166), motivation (β = 0.127, CR = 2.401), learner autonomy (β = 0.179, CR = 3.362), and leadership styles (β = 0.250, CR = 4.460) were statistically significant to job performance. It was found that the proposed model explained a highly significant percentage of the variance in job performance = 63%. Cohen (1988) contends that R^2 exceeding 26% is considered to have a large effect in a causal model. Therefore, a model that involves measuring the level of job performance is sufficient and meaningful since it contributes a high impact to the research on job performance. In addition, we supported hypotheses 1, 2, 3, and 4 as reported by the SEM approach. This research found that four constructs are significant in influencing employee job performance.

Personality traits have the greatest impact (β = 0.292) followed by leadership styles (β = 0.250), next learner autonomy (β = 0.179), and lastly motivation (β = 0.127). Based on the findings gained in this study, first, personality traits were found to have a positive effect on job performance (p-value = 0.000) among academic staff. Personality is explained by using a Big-Five model of personality, namely extraversion, agreeableness, openness to experience, neuroticism, and conscientiousness. This means that the Big-Five model of personality traits contributes to changes in job performance. This finding has been supported by the Study of Mehmood, Mehmood, and Siddique (2017), which shows that there is an influence between personality traits and job performance. The findings of this study also show that personality traits are predictors of job performance (Othman & Fatimah, 2014). This is supported by the findings of the study by Ahmad et al. (2014). De Jonng et al. (2019) show that personality traits are one of the factors that influence job performance. From the results of hypothesis testing, it is found that this model is significant in making assumptions about the influence between leadership style and the job performance of academic staff.

H2 is supported (p-value = 0.016) which means that motivation has a significant effect on job performance. Based on the above, the hypothesis suggested that higher motivation will report possessing greater job performance is supported. From the results, it is found that this model is significant in making assumptions about the influence between motivation and job performance of the academic staff. This significant relationship means that higher motivation will result in higher job performance. Therefore, it is necessary to control the performance-driven motivational variables to create motivation to improve job performance. The findings of this study are in line with the opinion (Ali, 2020; Springer & Gary, 2011) that one of the ways management can improve staff work performance is through giving encouragement or motivation. Theoretically, this study is supported by the findings of a study by Maneetr & Thirachaya, (2010) which shows that there is a relationship between motivation and job performance.

Meanwhile, H3 proposed a relationship between learner autonomy and job performance is accepted as p value=0.000. This hypothesis suggested that job performance with good learner autonomy will report possessing greater job performance supported. This study contributes to a new field of knowledge which is the concept of learner autonomy in the workplace. The findings of this study show that learner autonomy influences job performance. This study shows that learner autonomy is a key indicator for individuals to be more high achieving. This means that individuals with high learning autonomy have higher job performance. Accordingly, this study aims to propose a comprehensive definition and concept of learner autonomy and a theoretical position for further study in the field of organizational psychology and its relevance to the concept of learner autonomy in the workplace. The results of this study are in line with the study by Ellingson et al. (2017) who showed that there is a relationship between learner autonomy and job performance when academic staff who have high learner, autonomy tend to have high job performance. On the other hand, staff with low levels of learner autonomy tend to have low job performance. Researchers conclude that the job performance of

academic staff is influenced by learner autonomy, and this is in line with the theory of Planned Behavior (TPB) a high level of learning autonomy will encourage these staff to improve job performance. This is because staff with high learning autonomy will learn proactively. Indicators of high levels of learning autonomy are, always eager to perform new tasks, proactive to innovate, and strive to find the best way to perform tasks.

The last H4 was also found significant as p-value = 0.000 and leadership styles were found to have the greatest influence on job performance among academic staff. The findings of this study are seen in line with the findings of previous studies. This significant positive relationship means that the better the leadership style of the leader the better the performance of the staff. Leaders with good leadership styles (transformational and transactional leadership styles) will report possessing greater job performance is supported. From the results of hypothesis testing, it is found that this model is significant in making assumptions about the influence between leadership style and the job performance of academic staff. The findings of this study are seen in line with the findings of previous studies. This result shows that the leadership style factor contributes to the change in job performance. Through the leadership styles discussed, it can be concluded that transformational and transactional leadership styles are appropriate to use and influence the leadership pattern of the leader whether perfect or vice versa, inverted and make the situation ineffective. These findings have been supported by studies (Al-Malki et al. 2018). The above analysis indicates that all hypotheses in this study are accepted. The summary of hypotheses testing in this study can be seen in the following table.

Table 6: Summary of Hypotheses Testing

	Hypothesis	Conclusion
H_1	Motivation has a positive significant influence on job performance	Accepted
H_2	Personality trait has a positive significant influence on job performance	Accepted
H_3	Leadership style has a positive significant influence on job performance	Accepted
H_4	Learner autonomy has a positive significant influence on job performance	Accepted

5. Conclusion

In conclusion, the study proves that dimensions of personality traits, employee motivation, learner autonomy, and leadership style influence job performance among academic staff. Besides that, this research shows that employee motivation is the most significant factor that influences job performance. It is further concluded that learner autonomy in the workplace represents one of only a handful in extant literature. It thus offers a novel perspective in the field of human resource management. Based on the results, there is a need for the management of the public university to give attention to the job performance of employees with special attention to their motivation and learner autonomy. This will enhance and improve the quality of service delivery in the organizations.

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Investigating Factors Affecting Fans' Intention to Attend Anime Events: Conceptual

*[1]Mashita Abdul Jabar, [1]Shareenie Shera Abdul Hamid, [1]Zaity Akhtar Mukhtar, [1]Nik Rozilaini Wan Mohamed, [2]Shahira Abdul Jabar, [3]Mohd Shafiq Abdul Jabar
[1]Faculty of Hotel and Tourism Management, Universiti Teknologi MARA Cawangan Melaka, Malaysia
[2]Faculty of Business Management, Universiti Teknologi MARA Cawangan Johor, Malaysia
[3]Centre of Modern Languages, Universiti Malaysia Pahang, Malaysia
*mashita@uitm.edu.my

Abstract: This study proposes a conceptual framework to investigate the factors influencing anime fans' intention to attend anime events. As the popularity of Japanese animation (anime) proliferates globally, anime events have emerged as a distinct tourism market segment. However, academic research on anime event attendance factors is limited. This study aims to address this gap by developing a framework integrating three key factors frequently highlighted in the general event and fan culture literature: event image, travel motivations, and media information. Event image denotes attendees' holistic perceptions encompassing cognitive and affective dimensions. Travel motivations refer to internal and external drivers stimulating the intention to attend, such as escapism, socialization, and novelty-seeking. Media information represents sources informing attendees' perceptions and decisions through platforms like social media and websites. The framework posits that these three factors directly influence fans' intention to attend anime events. A quantitative methodology will be utilized to collect survey data from anime communities and analyse the model via PLS SEM techniques. The framework contributes a theoretical understanding of anime event attendance, validates linkages between factors, and provides practical implications for event organizers and marketers to enhance the appeal and competitiveness of anime events. Further research could extend the model's generalizability, explore causal mechanisms between factors, examine additional variables, and conduct longitudinal studies on evolving attendee behaviour and preferences.

Keywords: *Anime events; event image; travel motivations; media information; intention.*

1. Introduction

The influence of anime has extended beyond the borders of Japan, reaching various countries worldwide. Based on the Anime Industry Report published by the Association of Japanese Animations in 2023, it was found that the Japanese anime industry witnessed remarkable growth, with the global market value of the anime-related sector surpassing 2.74 trillion Yen in the year 2021. The market's international value increased from 2.42 trillion Yen in 2020 to 2.74 trillion Yen in 2021. According to the Association of Japanese Animations (2023), the United States has emerged as the leading country in terms of the overseas expansion of the Japanese anime market, followed by Canada, China and Taiwan. The pop culture phenomenon of anime originated in Japan but has proliferated worldwide, amassing devoted followers across global fan communities. Anime fan events like ComicCon have grown exponentially in scale and popularity, now attracting millions of attendees annually across various nations. For instance, the Anime Expo in Los Angeles drew over 350,000 attendees (SPJA, 2023), reflecting extensive reach and appeal. Anime, as defined by Tung et al. (2017), encompasses Japanese animation and comics, commonly known as manga.

It is distinguished from Western animated films, such as those produced by Disney, Pixar, and DreamWorks, through various aspects, including production creation, budget allocation, artistic style, duration, market media, and audience market value. In addition to comics and video games, anime contributes to the formation of the ACG (anime, comics, and games) subculture and exerts substantial global influence (Tung et al., 2017). The tourism industry has witnessed the emergence of anime tourism as a distinct and specialised market, owing to the growing influence of anime. According to Tung et al. (2017), anime tourism refers to visiting locations either depicted in or associated with anime or manga. Anime fans refer to anime consumers who have a particular affection for certain anime works and possess a higher level of knowledge of the anime world. Anime tourism has emerged as a rapidly growing niche within popular culture tourism, with dedicated anime fans travelling great distances to visit sites featured in their favourite series; however, the sector still faces several issues and challenges impacting its future development and sustainability. Firstly, synchronisation and cooperation between the anime business and the tourism industry.

Anime tourism remains a specialised and inadequately recorded occurrence, resulting in a dearth of information and assistance for enthusiasts seeking to visit the sites featured in anime. Furthermore, the tourism business may possess an incomplete comprehension of the distinct requirements and anticipations of anime tourists, who deviate from the conventional tourist demographic (Mori, 2022). Next, the detrimental effects of anime tourism on the ecosystem and the indigenous culture. Anime tourism has the potential to disrupt and harm the natural and cultural legacy of sites, particularly when these locations are situated in rural areas or on private property. Certain anime tourists may exhibit a lack of regard for the regulations and conventions of the local community or may engage in inappropriate or unlawful conduct (Rehan, 2022). For instance, certain anime visitors may engage in littering, trespassing, or unauthorised photography. This might also lead to confrontations and animosity between anime tourists and local residents, which could have negative implications for the reputation and perception of anime tourism. Moreover, the success of anime tourism relies heavily on the popularity and calibre of anime productions, which might fluctuate over time. Thus, anime tourism is susceptible to the peril of diminishing its allure and demand should the anime productions become obsolete or lose their fanbase. Furthermore, anime tourism may have limited appeal to a broader spectrum of travellers.

As it primarily caters to a specialised demographic of anime lovers, such as otaku or avid anime consumers (Mori, 2022). Hence, it is imperative to enhance innovation and diversification of anime tourist offerings and services, with intensified promotion and marketing of anime tourism to the international market. The impact of Japanese animation on the tourism industry is an emerging research area that requires more in-depth scholarly attention. Although anime and manga are gaining popularity among various segments of society globally, academic studies examining the connection between this phenomenon and tourism are still limited (Kirillova et al., 2018). The success of anime events relies heavily on the attendance and participation of fans. However, the factors that influence fans' decision to attend anime events have not been extensively studied. Much of previous research done on intention to attend events has primarily focused on various types of events such as cultural festivals, music concerts, and sports events. Based on the aforementioned context, the current study aims to investigate the determinants that drive anime fans' intention to attend these events. This study seeks to bridge this gap by proposing a conceptual model synthesizing three salient factors highlighted frequently across literature on events i.e. conventions, festivals, and fan cultures: (1) event image, (2) travel motivations, and (3) media information. By gaining a better understanding of these factors, event organizers and marketers can better meet the needs and preferences of anime fans, ultimately enhancing their event experience and increasing attendance rates.

2. Literature Review

Events: According to Ritchie (1984), events could be world fairs/expos, carnivals/festivals, sporting events, cultural/religious occasions, historical turning points, commercial/agricultural occasions, or political personage occasions. It has repeatedly been discovered that they have the potential to raise a destination's competitiveness in terms of drawing tourists (Getz, 2008). Events have a substantial impact on the appeal of a place, the satisfaction of visitors, and the general growth of tourism. Tourism events involve a diverse array of activities, such as cultural festivals, sporting tournaments, commemorative events, and entertainment gatherings. These events have a crucial impact on recruiting tourists, shaping the destination’s image, and contributing to the economic and social growth of the host area (Getz, 2008). Event tourism highlights the significance of events as attractions, drivers of infrastructure growth, and enliveners of public areas, hence enhancing the overall attractiveness and competitiveness of a destination (Getz, 2022).

Events have a multidimensional impact on tourism, since they play a crucial role in motivating travel, affecting the behaviour of visitors, and contributing to the entire tourism experience (Presenza & Sheehan, 2013). Events are perceived as catalysts for the development of tourism destinations, drawing in various groups of visitors and improving the overall experience for visitors (Presenza & Sheehan, 2013). Furthermore, events have a crucial role in fostering emotional involvement and dynamic involvement, enabling tourists to generate distinctive and unforgettable experiences (Folgado-Fernández et al., 2021).

Moreover, events are essential to administrating destinations and play a pivotal role in marketing and developing those destinations. Efficiently organising and carrying out events is crucial for improving the

competitiveness of a location and adding to its overall attractiveness (Pivac et al., 2019). The societal ramifications of events are also a crucial factor in the process of tourist planning and policymaking. Inadequately organised and disruptive events can result in unfavourable experiences for both local populations and tourists, underscoring the significance of assessing the social consequences of events for efficient destination management (Wallstam et al., 2018).

Events in tourism have a diverse and important role, serving as attractions, accelerators for development, drivers of destination competitiveness, and contributors to the total tourism product. Events significantly influence destination marketing, visitor experience, and social development, making them essential components of the tourism sector.

Event Image: The definition of event image is the cumulative interpretation of consumers' meanings or associations attributed to events (Gwinner, 1997). In other words, the event image depends on the type of event, the event's features, and individual factors. The similarity between an event's image and a destination has been extensively discussed in academia. Affective and cognitive components from the destination image may also be present in the event image (Kaplanidou and Vogt, 2007). If anime events are considered attractions for tourism, similar to destinations for vacations, the concept of event image can closely resemble the idea of destination image. This means that event images can be evaluated holistically, taking into account overall perceptions, just like destination images (Baloglu & McCleary, 1999). In this context, holistic or global image perceptions encompass both cognitive and affective aspects. This holistic approach can provide a more efficient way to understand how the image is evaluated.

The effects of anime event images are significant in enhancing visitor revisit intention and creating a positive perception of the event and the destination. The image of an event plays an important role in increasing the intention of visitors to revisit a regular event. Additionally, using a dramatized event by a promotional film positively affects spectators' attitudes towards the destination as well as the event itself (Zamir et al., 2018). The ability of the comic image to overcome cultural barriers and the importance of the anime culture for the economy highlights the need for optimal strategies to promote manga and anime products in the market (Ananda et al., 2016).

Furthermore, the way an event is perceived by potential attendees can greatly impact their interest in participating. For instance, if an event is regarded as prestigious and well-organized with a strong track record of delivering high-quality experiences for attendees, fans are more likely to be drawn towards it. This positive image instils a sense of excitement and anticipation among potential attendees, increasing their motivation to attend. Event organizers invest considerable effort into crafting attractive event images through promotional materials such as posters, flyers, and online advertisements. These visuals create an initial impression on individuals, which can shape their perception of the event.

As there is a lack of specific studies addressing the event image of anime events, it becomes necessary to draw insights from the existing literature on the event image of other types of events, such as sports events, and international mega-events. A positive event image generates excitement and anticipation among fans. When an event is perceived as well-organized, immersive, and aligned with fans' interests, it becomes a highly anticipated gathering that fans eagerly intend to attend. Wang and Butkouskaya (2022) revealed that a favourable event image positively influences tourist behavioural intention in sport tourism. Another study uses a cultural festival as a case study to explore the impact of event images on attendees' satisfaction and behavioural intentions. The findings reveal that a positive event image significantly influences attendees' satisfaction and behavioural intentions (Eddosary et al.,2015). This suggests that individuals' perceptions and emotions towards an event can influence their intention to attend. Thus,
H1: Event image will have a significant, positive influence on fans' intention to attend anime events.

Travel Motivations: Travel motivations have a significant impact on the intention to attend anime events. The desire to interact with other anime fans, the wish to visit new locations, and the opportunity to interact with local people are important motivators for anime fans to attend anime events (Akinori et al., 2020). Veronique et al. (2022) emphasised that motivation for novelty and the desire to experience something new and different are key factors that drive pop culture fans to attend pop culture events, including anime events. Moreover,

watching anime series enhances the purchase intention of anime fans, leading to a higher likelihood of attending anime events.

Motivation, which emerges from a state of need and compels individuals to take specific actions to achieve satisfaction, is crucial in guiding human behaviour towards desired goals. Kirillova et al (2018) found three central motivation factors that came to the forefront of anime attendees. Firstly, attendees are drawn to these events by the opportunity to blend reality with fantasy. The immersive experience of stepping into the fantastical worlds of their favourite anime can be a powerful motivator. Secondly, the sense of social belonging within the anime community plays a significant role. Attendees often seek to connect with like-minded individuals who share their passion, creating a sense of belonging and camaraderie. Lastly, and perhaps most intriguingly, is the motivation for self-development. Anime events offer attendees more than just entertainment; they provide opportunities for personal growth and development, making self-development the most prominent motivation factor.

Building on Kirillova's foundation, Liu et al. (2020) study developed a comprehensive anime tourism motivation scale with five distinct dimensions. This scale encapsulates a broader spectrum of motivations, including the quest for authentic anime experiences, the pursuit of novelty, the need for relaxation and escape, the desire for socialization with fellow fans, and the exploration of anime culture. These dimensions offer a more comprehensive understanding of the diverse motivations that drive anime tourists. Different individuals may have varying motives for attending such gatherings. For some fans, attending an anime event provides an opportunity to immerse themselves in their favourite series or characters. They may be motivated by the chance to meet voice actors or participate in cosplay competitions where they can showcase their creativity and passion for the anime culture. Others may view these events as opportunities for networking within the community or discovering new merchandise related to their favourite shows or manga series. Thus,
H2: Travel motivations will have a significant, positive influence on fans' intentions to attend anime events.

Media Information: Information sources greatly impact fans' decision-making when considering whether to attend an anime event. Media sources provide information shaping awareness and perceptions of events for potential attendees (Lee et al., 2014). In today's digital age, information is readily available at our fingertips through platforms such as social media and dedicated websites. Fans rely on these sources to gain knowledge about upcoming events, the lineup of guests, panel discussions, and other interactive activities. Communicated via platforms like advertisements, websites, brochures, social media, and fan community channels, information can influence fans' event image and decisions. Content about activities, access, and community contextualized to the target audience can motivate participation. Interactions frequently occur on anime fan networks like forums and group chats that could encourage attendance through shared experiences. The availability of detailed and accurate information is crucial for fans in making informed decisions about attending an event. Moreover, positive feedback or reviews from previous attendees can enhance the credibility and desirability of a particular anime event.

The impact of media information on the intention of anime fans to attend anime events is complex and has multiple aspects. Evidence from research indicates that social media, when utilised as a marketing tool for events, significantly influences the choices of fans to attend those events (Harb et al., 2019). These findings indicate that utilising social media platforms to disseminate information and promote anime events can substantially influence the inclination of anime enthusiasts to participate in these events. Moreover, it is essential to comprehend the travel motives of enthusiasts of popular culture to fully capitalise on the advantages of attending events and stimulate a willingness to take action (Labuschagne & Burger, 2022). Hence, media content pertaining to travel and cultural encounters conveyed through several platforms, can impact the inclination of anime enthusiasts to participate in events.

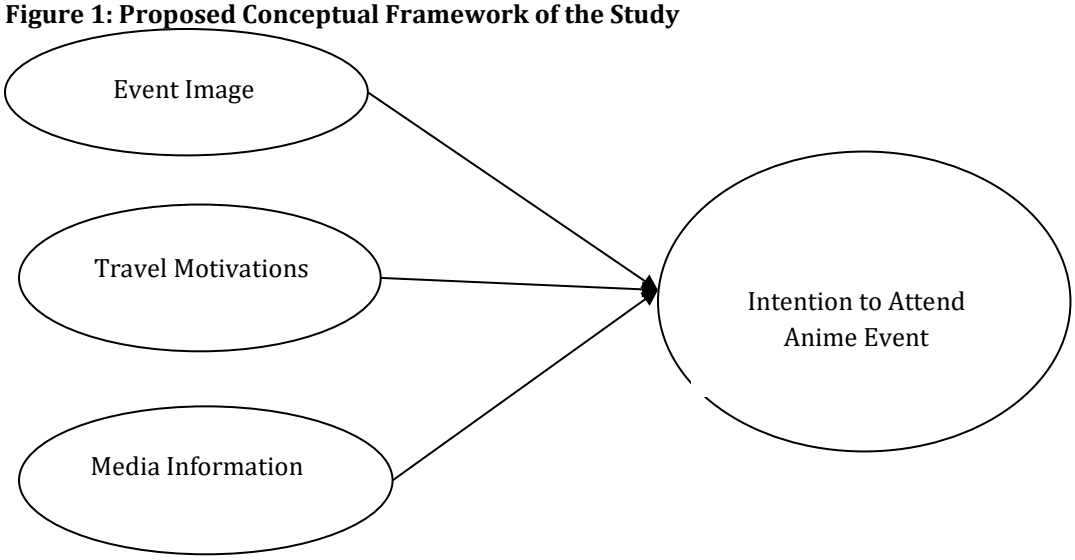
In addition, cosplayers are driven to engage in anime fandom due to a range of motives, including a sense of belonging, aesthetic admiration, and the desire to escape from reality (Reysen et al., 2018). Media content that emphasises these features and promotes the distinctive experiences provided at anime events can influence the inclination of anime enthusiasts to attend. Moreover, the utilisation of attitude functions, self-efficacy, and norms as predictors of attitudes and intentions to utilise mobile devices for accessing social media while attending sporting events highlights the importance of media information in influencing fans' attitudes and

intentions towards participating in such events (Wang, 2014). These findings indicate that tailored media content pertaining to anime events can influence the attitudes and intentions of those who are anime lovers. Furthermore, an analysis of fans' motivations for fictional texts indicates that both hedonic and eudaimonic objectives are linked to participating in fan behaviours that include deep engagement with the text (Taylor, 2021). This observation emphasises the significance of media content that addresses the many motivational aspects of anime enthusiasts, which could impact their inclination to participate in anime events. Ultimately, media information significantly influences the inclination of anime enthusiasts to participate in anime events by moulding their attitudes, motivations, and aspirations through focused promotion, travel incentives, and the depiction of distinctive encounters.

Few research studies provide insights into the influence of media information, particularly through social media, on fans' intention to attend events. Woojin and Paris (2013) found that knowledge-sharing through social media platforms like Facebook, can influence users' intentions to attend special events. Another study showed that fans' decisions to attend events are strongly influenced by their behavioural intentions towards using social media (Harb et al., 2019). This indicates that effectively utilising social media platforms can attract and engage fans, ultimately increasing their intention to attend anime events. While the studies may not directly focus on anime events, the underlying principles and findings can be applied to understand how media information influences fans' intention to attend anime events. Thus,
H3: Media information will have a significant, positive influence on fans' intention to attend anime events.

In short, anime events are cultural and entertainment activities that attract fans of Japanese animation (anime) from different countries and regions. These events offer various opportunities for fans to enjoy anime-related products, services, performances, and interactions. However, there have been limited efforts to conceptualize a model that can lead to a better understanding of the relationships among the key constructs influencing fans' intention to attend anime events. Therefore, this study proposes a conceptual framework that consists of three main factors: event image, travel motivations, and media information. Event image refers to the overall impression and perception that fans have about an anime event, based on cognitive and affective perceptions of the event's emotional, organizational, environmental, physical, and social aspects. Travel motivations refer to the internal and external factors that stimulate fans' intention to travel to an anime event. Travel motivations can include the opportunity to blend reality with fantasy, a sense of belonging, a need for escape and novelty. Media information refers to the sources and channels that fans use to obtain and share information about an anime event, such as websites, social media, blogs, magazines, or word-of-mouth. Media information can influence fans' awareness, interest, attitude, and behaviour towards an anime event. The proposed conceptual framework assumes that these three factors are interrelated and have direct effects on fans' intention to attend anime events. The relationships among these factors are shown in Figure 1. The arrows indicate the direction and strength of the causal links between the factors.

Figure 1: Proposed Conceptual Framework of the Study



3. Methodology

To evaluate the proposed model, quantitative data will be collected through an online survey, which will be posted on major anime online communities in Malaysia (e.g. Malaysia Anime Fanclub Facebook). Given that the population of interest – anime consumers (rather than actual tourists) – is a highly specialized interest group for which no sampling frame exists, online data collection was deemed the most appropriate method. According to Roscoe (1975), the most suitable and acceptable sample size in research is between 50 to 500 respondents. Thus, as many as 200 data of respondents will be collected. This is supported by Sekaran and Bougie (2019), who state that a sample size of more than 30 and less than 500 respondents is relevant for most social science research. A non-probability, convenience sampling technique will be used to select respondents. The descriptive data will be analyzed with SPSS software.

Besides the descriptive analysis, the data will be analyzed via PLS as the primary test of the hypotheses underlying the model. PLS-SEM is utilised to estimate intricate models of cause-and-effect relationships involving latent variables, and it is extensively employed in several fields of study. The method uses path coefficients to ascertain the magnitude and statistical significance of proposed connections between underlying components. PLS-SEM is a significant approach for forecasting, which emphasises the measurement of the variability in dependent variables by assessing the overall variability in observable indicators, rather than solely focusing on the correlations between all variables (Al-Romeedy, 2019). PLS-SEM has been widely employed in business research and is acknowledged for its efficacy in examining the connections between latent variables and indicators (Kock, 2016). Furthermore, PLS-SEM examines research hypotheses and analyzes data across diverse disciplines, such as healthcare, sociology, and economics (Kim et al., 2016; Mahfudzi & Fitri, 2022). The method is also utilised to investigate the correlation between consumer happiness, brand attitude, brand choice, and purchase intentions.

PLS is a variance-based, multivariate technique used in the analysis of causal or structural equation modelling (SEM) and estimates both the structural (or inner) relationships as well as the measurement (or outer) relationships (Hair, Hult, Tomas, Ringle, & Sarstedt, 2017). PLS facilitates the analysis of multiple dependent and independent construct relationships, empirically estimates the relative contribution of multiple construct measures, accommodates unobservable constructs, and is ideal for the early stages of theory building and testing where the research objective is to explain the variance of the endogenous constructs such as examining factors affecting fans' intention to attend anime events.

4. Conclusion and Recommendations

This study proposed a conceptual framework for examining the factors influencing fans' intention to attend anime events. The framework consists of three main factors: event image, travel motivations, and media information. The study hypothesized that these factors have direct effects on fans' intention to attend anime events. The study also aimed to test the validity and reliability of the framework using quantitative data collection and analysis techniques. The main contributions of this study are as follows:

(A) It provides a comprehensive and systematic understanding of the phenomenon of anime event attendance from the perspective of fans. Anime events are a form of cultural tourism that attracts millions of fans from different countries and regions every year. By exploring the motivations, expectations, satisfaction, and loyalty of fans who attend anime events, this study reveals the complex and dynamic nature of fan behaviour and preferences.

(B) It develops and validates a novel conceptual framework that integrates different factors. The framework incorporates the antecedents and outcomes of fans' intention to attend anime events. The framework will be empirically tested using data collected from 200 anime fans who have the intention to attend the Anime Festival. The anticipated results hopefully will show that the framework has a good fit and explanatory power and that all the hypotheses are supported.

(C) It offers practical implications and suggestions for anime event organizers, marketers, and policymakers to enhance the attractiveness and competitiveness of anime events. Based on the expected findings, this study

will provide recommendations on how to design, promote, and manage anime events to meet the needs and expectations of fans, as well as how to foster fan loyalty and retention. Moreover, this study highlights the potential benefits of anime events for the tourism industry and the local economy, such as generating income, creating jobs, and promoting cultural exchange and diversity.

(D) It opens new avenues for future research on anime fandom, culture, and tourism. Based on the findings and limitations of this study, the following recommendations are made for future research: (1) to extend the scope and generalizability of the framework by applying it to different types of anime enthusiasts such as otaku or general anime consumers; (2) to explore the causal mechanisms and interactions among the factors in the framework using advanced statistical methods, such as multilevel modelling; (3) to examine the impact of other factors that may affect fans' intention to attend anime events, such as personality traits, social norms, or perceived risks; and (4) to conduct longitudinal studies to investigate the changes and trends in fans' behaviour and preferences over time.

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Entrepreneurial Specific Factors, Support Factors and Micro enterprises Performance: The Case of Malaysian Microcredit Program

Norlaila Ibrahim[1]*, Rosman Mahmood[1], Ahmad Suffian Mohd Zahari[1] & Mulyana Mulyana[2]
[1]Faculty of Business and Management, UiTM Cawangan Terengganu, Terengganu, Malaysia
[2]Faculty of Economics, Department of Management Science, Universitas Islam Sultan Agung, Semarang, Indonesia
norla5454@uitm.edu.my*, rosmanma@uitm.edu.my, ahmadsuf@uitm.edu.my, mulyana@unissula.ac.id

Abstract: The objective of the study is to analyze the influence of several elements related to entrepreneurial-specific factors and support factors on the performance of micro-enterprises. The study sample consisted of a total of 756 micro-entrepreneurs who were involved in the two main microcredit programs in Malaysia, namely Amanah Ikhtiar Malaysia (AIM) and The Venture Group Economic Fund (TEKUN). The study's findings, obtained through multiple regression analysis, revealed that factors such as personal entrepreneurial competencies, management practice, microcredit programs and government support exert a significant influence on the performance of micro-enterprises. This finding is consistent with the Resource Base View (RBV) theory which links the importance of internal and external resources as a catalyst for competitive advantage and the performance of a business. The influence of family and commitment to religious principles is less significant. It was associated with the attitude factor of micro-entrepreneurs, who frequently disregard the fundamental principles of religion while making judgments. The impact of family influence on micro enterprises' performance was determined to be negligible. Family members make minimal contributions in terms of finances, energy, or moral support. The formulation of policies is crucial for these insights, which highlight the importance of providing entrepreneurship training and implementing excellent management practices. Additionally, financial support is necessary to promote the growth of micro-enterprises in Malaysia. The government plays a crucial role in facilitating the growth of micro companies by implementing various support programs. An efficient distribution system can minimize the leakage of programs and maximize benefits for the recipients who are intended.

Keywords: *Entrepreneurial-specific factors, Support factors, Performance, Micro enterprises, Micro-entrepreneurs.*

1. Introduction

The development of the business sector is one of the important agenda of the country nowadays. This is evidenced by the existence of various initiatives to help strengthen business activities in the community (Ismail et al., 2016). Entrepreneurship and business activities play a crucial role in bolstering the country's economy and enhancing the quality of life for its people. Nowadays, the younger generation is also increasingly involved in the field of entrepreneurship and business. Young people's involvement in the business is significant and this will have a positive impact on the country's economy if the business continues to grow and grow (Sayitkhonov, 2020). Entrepreneurship is a global issue that is often widely discussed, especially entrepreneurship that can increase the success of a firm (Kasemsap, 2017). Scientific discussions and efforts to find a positive relationship that can be linked between entrepreneurial activities and firm success are on the rise. The researchers focus on the field of entrepreneurship because it is a strategic field that is constantly changing with the times. According to the 12th Malaysia Plan (RMK-12) document issued by the Economic Planning Unit (EPU), the government will continue enhancing the entrepreneurship development program to cultivate the right mindset for individuals interested in becoming entrepreneurs.

The government's three-pronged effort in the 12th RMK is to create innovative and sustainable entrepreneurs; encouraging inclusive participation through Micro, Small & Medium Enterprises (MSME), cooperatives and agriculture-based associations as well as improving the entrepreneurial ecosystem is expected to increase the contribution of MSME to Gross Domestic Product (GDP) to 45 percent and cooperative income to RM60 billion in 2025. The Small and Medium Enterprise (SME) sector serves as the backbone of the economy in both developed and developing countries. Researchers around the world who are focused on SMEs concur that SMEs play a significant role in generating job opportunities and fostering economic growth, whether in a high-income country or a low-income country. In Malaysia, the government, through various agencies, plays a role in

attracting the interest of the community, particularly the Bumiputera community, to venture into the field of SMEs (Suhaila et al., 2013). Business performance is one of the primary concerns of stakeholders, including the owner, investor, suppliers, and employees in some cases (Madrid-Guijarro et al., 2009). Every SME's primary goal is to achieve high performance.

According to the researchers, the firm's performance strength will allow the firm and society to benefit by withdrawing resources, creating jobs, and generating wealth. Low-performing companies are frequently less competitive and have financial difficulties (Brigham & Houston 2004). As a result of changing and uncertain business environments, it is critical for firms to assess their performance over time (Najmi et al., 2005). The significance of SMEs in influencing the performance of the domestic economy extends beyond developing countries to developed ones (Beaver & Hutchings, 2005). Even in some economies, the role of the inner sector in economic development is more significant than the contribution of large industries. The dynamic development of SMEs serves as a catalyst for economic growth through various contributions including the provision of job opportunities (Audretsch, 2002; Amoah et al., 2022) generating an increase in GDP (Mujahid, 2019), fostering industrial sector development (Caner, 2004), promoting balanced growth (Hu, 2010), and meeting domestic needs. In the context of SME development in Malaysia, the government makes the sector an important mechanism not only to stimulate economic growth but also as a strategy to ensure a fair distribution of the economy among the races. The government hopes to involve more Bumiputera people in the modern sector by establishing a Bumiputera Trade and Industrial Society. In addition, the government established a microcredit program to provide financial assistance through various agencies.

The most active microcredit programs in Malaysia are Amanah Ikhtiar Malaysia (AIM), which pioneered the microcredit program in Malaysia, and The Venture Group Economic Fund (TEKUN). Thus, the microcredit program not only provides financial capital through credit products but also emphasizes social development programs to enhance operational management efficiency. Although microcredit is important for the development of small businesses, a significant portion of the literature on small entrepreneurship and business management fails to consider various additional factors that also impact the performance of microenterprises (Rosman & Rosli, 2013). The microcredit program delivery system consists of three important cores. One of the main focuses of the development program is exposure to various training and guidance programs, with a specific focus on cultivating entrepreneurial characteristics and promoting noble values. This paper differs from other studies on micro-enterprise performance because it addresses the issue from several studies on microcredit and micro-enterprise performance that have placed excessive emphasis on the sole impact of microcredit while neglecting other factors (Rosman & Rosli, 2013; Hietalahti & Linden, 2006; Copestake et al., 2001; Khandker et al., 1998). Therefore, this study focuses on some elements related to specific factors of entrepreneurship (personal entrepreneurial competency, management practices, religiousness) and supporting factors (microcredit programs, the role of family members, government) in the performance of micro-enterprises.

2. Literature Review and Hypotheses

Business performance, as defined by the classical economic theory, is an evaluation of the accomplishment of company objectives including profit, sales revenue, and business expansion. Company performance is linked to the accomplishment of several company objectives, such as upholding social responsibility, meeting customer needs and wants, and satisfying the demands of stakeholders, including owners, managers, shareholders, and employees. Stojkić (2019) emphasizes the need for effective performance measurement systems in SMEs to gain a competitive advantage and adapt to the dynamic business environment. The Resource-based view (RBV) is a theoretical framework employed in the analysis of organizational performance, drawing upon principles of corporate strategy and strategic management. This strategy entails the creation of value advantages, such as a competitive advantage for a company, by possessing valuable resources (Barney, 1991). The RBV theory places a strong emphasis on the role that company capabilities, resources, and practices play in establishing and maintaining competitive advantage (Miller, 2019).

Several researchers collectively suggest that the RBV theory is relevant for analyzing the relationship between business performance and its contributing factors. Valuable resources owned by the business such as information technology (IT) (Liang, 2009; Osakwe, 2022), human and organizational resources (Gruber, 2010;

Salsabila, 2022) have a positive effect on the business performance. Kohlberg's moral development theory, which is internationally recognized and serves as the foundation for numerous studies, posited that individuals progress through six moral judgment phases. According to Kohlberg, individuals across cultures share fundamental moral principles such as justice, equality, love, respect, and authority (Cetin, 2019). In his investigation, Stapleton (2013) examines the impact of religiosity on moral reasoning and discovers that individuals who are religious may exhibit different levels of moral reasoning when compared to those who are not religious.

He explains further that individuals who identify as non-religious will exhibit varying levels of moral reasoning compared to their religious counterparts. The influence of entrepreneurship-specific factors on the performance of SMEs is a crucial subject of investigation within the realm of business and economics. These factors encompass distinctive attributes (Zainol, 2018), actions, and tactics (Kaya, 2015; Soto-Acosta, 2016), that are inherent to entrepreneurs and directly impact the operational outcomes of their SMEs. A succession of pivotal studies has contributed to a comprehensive understanding of the impact of entrepreneurship-specific characteristics on the performance of SMEs. In Surya's (2022) study, it was found that the integration of entrepreneurial orientation, innovation, and market orientation is strongly linked to an improvement in the performance of SMEs. Our analysis delves into several essential factors, including Personal Entrepreneurial Competencies (PEC), managerial practices, and religion, and their influences on SME operational outcomes. By examining multiple perspectives, our understanding of the intricate interplay of these factors within this domain is enhanced.

Personal Entrepreneurial Competencies: The relationship between Personal Entrepreneurial Competencies (PECs) and the performance of SMEs has been extensively studied, with numerous research projects providing insights into this matter. Sarwoko (2013) and Pitakotuwa et al. (2017) have found a direct correlation between entrepreneurial traits and business performance. This assertion finds support in the work of Mamun & Fazal (2018), Baylie (2019) and Mejri & Zouaoui (2020). Agbenyegah (2020) further expanded upon this comprehension by demonstrating that the impact on SMEs' performance is not solely attributed to personal abilities, but also encompasses opportunity and strategic competencies in a collective manner. In addition, Fazal (2022) presented evidence that several motivational characteristics, such as self-confidence, openness to change, and pull factors, have a positive impact on the development of entrepreneurial skills. In turn, these competencies exert a significant influence on the sustainability performance of micro-enterprises. The significant role that PECs play in influencing the performance of SMEs is underscored by these collective findings. These findings also provide valuable insights into the way in which these competencies function as mediators between entrepreneurial qualities and business outcomes. Based on the consideration of these findings, we put forth the following hypothesis:
H1: Personal entrepreneurial competencies have a positive influence on the performance of micro-enterprises.

Management Practice: An extensive study has been conducted to explore the impact of management practices on the performance of SMEs, yielding several significant findings that indicate a favorable association between the two. According to Syed Abdullah (1991), the management practices of an organization, encompassing its philosophy, values, and strategies for addressing various corporate challenges, particularly those related to personnel, serve as indicators of its broader management approach. This statement emphasizes the crucial significance of management practices in shaping both the organizational culture and its resulting outcomes. Zakaria et al. (2016) highlighted the substantial influence of managerial practices on the success or failure of an organization, highlighting their overall significance. Additionally, in the context of performance management in SMEs, Ates (2013) conducted a comprehensive analysis of the discrepancy between theoretical concepts and practical implementation. The study emphasized the importance of these organizations cultivating proficient managerial strategies to enhance overall performance.

According to Forth (2018) and Forth (2019), SMEs can obtain notable benefits, including growth and improved productivity, through the adoption of formal management practices. This is especially true in areas such as human resource management and performance objective setting. The findings mentioned above collectively emphasize the practical importance of implementing excellent management practices to enhance the performance of SMEs. The significance of managerial practices in relation to company performance is readily apparent; yet Lindsköld (2018) observed that the extent of this impact may differ across SMEs and larger

corporations. However, it is important to note that these studies together emphasize the crucial significance of management practices in influencing the performance and growth trajectory of SMEs. Furthermore, they emphasize the necessity for SMEs to align their management methods with established best practices to achieve long-term success. Based on the considerations mentioned above, we put forth the following hypothesis:
H2: Management practices positively influence microenterprises' performance.

Religious Value Practices: Numerous studies have examined the impact of religion on the operations of SMEs, with varying and even contradictory results. The study conducted by Kamarudin (2013) on Malay entrepreneurs operating SMEs in Malaysia found that the influence of liberalism and religious faith on entrepreneurial ideals, strategy, and business performance varied. This emphasizes the intricate interplay between religion and business practices. Rasheed (2016) proposed how religion might influence financial decision-making by proposing a conceptual framework to investigate the influence of social and religious beliefs on SME owners' attitudes and intentions regarding formal finance adoption. Another example of the wider impact of religious beliefs on organizational culture was provided by Ghouri (2018), who hypothesized that the incorporation of religious orientation within SMEs, among other factors, could positively affect employee behavior. In contrast, Elias (2019) discovered that the level of religiosity among top management in Malaysian halal food and beverage SMEs did not significantly affect business performance, suggesting that the relationship between religion and business outcomes may vary depending on the specific context.

The relationship between religion and SME performance is multifaceted and complex, even though these researches offer a variety of results. Mahmood and Zahari's (2021) study emphasizes the importance of religion in influencing the performance of micro companies. They emphasized the significant influence of religious beliefs on business practices with their list of principles, which includes zakat pledges, humility, fairness in trade, and honesty. Based on research findings by Kissi et al. (2021), Raza et al. (2023) and ChoudhuryKaul et al. (2023) religious factors significantly have a positive influence on business performance. Overall, these studies highlight the importance of gaining a comprehensive understanding of the complex relationship between religion and SME performance, while also accounting for contextual changes that may impact this relationship. Taking into account the previously mentioned factors, we propose the following hypothesis:
H3: Religious value practices positively influence microenterprises performance.

Microcredit Programme: Significant findings from studies on how microcredit facilities affect the performance of SMEs demonstrate the favorable correlation between company success and microcredit availability. Mahmood et al. (2016) discovered a significant positive relationship between enterprise success and managerial competency, highlighting the significance of efficient management for the performance of SMEs. Notably, they discovered that the training components have an impact on the recipients of microcredit facilities, highlighting the need for skill development and training in utilizing microcredit to enhance company outcomes. Further research strengthens the validity of these conclusions. Three studies, Ekpudu (2016), Monge (2016), and Trisnasih (2020), all supported the beneficial effects of microfinance bank loans on the performance of SMEs, demonstrating the observable advantages of having access to capital.

More evidence that microcredit can stimulate revenue growth comes from Ruslan's (2020) discovery that SMEs with access to credit achieved higher sales than those without. To further highlight the complex relationship between microcredit and SMEs, Ramli and Zain (2022) provided evidence that the loan amount, management fees, and help and support from multiple organizations all had a substantial impact on the business success of microcredit borrowers in Kelantan. The papers presented in this collection, when taken together, provide a persuasive argument for the beneficial impact of microcredit facilities on the performance of SMEs. The articles demonstrate that SMEs when they have access to credit and are equipped with effective management and training, experience significantly improved chances of achieving success and growth. Based on these factors, we propose the following hypothesis:
H4: The microcredit program has a positive influence on the performance of micro-enterprises.

Family Members' Role: The impact of family members on the performance of SMEs is a subject of considerable complexity and diversity, as indicated by a number of scholarly investigations. According to Chu (2009) and González-Cruz (2016), their research indicates that family ownership has a notable and favorable impact on

the performance of SMEs. This underscores the potential advantages associated with familial participation in the management and operation of businesses. Nonetheless, Massis (2015) offered a nuanced viewpoint, suggesting that the relationship between family ownership and performance is represented by an inverted U-shaped curve. This suggests that while modest family ownership can be advantageous, excessive or insufficient family involvement can be detrimental to the success of SMEs, highlighting the significance of finding a balance. Additionally, Farrington (2018) stressed the importance of branding and marketing strategies in the context of family-owned SMEs, finding that the only factor that may potentially impact these companies' financial success was product differentiation. This emphasizes the particular elements of family-owned SMEs that may influence performance results. Adriansah and Mubarok (2023) contributed to the conversation by emphasizing the value of competent management and family engagement in the growth of small, family-run businesses.

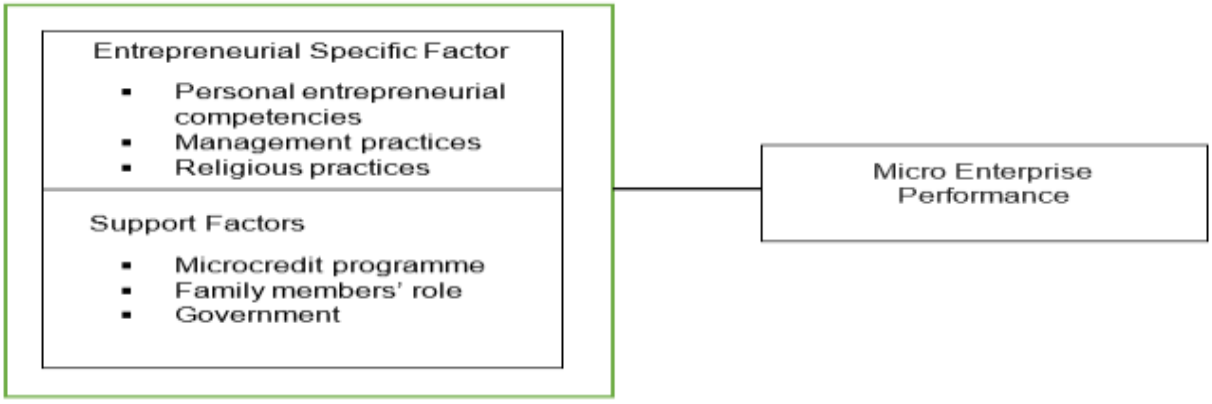
Their study underscored the importance of sound management and decision-making within the context of family enterprises. In summary, the body of research indicates that family engagement can impact SMEs' performance in both favorable and unfavorable ways. While there are benefits to family ownership, it is important to find a balance, and the exact impact of family engagement may vary depending on factors such as branding strategy and managerial techniques. The main takeaway is that, while family involvement in SMEs is important for economic success, it requires thoughtful consideration and skillful management to optimize benefits. Based on an extensive literature review, we propose the following hypothesis:
H5: Family members' role positively influences microenterprises performance.

Government Support: Numerous scholarly investigations underscore the noteworthy influence of the government on the operations of SMEs. Even though most researchers agree on the favorable outcome when SMEs receive government support, the support provided can vary across regions. Among the facilities provided by the government agencies are financial support (Liu, 2014; Wanambisi, 2017; Candiya Bongomin, 2018; and Aslam, 2023), government procurement (Liu, 2014 and Wanambisi, 2017), ICT facilities (Okundaye, 2019) and education support (Candiya Bongomin, 2018; Aslam, 2023). Wang (2017) clarifies the benefits of SME participation in public policy processes, demonstrating that SMEs who have a voice in determining government policy typically perceive the business environment more favorably. It emphasizes how crucial it is to include SMEs in the decision-making process when it comes to laws that directly impact their day-to-day operations. The study conducted by Campos et al. (2021) reveals a positive relationship between government support and the entrepreneurial behavior of firms, leading to increased internationalization in the marketplace.

This highlights the significance of recognizing the effectiveness of government support in stimulating business activity. Furthermore, Olayemi (2022) shows how well-planned government efforts can promote the establishment and expansion of SMEs, demonstrating how government intervention policies and programs greatly contribute to the growth of SMEs in Nigeria. However, research by Zulu-Chisanga et al. (2021) surprisingly reveals that government support does not have a significant effect on SME financial performance. These studies highlight the beneficial effects of government involvement and assistance in enhancing SME performance and fostering their expansion. A conducive atmosphere for SMEs to thrive and significantly impact the wider economy is mostly dependent on government incentives, policy participation, and intervention programs. Based on the extensive literature review, we propose the following hypothesis:
H6: Government support positively influences microenterprises' performance.

3. Research Framework and Method

Figure 1: Research Framework



Sample: This research focuses on two of Malaysia's most active microcredit programs, AIM and TEKUN. According to Table 1, the total population in the state for the two microcredit programs is 30,466 (AIM) and 16,432 (TEKUN). The data, as well as the list of program participants, were obtained from the state of Kelantan, a predominantly Malay state on Peninsular Malaysia's East Coast. As a result, the information was gathered from the AIM office and the TEKUN headquarters in Kelantan. The majority of the beneficiaries of these two schemes in Kelantan have been rural or sub-urban MSEs. A stratified sampling method is employed, where the population by the district is identified, and the sample size for each stratum is determined according to the population ratio. The population was then divided into strata (districts). The sample size for each stratum was determined by the population ratio of each stratum per total population. Following Sekaran (1992), 380 samples were chosen from AIM and 376 samples representing TEKUN based on Krejcie and Morgan's (1970) sampling table. Because the AIM microcredit program is only for women, all AIM samples are female. Women make up 42.6% of the TEKUN program. According to this distribution, women constitute the vast majority (71.4%) of the study sample.

Table 1: Population and Sample

Microcredit Program	Population	Sample*
AIM	30,446	380
TEKUN	16, 432	376
Total	46,878	756

*Sekaran (1992)
Source: Based on the sample survey.

The process of data collection through questionnaires is self-administered by the researcher with the assistance of several enumerators, conducted face-to-face with micro-enterprise operators who have been identified from the list of program participants. This method promises a higher response rate compared to other methods such as email and Google Forms. Before further analysis, several statistical tests were performed to ensure the reliability of the study data and the appropriateness of the analysis method. In reference to Table 2, the value of Cronbach's α for all study variables is above 0.7, as suggested by Nunnally (1978). This indicates the reliability of the variables utilized in the study model. The One-sample Kolmogorov-Smirnov test, which exceeds 0.5, confirms that the research data is parametric. This indicates that analysis can be conducted through multiple regression to clarify the research hypothesis.

Table 2: Reliability and One-Sample Kolmogorov-Smirnov Test

Construct	Reliability test		One-sample Kolmogorov-Smirnov test	
	Items	Cronbach's α	Kolmogorov-Smirnov Z	Asymp. sig. (two-tail)
Personal Entrepreneurial Competencies	15	0.908	1.077	0.197
Management Practice	15	0.895	1.136	0.151
Religious values	15	0.887	1.070	0.203
Microcredit program	14	0.816	1.179	0.124
Microenterprise performance	13	0.895	0.980	0.292

Source: Based on the sample survey.

Measurement of Variables: This study involves one dependent variable (micro-enterprises performance) and four independent variables (personal entrepreneurial competencies, management practice, religious values practices, and microcredit program). Measurement of the dependent variable is conducted through subjective methods commonly used by researchers such as Kotey and Meredith (1997), Gadenne (1998), and Swinney et al., (2006). There is a total of 13 items used for measurement, including sales revenue, profit earned, the number of jobs created and customer satisfaction. Respondents are required to evaluate their business performance over a three-year period on a scale of frequency ranging from, "1 - strongly dissatisfactory" to "7 - strongly satisfactory", The construct of personal entrepreneurial competencies is evaluated based on 15 items related to entrepreneurial characteristics possessed by respondents, such as leadership, willingness to take risks, creative and innovative, self-confidence and constant search for opportunities. Measurements for personal entrepreneurial competencies are made using a seven-point scale with a frequency of "1 = extremely low" to "7 = extremely high." Meanwhile, the management practice construct is evaluated based on 15 items covering four main aspects, namely marketing, finance, operations and human resources.

Respondents are required to state their level of agreement with the statement of management characteristics listed, based on a seven-point scale ranging from "1= strongly disagree" to "7= strongly agree." For the construct of religious values practices, there are 15 elements used to measure the religious values practices of an entrepreneur. These virtues include humility, patience, honesty, conducting transactions without usury, avoiding illegal income, being fair when dealing, no element of coercion in transactions, and halal sources. The measurement is based on a seven-point scale, with a frequency of "1 - extremely unimportant" to "7 - extremely important". Microcredit program variables are measured based on respondents' satisfaction with the delivery system, involving three important elements; credit product, operational efficiency and social development programme. This multidimensional measurement method aligns with the objective of the study to evaluate the performance of the business involved. Based on a seven-point scale, with a frequency of "1 = strongly dissatisfactory" to "7 = strongly satisfactory" respondents are required to state their level of satisfaction with the services and facilities provided.

4. Findings

The results of the descriptive analysis, including the mean and standard deviation, are presented in Table 3. Five variables exhibit a high mean, whereas only two variables display a lower mean value. The variable for religious practice has the highest mean value, which is 6.141, while the variable for government support has the lowest mean value, which is 1.694. In terms of the relationship between the variables, all show a positive value except for the relationship between the religious practice variable and the microcredit program, as well as family involvement. Most of the correlations between the variables are of a moderate level, however, the relationship between the variables of family involvement and government support exhibits a relatively weak connection. The results of the Collinearity statistics test indicate that the research data is parametric in nature, based on the values of tolerance (greater than 0.2) and VIF (less than 10). According to Pallant (2011), this explanation states that there is no issue of multicollinearity in the study data. This allows for the analysis of the study data using the multiple regression method.

Table 3: Descriptive Statistics and Correlation

Variable	Mean	SD	1	2	3	4	5	6
1. Personal Entrepreneurial Competencies	5.381	0.603	1					
2. Management Practice	5.158	0.721	0.548***	1				
3. Religious practice	6.141	0.487	0.152***	0.155***	1			
4.Microcredit program	4.855	0.652	0.319***	0.489***	-0.048	1		
5. Family members' role	1.694	1.053	0.117***	0.102***	-0.038	0.124***	1	
6. Government	2.106	1.151	0.082**	0.213***	0.071*	0.204***	0.017	1
7. Micro enterprises performance	5.076	0.690	0.446***	0.648***	0.092**	0.542***	0.126***	0.218***

Notes: $N = 756$, ***$P < 0.01$
Source: Based on the sample survey

Table 4 displays the results of the standard multiple regression analysis involving all six independent variables with the dependent variable. The total variance explained by the model was 50.6 percent, F (6,701) = 119.55, p < 0.01. According to the R2 value, all six independent variables considered in the study model can explain 50.6 percent of the variation in microenterprise performance. Referring to Table IV, the analysis of the study shows that the variable personal entrepreneurial competencies have a significant positive influence on the performance of micro-enterprises (β = 0.126, p < 0.001), therefore the study confirms H1. This finding is consistent with most previous studies (Pitakotuwa et al., 2017; Baylie, 2019; Mejri & Zouaoui (2020) which conclude that the higher the value of competencies, the better the performance of small businesses. The findings also show that management practice variables have an influence significant positive effect on the performance of micro-enterprises (β = 0.406, p < 0.001). Based on the empirical evidence, the study confirms H2, which is in line with previous studies, including Ates (2013), Zakaria et al. (2016), and Forth (2018). These studies indicate that efficient management contributes to overcoming challenges and positively impacts the development of the firm.

In relation to the religious variable, the analysis of the study indicates that this factor does not exert a significant influence on the performance of micro-enterprises. Consequently, the study does not provide confirmation for H3. The failure of entrepreneurs to adhere to noble values and perform religious practices thoroughly, along with the use of more rational judgment in decision-making, is an important factor in the achievement of less encouraging business performance (Rohaizat & Suzilawati, 2001; Glover, 1997). Analysis of the variables of the microcredit program and the performance of micro-enterprises also empirically shows that there is a significant positive relationship between the two variables (β = 0.317, p < 0.001). The findings of the study are consistent with the results of studies conducted by Mahmood et al., (2016), Ekpudu (2016), Monge (2016) and Trisnasih (2020). Based on the findings, the study confirms H4. In terms of family involvement, the study discovered that it does not affect business performance. This finding contradicts the findings of Chu (2009), Gonzalez-Cruz (2016), Massis (2015), and Farrington (2018). As a result, the study was unable to confirm H5. An empirical study of the government's role in assisting micro enterprises discovered a significant positive relationship between the two variables (β = 0.039, p < 0.05). The findings are consistent with the findings of Campos et al. (2016) and Olayemi (2022). As a result, H6 is supported.

Table 4: Multiple Regression Analysis

Model	Collinearity Statistics		Unstandardised Coefficients		Standardized coefficients	t	Sig
	Tolerance	VIF	β	Std Error	Beta		
(Constant)			0.451	0.296		1.522	0.128
Entrepreneur specific factors							
Personal Entrepreneurial Competencies	0.694	1.440	0.126	0.037	0.110	3.445	<0.001
Management Practice	0.571	1.750	0.406	0.034	0.420	11.951	<0.001
Religious practice	0.951	1.052	0.029	0.040	0.020	0.741	0.459
Support Factors							
Microcredit programme	0.718	1.393	0.317	0.034	0.296	9.458	<0.001
Family members' role	0.976	1.025	0.022	0.018	0.033	1.224	0.222
Government	0.937	1.068	0.039	0.017	0.065	2.374	0.018

Model Summary

Model	R	R2	Adjusted R2	Std Error of the Estimate	Change Statistics				
					R2 Change	F change	df1	df2	Sig. F Change
1	711[a]	0.506	0.502	0.49569	0.506	119.555	6	701	< 0.001

Predictors: (constant), personal competencies, management, religious, microcredit, family, government

Dependent variable: micro enterprises performance

Source: Based on the sample survey.

5. Discussion and Conclusion

The purpose of this study is to analyze various factors that are associated with the internal environment, specifically personal entrepreneurial competencies, as well as external factors, such as support factors. These factors have the potential to impact the performance of micro-enterprises. The study sample consisted of a total of 756 micro-entrepreneurs who had participated in the AIM and TEKUN microcredit programs. The data was analyzed through the standard method of multiple regression to explain the six research hypotheses. The research findings indicate that the performance of micro-enterprises is significantly influenced by four factors: personal entrepreneurial competencies, management practice, microcredit programs, and government support. Among those factors, it has been empirically shown that the management practice factor is the most significant element in influencing the performance of small companies. This finding is consistent with the resource base view (RBV) theory. According to Barney (1991), the ownership of various resources including human resources and organizations that have a certain uniqueness allows a firm to create a competitive advantage and subsequently business performance.

Although religion is thought to have a significant impact on business performance, the study's findings show otherwise. This failure can be attributed to the attitude of the majority of entrepreneurs, who frequently disregard religious values (beliefs and practices) when making business decisions. Their actions and behavior favoring more on rational considerations as explained by Kohlberg's theory. Family involvement, on the other hand shows no noticeable impact on the performance of micro-enterprises. This outcome may be attributed to a lack of family support, especially in financial terms, posing a major constraint for micro-entrepreneurs in managing their business. In terms of policy implications, the research findings clearly show the need for the formation of high entrepreneurial values to make micro-entrepreneurs more resilient, creative and innovative in line with the needs of the current environment. The emphasis on the innovation aspect is consistent with the core of the Economic Development Theory (Schumpeter, 1934) which emphasizes the role of entrepreneurs in economic development. Mastery of micro-entrepreneurs in aspects of management, especially finance and marketing, should be given priority to ensure that they can manage their business more effectively. Both

elements (personal entrepreneurial competencies and management practice) are seen as complementary to the microcredit program that involves financial assistance as business capital.

The provision of business capital through the microcredit program necessitates a high level of entrepreneurial ability, encompassing both elements, to guarantee the attainment of improved business performance. Entrepreneurs, in addition to the involvement of family members, also require the support of the Government to receive various assistance and advisory services. To ensure the effectiveness of the planned program with minimal leakage, it is necessary to design a specific delivery system mechanism. The application of religious values in its entirety is also perceived as an effective measure in guaranteeing the attainment of improved business performance. Entrepreneurs must adhere to values that touch on aspects of beliefs, which include keeping promises, being honest, exhibiting trustworthiness, refraining from practicing riba, and avoiding illegal income. From the perspective of religious practice, the practice includes prayer, fasting, and paying zakat. Adhering to all religious elements without exception and refraining from selective practice is imperative.

Limitations and Future Research

According to Kjellman et al. (2004), the performance of a firm is influenced by various factors including external and internal factors. However, this study only analyses two elements, namely the entrepreneurial-specific factor and the support factor. To obtain a more comprehensive picture, future research should broaden its scope and may take into account more factors including those related to human capital (level of education, business experience and training) along with other factors such as start-up capital, economic condition, business networks and business age. A more comprehensive approach will yield a more nuanced understanding of the multifaceted influences on firm performance. Although this study has made significant discoveries and contributions, it is important to recognize that there are some limitations. Initially, the research was limited to the geographical area of Kelantan, which is primarily inhabited by Malays and located in Malaysia. The limited scope of this study may restrict the applicability of the results to different cultural or geographical settings within Malaysia or other nations. Subsequent investigations could broaden the scope of the study by incorporating other geographical areas to improve the applicability of the findings. Furthermore, the study primarily focused on female participants, particularly those from the AIM microcredit program. The gender disparity may have impacted the results, as gender can influence entrepreneurial skills, managerial strategies, and the use of microcredit services. Future research endeavors should aim to achieve a more equitable gender distribution to comprehensively examine any potential disparities in micro-enterprise performance based on gender.

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Predictors of Severe Anxiety Among Bumiputera Students

Siti Fairus Fuzi*, Siti Ramizah Jama, Nordianah Jusoh, Siti Nursyahira Zainudin, Bushra Abdul Halim, Nurul Emyza Zahidi & Wan Hartini Wan Hassan
College of Computing, Informatics and Mathematics, Universiti Teknologi MARA (UiTM),
Kampus Alor Gajah, Melaka, Malaysia
ctfairus@uitm.edu.my*, ramizah@uitm.edu.my, dianah642@uitm.edu.my, sitinursyahira@uitm.edu.my, bushra270@uitm.edu.my, nurulemyza@uitm.edu.my, whartini@gmail.com

Abstract: Despite widespread vaccination efforts, the ongoing Covid-19 pandemic continues to affect the population globally. In mitigating and exerting control over the spread of the virus, a variety of measures have been carried out by countries worldwide. As a result, this has detrimental effects on citizens' mental health. University students are particularly among those significantly affected where they face challenges stemming from the pandemic and academic pressures. The purpose of this study was to explore anxiety along with the contributing factors of anxiety itself specifically among the students of Bumiputera at public university. The survey, conducted through a Google Docs Form, was distributed online from 13 August to 12 September 2021. Descriptive analysis was employed in assessing the anxiety levels of the Bumiputera students. Initially, in identifying the academic features, psychosocial attributes, Covid-19-related factors, socio-demographic characteristics, challenges in open and distance learning (ODL), previously achieved academic performance, current academic performance, and overall satisfaction with ODL that exhibit significant associations with anxiety, an independent-samples t-test or a one-way analysis of variance (one-way ANOVA) was performed. Finally, in identifying protective and risk factors related to anxiety among significant socio-demographic characteristics, ODL challenges, academic characteristics, psychosocial characteristics, COVID-19-related factors, and overall satisfaction towards ODL, multinomial logistic regression was conducted. Gender, sharing laptops/computers, difficulties in catching up with tough online courses, depressive thoughts, and experience of being quarantined because of close contact with positive COVID-19 individuals were identified as protective factors against anxiety symptoms while the field of study and overall satisfaction towards ODL were risk factors of developing severe anxiety.

Keywords: *Covid-19 pandemic, anxiety level, Bumiputera students, public university, open and distance learning.*

1. Introduction

The World Health Organization (WHO) made an official declaration of the COVID-19 pandemic as a global outbreak on January 12, 2020. In the year 2020, on 25th January, the first case of COVID-19 in Malaysia was identified, which originated from a number of three Chinese citizens who were in close contact with an infected individual in Singapore (BERNAMA, 2020). The initial case in Malaysia involved a male individual of age 41 returning from Singapore, which was verified in February 2020 as displaying symptoms such as fever and cough and subsequently underwent a quarantine at Sungai Buloh Hospital in Selangor ("[Breaking] 3 Coronavirus Cases Confirmed in Johor Baru," 2020). Various measures have been carried out by countries worldwide in striving to combat the virus from spreading. On 18th March in the year 2020, the first Movement Control Order (MCO) was initiated by the government of Malaysia, and this extended to the 3rd of May in the same year of 2020. With the implementation of MCO, stay-at-home orders were executed, outdoor activities and interstate travel were banned, and the closing of non-essential businesses was commanded (Lim, 2020).

The pandemic also posted significant challenges to the global education sector, compelling a switch of learning mode from physical classroom to online mode. Due to the limitations posed by the pandemic, online learning and teaching had to be fully embraced by a large number of institutions (Dhawan, 2020). A survey by the Ministry of Education revealed that 37 percent of students did not own the proper device (Lim, 2020). Although there were households with personal computers, they still faced challenges as devices were often shared among family members for work or study. The problems of an unconducive environment for learning, insufficient equipment, and being less familiar with digital technology further added to the complexity of the process of teaching and learning in the time of the pandemic (Abdul Hamid & Khalidi, 2020). The shift to online learning was particularly challenging in the East of Malaysia as a result of internet connection problems which are poor in the area (Sia & Adamu, 2020).

The COVID-19 pandemic heightened community anxiety, with increased deaths, media reporting, and new cases every day (Rubin & Wessely, 2020). The hurdles to e-learning resulted in increased anxiety for both students and educators. Institutions of higher education (IHEs) must address the effects of the COVID-19 pandemic psychologically and socially, requiring resilience-building measures (Centers for Disease Control and Prevention (CDC), 2020). In Grubic et. al.'s (2020) study, the emphasis was placed on the need for investigations on Covid-19's effects on students' mental health and the immediate interventions that are required. Given the ongoing infectious nature of COVID-19, studying anxiety severity among Bumiputera University students remains relevant. Bumiputera is defined as 'sons of the soil,' encompassing the indigenous inhabitants of the nation, comprising Malays, aborigines, and the natives of Sabah and Sarawak. The purpose of this study was to determine the levels of anxiety of Bumiputera University students in Malaysia during the period of pandemic. Additionally, the research investigated the impact of anxiety on previous and current academic performance, while identifying risk and protective factors influencing severe anxiety among Bumiputera students during this challenging period.

Scope of Study: This study focused on full-time Bumiputera students pursuing diplomas and bachelor's degrees in various fields at a public university from March to August 2021 academic session. These students were actively engaged in Open and Distance Learning (ODL), either on campus or from home, with a majority choosing to participate in ODL from their parents' residences.

Significance of Study: Due to the global pandemic of COVID-19, a mental health crisis has arisen, with prevalent anxiety disorders. This crisis is not an exception in Malaysia, emphasizing the significance of investigating factors contributing to the anxiety of Bumiputera students at public universities. Moreover, the study sought to explore the impact that anxiety has on these students in terms of their academic achievement academically.

Research Questions

The following research questions were formulated for the study:

- How does anxiety differ for overall previously attained academic performance and current academic performance respectively?
- How does overall students' satisfaction towards ODL differ for non-minimal, mild, moderate, and severe anxiety levels?
- What predictors contributed most to the likelihood of severe anxiety levels among Bumiputera students?

2. Literature Review

The higher education sector in Malaysia has undergone significant impacts due to the COVID-19 pandemic, leading to numerous hurdles for educators and students, particularly in teaching and learning (Sia & Adamu, 2020). In China, college students have been affected mentally by the pandemic which has been spreading continuously, along with the isolation measures that are strictly put into action and the impediment to reopening educational institutions (Cao et al., 2020). Lockdown, social distancing, strict isolation, emergency remote teaching, and uncertainties surrounding school and university openings have had substantial effects in terms of socio-psychological and student anxiety, despite contributing to the containment of COVID-19 in Malaysia particularly (Sundarasen et al., 2020). Moreover, it was determined by Cao et al. (2020) that severe anxiety was represented by 0.9% out of 7,143 college students in China, 2.7% with moderate anxiety and 21.3% was reported having mild anxiety.

While protective factors found against anxiety were urban areas as the place of living, stability of family income, and residing with parents, the state of having infected relatives or acquaintances is the risk factor related to increased anxiety. Additionally, Sundarasen et al. (2020) used Zung's self-rating anxiety scale (SAS) and discovered that 20.4% of 983 university students in Malaysia had minimal to moderate anxiety, severe anxiety represented by 6.6%, and the most extreme levels of anxiety with 2.8%. Additionally, it was observed by Odriozola-González et al. (2020) that higher anxiety levels were apparent in students in comparison to the population generally, with 21.34% of university students in Spain exhibiting symptoms of extremely severe

anxiety in the time of the pandemic. While, during the pandemic, self-reported symptoms of anxiety surpassed those reported before the pandemic (Burkova et al., 2021).

A cross-national study involving 23 countries revealed that women experienced higher levels of anxiety than men amid the COVID-19 upsurge (Burkova et al., 2021). It was discovered by Sundarasen et al. (2020), that factors linked to elevated anxiety levels included being female, of age below 18 years, age ranging from 19 to 25, studying at pre-university, studying in management and living alone. The study also highlighted that the contributing factors to anxiety in Malaysian university students were financial constraints, remote online teaching, along uncertainties about academic and future careers as primary stressors. From Cao et al. (2020), there was a positive association between economic repercussions, disruptions in daily life and academic delays and symptoms of anxiety while social support exhibited a negative correlation with anxiety levels. Other additional stressors identified included the impact Covid-19 has on education and potential employment (G. Wang et al., 2020), sensationalized broadcasts and unreliable news reports (Ayittey et al., 2020), students' residency, stability of family income (Peng et al., 2012), and diminished social interactions (Xiao et al., 2020). Beyond the uncertainties of academic and professional, the upsurge of depression and anxiety in university students is also contributed by the factor of insecurity in finance (Islam et al., 2020). A negative association was found between anxiety and satisfaction in online learning (Heckel & Ringeisen, 2019). According to Saadé et al. (2017), some anxiety forms were experienced by 30% of students in online courses. Meanwhile, Son et al. (2020) highlighted the difficulties that college students in the United States had to face during the transition to online classes.

Including concerns about sudden syllabus changes, class quality, technical issues, and the difficulty of learning online. Moreover, anxiety in online learning was deemed as the fear of information technology misuse, compromising the performance of the course (Saadé et al., 2015). The fear of COVID-19 infection, changes in daily lives, social isolation, loss of job, financial challenges, grief over the death of loved ones, and lonesomeness are among the key factors that lead to increased anxiety (Pietrabissa & Simpson, 2020). While predictors for COVID-19 fear identified included health anxiety, regular media use, social media use, and concerns for loved ones (Mertens et al., 2020). While lockdowns or quarantines were deemed essential for health physically (Wang et al., 2020), they could possibly be harmful in prolonged impositions (Germani et al., 2020). According to Shanmugam et al. (2020), the achievement of better mental health can be made by being compliant with medication, having strengthened support from family, and reducing substance-related psychiatric disorders. While, healthy lifestyle maintenance, social contacts nurture, acceptance of anxiety and negative emotions, promotion of self-efficacy, and provision of information on medical treatment access appeared as beneficial strategies in protecting against anxiety, depression and psychological distress (Petzold et al., 2020). Those included in vulnerable groups such as Covid-19 patients, those facing financial impacts, and those fearing infection, had more tendency to experience more psychological distress and are supposed to receive mental well-being support (Bahar Moni et al., 2021).

3. Research Methodology

Study population and Sample**:** In exploring anxiety levels of Bumiputera students at a Malaysian public university amid the COVID-19 and the Movement Control Order (MCO) phase, cross-sectional research was undertaken. The study encompassed students having full-time diplomas and bachelor's degrees across 7 diverse faculties within a Malaysian public university. A number of 3 separate university campuses were involved in the study in which the students were enrolled in. The sample consisted of participants who were enrolled in semester two and beyond from the March to August 2021 academic session, with a total sample size of 809 students.

Sampling Technique: Quota sampling, a type of non-probabilistic stratified sampling was used to select the samples (Quota sampling 2021). The selection of the participants was made from each of the university's seven faculties ranging from diploma and bachelor's degree study levels enrolling in semester 2 and higher, from March to August 2021 academic sessions.

Study Instrument: The study used an online questionnaire to gather information on socio-demographic and academic characteristics, COVID-19-related factors, challenges in open and distance learning (ODL), and Generalized Anxiety Disorder-7 (GAD-7) (Spitzer et al., 2006).

Data Collection: The collection of data was made through the online survey conducted via Google Docs Form from August 13 to September 12, 2021. Students who were the participants of the study received the online survey through messages in the WhatsApp application. During this period, most students were continuing their ODL at their parents' homes.

Data Analysis: Statistical Package for Social Sciences (SPSS) Version 26.0 was used in analyzing the data. To illustrate the anxiety level among Bumiputera students, descriptive statistics were analyzed. In determining the presence of any significant disparities between socio-demographic, academic and psychosocial characteristics, ODL challenges, and COVID-19-related factors and anxiety levels during the COVID-19 pandemic, the study utilized an independent-sample t-test and one-way analysis of variance (ANOVA). Then, to evaluate the most contributing risk and protective factors against anxiety among Bumiputera students, statistically significant variables were included in multinomial logistic regression analysis. The strengths of association estimates were shown by the odds ratio (OR) with a 95% confidence interval (CI). The odds ratio is the change in odds of being in one of the categories of outcome when the value of a predictor increases by one unit (Tabachnick & Fidell, 2014). The value of OR can be either equal to 1, less than 1, or more than 1. If OR = 1, the predictor does not affect the odds of outcome, if OR > 1 predictor is associated with higher odds of outcome, and if OR < 1 predictor is associated with lower odds of outcome (Szumilas, 2010). The study reported significant results where the p-value was less than 0.10.

4. Results

Participants' Demographic Analysis: 811 responses were received in this study altogether. Following the data cleaning, it was determined that 809 responses could be used in the study. Table 1 depicts the participants' socio-demographic and academic characteristics.

Table 1: Socio-Demographic and Academic Characteristics of the Participants

Socio-demographic and Academic Characteristics	Categories	Frequency	Percent
Gender	Male	191	23.6
	Female	618	76.4
Age	Below 20 years	251	31.0
	20 years and above	558	69.0
Staying with	**Alone/With friends**	16	2.0
	Family	793	98.0
Family residence	**Rural**	292	36.1
	Urban	517	63.9
Family monthly income	Less or equal to RM4,850 (B40)	490	60.6
	RM4,851 or equal to RM10,970 (M40)	228	28.2
	RM10,971 or above (T20)	91	11.2
Family residence state region	**Northern**	101	12.8
	Central	412	52.4
	Southern	200	25.4
	East Coast	55	7.0
	East Malaysia	18	2.3
Field of study	Language studies	76	9.4
	Communication and media studies	160	19.8
	Hotel management	69	8.5
	Business and management studies	195	24.1
	Accounting	102	12.6
	Computer sciences	86	10.6
	Art and design	121	15.0

Level of study	**Diploma**	596	73.7
	Bachelor degree	213	26.3
Current semester status	**Non-graduating**	731	90.4
	Graduating	78	9.6
Previous education qualification	**Sijil Pelajaran Malaysia (SPM)**	576	71.2
	Sijil Tinggi Pelajaran Malaysia (STPM)	53	6.6
	Matriculation/Foundation	47	5.8
	Diploma	133	16.4

Anxiety Levels of Bumiputera Students at Public University: The anxiety levels of students were measured through the Generalized Anxiety Disorder-7 (GAD-7) scale (Spitzer et al., 2006). This GAD-7 comprises a number of 7 items, each rated on a 4-point ordinal scale: 0 (not at all), 1 (several days), 2 (more than half the days), and 3 (nearly every day). The score range of the responses given to the sum of the items was from 0 to 21, categorizing anxiety levels as follows: 0-4 (none to minimal anxiety), 5-9 (mild anxiety), 10-14 (moderate anxiety), and 15-21 (severe anxiety) (Spitzer et al., 2006). The seven items' internal consistency was reported as high, with 0.916 as the Cronbach's alpha value, indicating excellent reliability within the sample. Table 2 illustrates the distribution of anxiety levels among Bumiputera students at the university. According to the total of GAD-7 anxiety, 24.4% had none to minimal anxiety, 31% had mild anxiety, 23.7% faced moderate anxiety, and 20.9% reported experiencing severe anxiety. With 8 or higher as the score as a cutoff for identifying probable cases of generalized anxiety disorder, it was found that 55.6% of students experienced such anxiety during the period of the pandemic. The sum of average anxiety was 9.28, which indicated a mild anxiety of the 0 to 21 range of level.

Table 2: Descriptive Statistics of Students' Anxiety Levels

Anxiety Score Sum	Anxiety Level	Frequency	Percent	Anxiety Score Mean	Std. Deviation (SD)
0 – 4	None to minimal	197	24.4	2.23	1.506
5 – 9	Mild	251	31.0	7.01	1.342
10 – 14	Moderate	192	23.7	11.87	1.410
15 – 21	Severe	169	20.9	17.95	2.191
Total		809	100.0	9.28	5.797

Difference between Academic Performance and Anxiety: Students were also required to give a response to the question; "What do you notice about your overall previous attained academic performance after going through open and distance learning (ODL) for two to three semesters during the Covid-19 pandemic?" From 809 students, the majority (46.7%) responded there were both improvements and drops, 25.2% responded there were improvements, 14.8% responded there were drops in their grades, and 13.2% responded there were no changes in their overall previous attained academic performance. Table 3 reveals that of 120 students who responded there were drops in their overall previously attained academic performance, 25.8% reported experiencing severe anxiety, 24.2% with moderate anxiety, and 50% experienced minimal to mild anxiety.

Table 3: Difference in Students' Anxiety with Respect to Overall previously attained Academic Performance

Overall Previous Attained Academic Performance	N	%	Anxiety Level								Anxiety Score		F	Sig
			Minimal		Mild		Moderate		Severe					
			n	%	n	%	n	%	n	%	Mean	SD		
No changes	107	13.2	30	28.0	37	34.6	20	18.7	20	18.7	8.42	5.628		
Increase	204	25.2	68	33.3	57	27.9	41	20.1	38	18.6	8.51	6.123		
Both increase and decrease	378	46.7	79	20.9	117	31.0	102	27.0	80	21.2	9.61	5.607	3.717*	0.011
Decrease	120	14.8	20	16.7	40	33.3	29	24.2	31	25.8	10.33	5.769		

*Significant at 0.05 level

In answering Research Question 1, the study conducted a One-way analysis of variance (ANOVA). A statistically significant difference in anxiety scores was found in overall previous attained academic performance ($F(3, 805) = 3.717$, $p < 0.05$). Based on post-hoc comparisons using Turkey HSD test, the decrease group's mean score (mean = 10.33, SD = 5.769) was indicated as significantly different in comparison to the increase group (mean = 8.51, SD = 6.123) and no changes group (mean = 8.42, SD 5.628) but insignificant difference from both increase and decrease group (mean = 9.61, SD = 5.607) as shown in Table 3. The result indicated that the drop in previously attained academic performance during the COVID-19 pandemic had significantly developed higher anxiety among students. The result revealed that students with a pass to average current CGPA 2.00 – 2.99 experienced the highest proportion of anxiety at moderate (27.9%) and severe (21.3%) levels in comparison to good (CGPA 3.00 – 3.74) and excellent (CGPA 3.75 – 4.00) performers. However, the result found that there was no significant difference in anxiety across current academic performance ($F(2, 806) = 0.399$, $p > 0.05$). This result indicated that students from different CGPA groups experienced approximately equal anxiety levels following the spread of COVID-19.

Difference Between Open and Distance (ODL) Learning Satisfaction and Anxiety: In answering Research Question 2, the study conducted an Independent-samples t-test. Overall online learning satisfaction was measured using 1 – dissatisfied and 2 – satisfied. The majority (85.2%) of the students showed that they were satisfied with open and distance learning (ODL) implemented by the university while 14.8% showed dissatisfaction towards ODL From 120 students who were dissatisfied with ODL, 27.5% experienced moderate anxiety and 36.7% experienced severe anxiety. Results showed that students who were dissatisfied (mean = 12.00, SD = 5.952) towards ODL had significantly ($t = 5.669$, $p < 0.001$) higher levels of anxiety compared to students who were satisfied (mean = 8.81, SD = 5.642) towards ODL as shown in Table 4. The result suggested that students who were dissatisfied with ODL had higher chances to develop moderate to severe anxiety. Pearson's correlation coefficient also showed a significant negative correlation between ODL satisfaction and anxiety ($r = -0.275$, $p < 0.001$) which concurred with the study by (Heckel & Ringeisen, 2019).

Table 4: Difference of Students' Anxiety Regarding ODL Satisfaction

ODL satisfaction	N	%	Anxiety level								Anxiety score		t	Sig
			Minimal		Mild		Moderate		Severe					
			n	%	n	%	n	%	N	%	Mean	SD		
Dissatisfied	120	14.8	14	11.7	29	24.2	33	27.5	44	36.7	12.00	5.952	5.669***	0.000
Satisfied	689	85.2	183	26.6	222	32.2	159	23.1	125	18.1	8.81	5.642		

Major Stressors of Anxiety of Bumiputera Students During the COVID-19 Pandemic: In identifying the determinants that contributed most towards the probability of anxiety among Bumiputera students, multivariate logistic regression analysis was carried out. The study only reported significant results where the p-value was less than 0.10. Of 24 significant determinants in bivariate analysis, only seven determinants contributed most to anxiety among Bumiputera students. Results found that the odds of being at a higher level of anxiety decreased (OR = 0.343 95% CI = 0.185 to 0.663) if the students were male. In other words, female students had more tendency to have anxiety levels that are higher as opposed to male students. This also means female students were more vulnerable to Covid-19 situations than male students. Furthermore, the odds of being at a higher level of anxiety increased by 6.2 times (95% CI = 2.089 to 18.534), increased by 5.2 times (95% CI = 2.050 to 13.021), and increased by 3.4 times (95% CI = 1.233 to 9.325) if the students pursued studies in language, communication and media, as well as hotel management in comparison to students pursuing other field of studies. Results also revealed that students who did not share laptops with family members (OR = 0.541 95% CI = 0.313 to 0.935), students who did not have problems to catch up with ODL courses (OR = 0.395 95% CI = 0.174 to 0.901), students who did not experience quarantine because of close contacts with positive Covid-19 individual (OR = 0.502 95% CI = 0.264 to 0.956), and students who did not experience depressive thoughts (OR = 0.469 95% CI = 0.208 to 1.056) were less likely to develop severe anxiety level as opposed to the students having experiences of such situation.

While it was 2.7 times (95% CI = 1.317 to 5.718) of the likeliness more likely for respondents who were dissatisfied with ODL to develop severe anxiety as opposed to those satisfied with ODL. Results indicated that the studies of language, communication and media, as well as hotel management, and dissatisfaction towards

ODL were considered risk factors for anxiety among Bumiputera students. While protective factors against anxiety identified were having a male as agender, having no laptop sharing with families, having no problems in catching up with online courses, no depressive thoughts experience, and no experience of having quarantine because of close contacts with positive COVID-19 individuals. A review study on quarantine by (Brooks et al., 2020) identified quarantine duration, fear of infection, frustration and boredom, and having insufficient basic supplies like food, water, clothes, or accommodation as stressors during the quarantine period, while stressors of post-quarantine were finances, and stigma from other people. All these stressors, if uncontrollable, might lead to severe anxiety levels. Table 5 shows the outcomes of multinomial logistic regression of factors that most influence students' severe anxiety levels.

Table 5: Multinomial Logistic Regression of Most Influential Factors of Students' Severe Anxiety Levels

Variables	Categories	B	Std. Error	Sig.	Exp(B)	95% Confidence Interval (CI) for Exp(B)	
						Lower Bound	Upper Bound
Gender	Male	-1.071	0.313	0.001	0.343***	0.185	0.633
	Female	0[b]	.	.	.	.	.
Region of living residence	Northern	-1.010	0.862	0.241	0.364	0.067	1.972
	Central	-0.538	0.814	0.509	0.584	0.118	2.880
	Southern	-0.772	0.841	0.359	0.462	0.089	2.403
	East Coast	-0.966	0.947	0.308	0.381	0.060	2.436
	East Malaysia	0[b]	.	.	.	.	.
Field of study	Language	1.828	0.557	0.001	6.222***	2.089	18.534
	Communication and media studies	1.642	0.472	0.000	5.167***	2.050	13.021
	Business management studies	0.392	0.432	0.365	1.480	0.634	3.455
	Hotel management	1.221	0.516	0.018	3.390*	1.233	9.325
	Accounting	0.625	0.489	0.201	1.869	0.717	4.874
	Computer science	0.893	0.543	0.100	2.443	0.842	7.087
	Art and design	0[b]	.	.	.	.	.
Current semester	Non-graduating	-0.198	0.437	0.651	0.821	0.348	1.933
	Graduating	0[b]	.	.	.	.	.
Unstable internet	No	-0.145	0.344	0.673	0.865	0.441	1.696
	Yes	0[b]	.	.	.	.	.
Overload of assignments	No	-1.209	0.851	0.155	0.298	0.056	1.581
	Yes	0[b]	.	.	.	.	.
Delay of assignment submission due to Internet access	No	0.858	0.505	0.090	2.357	0.876	6.347
	Yes	0[b]					
Laptop sharing with other family member	No	-0.614	0.279	0.028	0.541*	0.313	0.935
	Yes	0[b]	.	.	.	.	.
Computer crash	No	-0.471	0.354	0.183	0.625	0.312	1.249
	Yes	0[b]	.	.	.	.	.
Computer competency	No	-0.183	0.350	0.601	0.833	0.419	1.654
	Yes	0[b]	.	.	.	.	.
Insufficient preparation for ODL	No	0.038	0.434	0.930	1.039	0.443	2.433
	Yes	0[b]	.	.	.	.	.
Problems catching up with online courses	No	-0.928	0.420	0.027	0.395*	0.174	0.901
	Yes	0[b]	.	.	.	.	.
Difficult covering difficult online courses	No	-0.424	0.743	0.568	0.654	0.152	2.808
	Yes	0[b]	.	.	.	.	.
Non-conducive environment for ODL	No	0.201	0.309	0.515	1.223	0.668	2.239
	Yes	0[b]	.	.	.	.	.
Financial difficulties	No	-0.344	0.273	0.208	0.709	0.416	1.210

Variables	Categories	B	Std. Error	Sig.	Exp(B)	95% Confidence Interval (CI) for Exp(B) Lower Bound	Upper Bound
	Yes	0[b]	.	.	.	.	.
Family commitment	No	0.136	0.339	0.688	1.146	0.589	2.229
	Yes	0[b]	.	.	.	.	.
Worried about academic progress and future career	No	0.062	1.197	0.958	1.064	0.102	11.120
	Yes	0[b]	.	.	.	.	.
The barrier to interaction with lecturers	No	-0.774	0.505	0.126	0.461	0.171	1.243
	Yes	0[b]	.	.	.	.	.
Decreased social interaction	No	-0.385	0.453	0.395	0.680	0.280	1.654
	Yes	0[b]	.	.	.	.	.
Depressive thoughts	No	-0.757	0.414	0.068	0.469[+]	0.208	1.056
	Yes	0[b]	.	.	.	.	.
Being quarantined due to close contact with a positive Covid-19 individual	No	-0.688	0.328	0.036	0.502*	0.264	0.956
	Yes	0[b]	.	.	.	.	.
Parents/family members/relatives infected with COVID-19	No	-0.109	0.259	0.672	0.896	0.540	1.488
	Yes	0[b]	.	.	.	.	.
Having sleep problem	No	-0.830	0.587	0.157	0.436	0.138	1.378
	Yes	0[b]	.	.	.	.	.
Overall ODL satisfaction	Dissatisfied	1.010	0.374	0.007	2.745**	1.317	5.718
	Satisfied	0[b]	.	.	.	.	.

*[+] Significant at 0.1 level *Significant at 0.05 level **Significant at 0.01 level ***Significant at 0.001 level 0[b] – reference*

Discussion

The study identified some protective and risk factors for severe anxiety among Bumiputera students during the COVID-19 pandemic in Malaysia. The mental well-being of vulnerable groups of individuals such as students who were infected with COVID-19 should be supported as they are the group that is more likely to develop severe anxiety levels that may affect their learning experiences and hence their academic performance. From analysis using the Chi-square test, it was shown that 78.8% of students staying in rural areas and 71.2% staying in urban areas experienced internet instability in their places of stay and the two variables showed a significant association (Chi-square = 5.572, $p < 0.05$). Moreover, during the MCO periods, students were taking online classes, therefore, a stable internet connection would help students to focus on their learning without thinking much about COVID-19 and hence would lessen their anxiety levels. With a stable internet connection, students can also release the stress during COVID-19 pandemic by watching YouTube or Netflix and this could reduce or control their anxiety levels. From this present study, most students (93.9%) who had to share laptops experienced computer crashes during unexpected moments. Students who shared laptops would not focus on their online learning compared to those owning laptops.

The present study found that 94.9% of students who shared laptops also had difficulty concentrating on what they were doing. Also, a significant connection between sharing laptops and difficulty in concentration was discovered (Chi-square = 28.989, $p < 0.001$). Moreover, those owning laptops were free to do what they wanted with their laptops and how long they wanted to use the laptops. However, if students were sharing laptops, their computer usage time was limited and hindered them from doing what they were supposed to, and this would ultimately increase their anxiety level. Both laptop sharing and computer crashes would develop anxiety and stress among students especially when they had a piling of assignments to be completed and submitted. Sufficient computer/internet competency and preparation were needed for ODL especially when some technical problems cropped up before or during ODL sessions. Students could not concentrate on what they

were learning, which caused them to become annoyed or irritable with the situation which could end up in increased anxiety levels. Problems in catching up with tough online courses and struggling to cover difficult online courses were prevalent among less performed students which would cause increased anxiety levels among them. These situations would lead to becoming nervous, anxious, and uncontrollable of worry which ended in an increased level of anxiety.

From (Ismail et al., 2020), restlessness in a non-conducive environment was reported to prevent students from engaging in online learning sessions. The present study found that most (74.3%) students with non-conducive learning environments came from B40 income family backgrounds which agrees with (Ismail et al., 2020). In the current study, 95% of students experiencing non-conducive environments for their ODL also had difficulty in concentration. Further analysis showed that there was a significant association (Chi-square = 121.896, $p < 0.001$) between the non-conducive environment for ODL and difficulty in concentration. Almost 95% of students expressed that they were stressed with overwhelming assignments. These piling assignments with no flexible deadlines might make them fail to stop or control from feeling worried which leads to more anxiety. Approximately, 88% of students expressed that due to piling assignments, they had difficulty in concentrating on what they were doing, which ultimately increased their anxiety levels. In investigating the most contributing determinants to severe anxiety levels, multinomial logistic regression was utilized. Severe anxiety was prominent among female students. Females were generally more emotional and sensitive than males, and the situation might have worsened during the COVID-19 pandemic. Of 618 female students, only 3.2% sought help from mental health services provided by the university and 27.7% of females did not seek help.

Further analysis found a significant link between gender and coping strategy by seeking help from mental health services (Chi-square = 7.659, $p < 0.05$). Moreover, female students were subjected to having fewer coping strategies in uncertainties and tough situations (Sundarasen et al., 2020). In this study, older students (20 years and above) were found to possess higher levels of anxiety as opposed to younger students (18 to 19 years). However, the study found the anxiety levels for the younger and older students did not differ significantly which is similar to studies by (Chaudhary et al., 2021). For academic characteristics, only the study fields showed some significance in severe anxiety levels. It was demonstrated that students who pursued studies in language, communication and media, as well as hotel management appeared to have higher anxiety levels. The result approximately aligns with (Sundarasen et al., 2020), which concludes that students from management-related studies experience greater anxiety in times of pandemics. In terms of ODL challenges, the most contributing stressors to higher anxiety levels were laptop sharing with other family members and problems in catching up with tough online courses. There were still Bumiputera students in the university who did not own laptops. This would hinder them from doing important matters such as completing their assignments on time. Unable to complete the assignments on time would create some kind of pressure on some students which could increase anxiety.

Problems in catching up with online courses were very common among students during online classes, especially with difficult courses. Lecturers should have effective strategies to overcome this problem. In addition, dissatisfaction with ODL could also develop anxiety among students. Regarding psychosocial characteristics, the only potential stressor for higher levels of anxiety was depressive thoughts. From the study, almost 84% of students experienced depressive thoughts such as loneliness, feeling powerlessness or hopelessness, and feeling uncertain or insecure about the future. Those having depressive thoughts had more tendency to develop severe anxiety in comparison to students with no such thoughts. The result revealed that a higher proportion of students experienced mild to severe anxieties if they had interaction barriers with lecturers, lessened social interaction, along depressive thoughts. Many students had been going through these difficult times; unprecedented happenings due to Covid-19 and lockdowns and adjustment to ODL. Lecturers have to realize and understand the difficult situations faced by their students by giving them support, motivation, and advice which would make them happy and could lessen their worry and ultimately lessen their anxiety levels. Support, motivation, and advice from lecturers would also act as social support to cope with students' anxieties.

During the continuous Covid-19 pandemic and MCO periods, social interaction had to be reduced. From the study, approximately 88% of students responded that they experienced reduced social interaction. With reduced social interaction, students felt isolated from their friends which created a feeling of restless at home,

unhappy, frustrated, and undue resentment which ultimately increased their anxiety level. In this study, the study fields of language, communication and media, as well as hotel management and dissatisfaction towards ODL were identified as major risk factors for anxiety while having a male gender, no laptop sharing with family members, no problems in catching up with tough online courses, no depressive thoughts experience, no quarantine experience were viewed as protective factors against anxiety. The investigation uncovered that merely 30.5% of the students were aware of the mental health support services available that the university offers. Nonetheless, 14% actively looked for the service's assistance. It was demonstrated from the current study that those who were informed and looked for help had lower anxiety levels compared to those who were aware.

But did not seek assistance and those who were unaware or uncertain about the university's mental health support services. Treatment for anxiety may involve medication, counseling, therapy, or a combination of these interventions. Based on these findings, there is a critical need for the university to ensure the awareness of students in knowing about mental health support services, and encourage students to seek treatment, therapy, or counseling from these services. Taking proactive measures by the university is essential to prevent the deterioration of students' mental health, which could adversely impact their learning experiences and ultimately disrupt their academic performance. The university must provide comprehensive support for mental health, encompassing psychiatric and psychology-based services. Additionally, financial assistance from the government is essential so there will be effective mental health support services while consistently monitoring students' mental health. The study also revealed that students who experienced a decline for one to two semesters academically during the COVID-19 pandemic period exhibited greater anxiety in comparison to students who had inclining or stable academic performance.

5. Conclusion, Recommendations and Future Research

A significant 76% of Bumiputera students at a public university reported experiencing anxiety during the period of the COVID-19 pandemic and Movement Control Order (MCO), exacerbated by such challenges of online distance learning (ODL). Various stressors such as being female, sharing laptops with family members, struggling with tough online courses, experience in quarantine, and depressive thoughts were identified as factors contributing to severe anxiety among Bumiputera students. Enrollment in the studies of language, communication and media, as well as hotel management, along with dissatisfaction with ODL, were recognized as risk factors associated with anxiety. Furthermore, a noteworthy association was found between decreased academic performance and anxiety symptom levels of Bumiputera students. These findings underscore the significant impact that the pandemic crisis has on university students' mental health, emphasizing the need for support from communities, families, and universities during this emergency period. To address these challenges, efficient and effective pedagogical strategies for online courses are essential, as highlighted by Saadé et al. (2017). The recommendation for a laptop loan scheme, particularly for students from B40 families without personal laptops, is strongly endorsed. Collaboration between the Higher Education Ministry and universities is crucial in strengthening mental health support services and equipping university clinics with public health facilities.

Improvements in the Learning Management System, tailored to be more user-friendly, are essential for students, lecturers as well as non-academic staff. It is suggested for lecturers to enhance strategies for online teaching, especially with regard to students facing difficulties with challenging course topics and facilitate interactive and collaborative online learning activities to improve interaction. Chandrasiri & Weerakoon (2021) in their study emphasize the need for the delivery of interactive online learning sessions via smartphone. In online education, there should be a shift in terms of the delivery of content, assessments, and communication as noted by Junus et al. (2021). Students should be offered long-term intervention and supportive programs in which enhancement of self-esteem and self-efficacy is the focus, extending past the ongoing pandemic, following the insights of Germani et al. (2020). Training sessions for lecturers and students in the application and accessibility of technology are critical to maximizing the benefits of online education by improving computer and internet competency. Future research endeavors should encompass a broader spectrum of students from diverse ethnic backgrounds in both public and private universities, exploring additional stressors related to anxiety and addressing a more comprehensive array of mental health issues in the post-COVID-19 period.

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Exploring the Usability and Engagement of Students in an Educational Board Game on Personal Financial Planning

Idris Osman, Norraeffa Md Taib, Zarinah Abu Yazid, Shahreena Daud, Mohd Zailani Othman
Faculty of Business & Management, Universiti Teknologi MARA, Cawangan Melaka Kampus Bandaraya Melaka, Malaysia
idris424@uitm.edu.my, norraeffa@uitm.edu.my*, zarinah320@uitm.edu.my, shahreena868@uitm.edu.my, mzothman@uitm.edu.my

Abstract: Traditional teaching approaches lack engagement, personalization, flexibility, and effective evaluation, thereby limiting learning outcomes. Consequently, these systems face challenges in engaging students, meeting their individual needs, adapting to diverse learning situations, and accurately assessing their competency. Educational board games (EBGs) offer a dynamic and engaging learning experience through play and personalized learning, promising optimal outcomes to overcome these obstacles. The objective of this study is to investigate how usability influences student engagement using the MEEGA+ evaluation approach during EBG play in a Personal Financial Planning course at Universiti Teknologi MARA (UiTM) Cawangan Melaka, Kampus Bandaraya Melaka. This quantitative study involved a self-administered questionnaire and a purposive sample of 200 bachelor's degree students in the course. PLS-SEM was utilized to assess the model and hypothesized relationships. The operability and accessibility of educational games significantly enhanced student engagement, underscoring the utility of board games for learning through play. Usability, experience, and engagement should be integral considerations in instructional game design. The MEEGA+ assessment model can be applied to evaluate game-based learning across various EBGs. Board games have the potential to enhance educational outcomes, underscoring the necessity for further research in game-based learning. The study also suggests that the MEEGA assessment model can assist designers and educators in developing effective game-based learning experiences.

Keywords: *Usability, Student engagement, MEEGA+ assessment model, educational board game.*

1. Introduction

For a prolonged period, education has heavily relied on conventional instructional methods, characterized by lengthy lectures and an emphasis on rote memorization (Onofrei & Ferry, 2020; Wong, 2018). Critics argue that these methods often fall short of enhancing students' learning outcomes, particularly in sustaining their attention (Martin & Martinez, 2016). While some students thrive in lecture-centric environments, others struggle without opportunities for discussion and individualized attention (Byusa, Kampire & Mwesigye, 2022; Platz, 2022). Studies by Begy (2017) and Ghazal, Al-Samarraie, and Wright (2020) indicate that student's express dissatisfaction with their learning outcomes and report lower levels of individualized attention under traditional instructional methods. Moreover, these approaches are frequently inflexible and fail to adapt to diverse situations or student groups (Onofrei & Ferry, 2020; Wong, 2018), diminishing their effectiveness in today's varied and ever-changing classrooms. Barbara (2019) and Fjaellingsdal and Klockner (2020) discovered that integrating project-based learning and problem-solving activities with traditional methods enhances students' critical thinking, creativity, and teamwork, leading to a better understanding of the material. Recognizing these limitations, researchers and educators are actively seeking new teaching approaches that better align with the needs of contemporary students.

This shift has given rise to individualized lessons and interactive learning activities as potential strategies to enhance students' interest, motivation, and performance in the classroom. Educational board games (EBGs) have emerged as a topic of discussion, with proponents suggesting that they may offer more effective learning experiences compared to traditional methods (Barbara, 2019; Fjaellingsdal & Klockner, 2020). The educational objectives of EBGs focus on improving learning experiences and academic performance by fostering critical thinking, collaboration, active learning, and problem-solving skills (Martin and Martinez, 2016; Gibson and Douglas, 2013; Barbara, 2019). In recent years, educators have come to recognize EBGs as valuable teaching tools, in addition to their historical popularity as forms of entertainment and social interaction (Fjaellingsdal & Klockner, 2020; Hoy, 2018). Unlike traditional educational methods such as reading or listening, EBGs actively involve players in the learning process. The dynamic and engaging nature of gaming transforms learning into

a fun, relevant, and memorable experience. Within the framework of the game, students actively participate in decision-making, problem-solving, and critical thinking, promoting an environment of active learning (Barbara, 2019; Begy, 2017; Fjaellingsdal & Klockner, 2020).

Despite the acknowledged advantages of facilitating various learning contexts of usability (Gibson & Douglas, 2013; Wong, 2018), a critical examination of EBGs is essential. The primary objective of this study is to investigate the influence of students' usability on engagement when implementing an EBG within the context of a Personal Financial Planning course. Petri, Von Wangenheim, and Borgatto (2016; 2017) utilized the MEEGA+ evaluation methodology to collect data on how effectively the EBG was used and its impact on student involvement. The results of this study aim to contribute to existing knowledge on educational game design and shed light on successful strategies for integrating EBGs into lesson plans. Ultimately, the study aspires to provide teachers and instructional designers with valuable insights to enhance the use of EBGs in the Personal Financial Planning course, leading to improved learning outcomes and a more engaging class overall. This study employed the MEEGA+ evaluation model to examine the influence of usability on student engagement in the context of implementing an EBG for a Personal Financial Planning course. The exploration begins by reviewing existing literature on EBGs and their potential to enhance student engagement. Following a summary of the study objectives and research methods employed, the results are presented and analyzed. The conclusion section of the paper reflects on the implications of the study for the utilization of EBGs and evaluates potential recommendations for further research.

2. Literature Review

The origins of teaching and learning can be traced back to ancient civilizations, where oral practices and apprenticeships served as the primary modes of education. These early methods laid the foundation for the more structured approaches to teaching and learning prevalent today. As societies evolved and the demand for education increased, the establishment of organized learning environments such as schools and colleges became imperative (Onofrei & Ferry, 2020; Wong, 2018). Traditional teaching methods, such as lectures and rote memorization, have persisted in educational institutions globally for an extended period, owing to their ease of use and the ability to convey information efficiently to large audiences (Fjaellingsdal & Klockner, 2020; Hoy, 2018). Despite their widespread use, these methods have faced significant criticism for their perceived inability to effectively enhance learning outcomes. Previous studies suggest that traditional methods may diminish students' interest in learning, adversely impacting their overall educational experiences (Byusa, Kampire, & Mwesigye, 2022; Platz, 2022). The passive absorption of knowledge through lectures or repetitive memorization can hinder students from actively engaging in the learning process. Consequently, students may struggle to develop critical thinking skills, problem-solving abilities, and a deep understanding of the subject matter (Begy, 2017; Byusa et al., 2022). A lack of interest in conventional teaching methods has also been correlated with poor academic performance and limited knowledge retention. When information is presented passively, students may find it challenging to remember and apply what they have learned in real-life situations, leading to a loss of interest and motivation in the learning process (Fjaellingsdal & Klockner, 2020; Onofrei & Ferry, 2020).

In response to the changing landscape of education, educators have recognized the necessity to explore new teaching methods that better align with the diverse preferences and needs of students. Recently, alternative approaches to teaching and learning have gained attention for offering a fresh perspective on educational delivery and increasing student engagement. Notable features of these methods include the potential to address issues associated with conventional teaching approaches, often characterized by passive methods such as lectures. New tools, interactive learning activities, and personalized teaching strategies are creatively employed to create dynamic and engaging learning environments. These elements enable teachers to customize each student's learning experience, fostering engagement, critical thinking, and problem-solving skills (Ben Itzhak et al., 2023; Byusa et al., 2022; You, Omonib, Laisserc, McGowand, Wakasiakab, Macleane, & Chimwaz, 2022). EBGs have garnered attention as a promising method to teach and learn in innovative ways (Lavendera et al., 2019). Specifically designed to make learning enjoyable and interesting, EBGs align with educational goals while captivating students' interest. EBGs prove effective in increasing students' enthusiasm for learning, sustaining motivation, and facilitating more effective learning by seamlessly integrating elements of fun and education. In contrast to traditional teaching methods, EBGs provide students with opportunities to

apply their knowledge in real-world scenarios (Ben Itzhak et al., 2023; Byusa et al., 2022; You et al., 2022). Frequently, these games incorporate real-life obstacles, situations, and choices, allowing students to actively participate in the learning process. EBGs successfully blend entertainment and learning by embedding educational content and objectives into the gaming experience, thereby motivating students to learn, and fostering a genuine interest in the subject matter.

Model for the Evaluation of Educational Games (MEEGA+): The MEEGA+ pedagogical framework, developed by Petri, Von Wangenheim, and Borgatto (2016; 2017), highlights the significance of board games as potent tools for teaching and learning. An acronym for the "Model of Educational Experiences based on Games and Analysis," MEEGA+ acknowledges video games as platforms providing realistic learning experiences fostering cooperation, critical thinking, and problem-solving. Unlike conventional evaluation systems, MEEGA+ recognizes and harnesses the inherent features of games to enhance the learning process. This paradigm shift suggests that gaming can substantially improve comprehension and retention, turning educational experiences into more engaging and inspiring endeavors. Teachers can harness the attention-grabbing and inspirational characteristics of games by incorporating game-based learning activities, making education more enjoyable and interactive for students. The MEEGA+ evaluation model facilitates the assessment of game usability, ensuring successful and captivating learning experiences (Petri et al., 2016; 2017). According to MEEGA+, educators can employ motivation, user experience, usability, engagement, and pleasure to craft EBGs that are both engaging and enjoyable for students. Evaluating EBG usability allows instructors to enhance design and implementation, addressing game-related obstacles for students. This assessment identifies accessibility flaws or design features that may impede learning or cause frustration. By addressing these issues, educators can make games inclusive and accessible to all students, irrespective of their background or ability.

Usability and Student Engagement in EBGs: In the creation of EBGs, user usability significantly influences student engagement and learning outcomes. The MEEGA+ evaluation model, designed with user usability in mind, contributes to the creation of successful game-based learning experiences. This approach encompasses aesthetics, learnability, operability, and accessibility (Ben Itzhak et al., 2023; Petri et al., 2016; 2017). The visual design, graphics, and presentation of EBGs impact students' motivation, immersion, and understanding of the game material. Focusing on aesthetics enhances the user experience, making it more attractive and interesting. Learnability, another critical aspect of the MEEGA+ evaluation model, assesses how well students grasp game mechanics, rules, and goals. Clear tutorials or introductions are essential to help students quickly comprehend the game's purpose and rules, while intuitive and responsive game controls and navigation contribute to a seamless experience.

A simple interface and smooth gameplay are crucial for providing students with an enjoyable time. The MEEGA+ evaluation model places a premium on accessibility, ensuring that EBGs are accessible to students of all abilities and requirements. Inclusion features, such as alternative modes of interaction or adjustable difficulty levels, make the game more accessible to students with disabilities or special needs (Ben Itzhak et al., 2023; Petri et al., 2016; Petri, 2017). EBGs, being interactive, challenging, and enjoyable, have the potential to enhance student engagement in learning. Their competitive and cooperative nature promotes collaboration, socialization, and communication among students. Research indicates that students who engage in board games are more likely to perform well academically, displaying increased motivation to study, better retention of information, and the ability to apply knowledge in new situations. Additionally, critical thinking, problem-solving, and communication skills are fostered in actively engaged students.

Hypotheses Development: The MEEGA+ evaluation model establishes the significance of enhancing various learning outcomes within the framework of EBGs, encompassing student engagement, information retention, and problem-solving abilities (Ben Itzhak et al., 2023; Petri et al., 2016; Petri et al., 2017). This model delineates the primary determinants impacting efficacy and overall user experience, including visual aesthetics, learnability, usability, and accessibility. While existing research has explored the immediate advantages of EBGs in terms of student engagement, there remains a gap in studying the enduring impacts of sustained involvement. Current research on EBGs and engagement has been limited in scope, often focusing on specific demographics or populations, such as elementary school children. Thus, a comprehensive examination is warranted, exploring the impact of board games on engagement across diverse populations and subject areas.

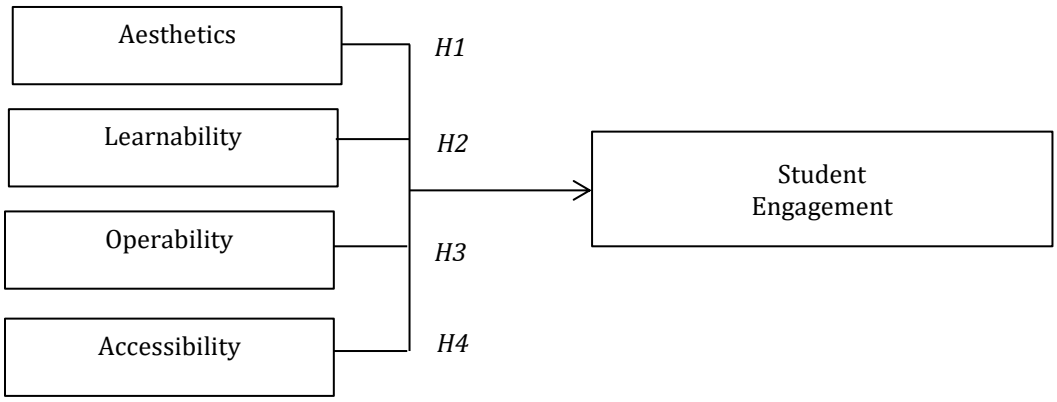
The usability of educational gaming platforms significantly influences students' use of EBGs for learning activities (Barbara, 2019; Begy, 2017; Ben Itzhak et al., 2023; Byusa et al., 2022; You et al., 2022). A user-friendly game enhances the learning experience, making students more interested and driven to study. Conversely, a complex game may lead to frustration and diminish enthusiasm, hindering the learning process. The visual aesthetics of a game play a crucial role in its appeal (Ben Itzhak et al., 2023; Petri et al., 2016; Petri et al., 2017). Engaging visuals enhance motivation and immersion in the learning process, while unappealing aesthetics may evoke negative emotions and reduce engagement.

Learnability, the capacity for students to grasp game mechanics, regulations, and objectives, is crucial for effective engagement (Ben Itzhak et al., 2023; Petri et al., 2016; Petri et al., 2017). A straightforward and comprehensible game promotes confidence and a desire to participate, while complexity may hinder engagement and lead to diminished learning outcomes. Operability, reflecting the ease with which pupils can utilize the game, influences the overall usefulness of players. User-friendly controls and accessibility enhance the gaming experience, fostering more engagement. Conversely, disorganized or complex controls may elicit frustration and impede effective engagement with the learning material.

Accessibility significantly impacts a player's performance (Ben Itzhak et al., 2023; Petri et al., 2016; Petri et al., 2017). To optimize the gaming experience, creating an EBG that accommodates a wide range of student profiles fosters inclusivity and ensures equal opportunities for all students. In contrast, inaccessible games hinder complete involvement and impede students' ability to benefit from the educational experience. To analyze the impact of usability on student engagement, the following hypotheses were developed:

a) H1: Aesthetics positively influence student engagement in playing EBG.
b) H2: Learnability positively influences student engagement in playing EBG.
c) H3: Operability positively influences student engagement in playing EBG.
d) H4: Accessibility positively influences student engagement in playing EBG.

Figure 1: Proposed Research Framework



3. Methodology

This study employed a quantitative approach to systematically gather data, utilizing established methods such as surveys, experiments, and observational studies. This methodology relies on accurate, unbiased, and quantitative data to examine hypotheses and formulate forecasts for a population, making it particularly useful for identifying causal connections or making predictions. The data collection involved questionnaires with multiple items, assessed using a five-point Likert scale, ranging from one ("strongly disagree") to five ("strongly agree"). Participants were current undergraduate students pursuing a bachelor's degree in the Personal Financial Planning course at the Faculty of Business and Management, UiTM Cawangan Melaka, Kampus Bandaraya Melaka. A purposive sampling strategy was employed, and data were collected from various programs, including Finance, Human Resource Management, International Business, Marketing, and Office Management. Out of 300 distributed questionnaires, 200 (66.67 percent) yielded completed responses for further data analysis.

The questionnaire comprised three components. Firstly, participants responded to demographic inquiries. Subsequently, they answered questions related to usability components, including aesthetics, learnability, operability, and accessibility. Lastly, participants provided information on the student engagement variable. The survey questions were adapted from Petri et al. (2016) to assess the quality of educational games in terms of usability and student engagement. Ten items were used to assess usability, covering four main components: aesthetics (two items), learnability (three items), operability (two items), and accessibility (three items). Items measuring student engagement were derived from the study conducted by Maroco, Maroco, Campos, and Fredricks (2016). The study evaluated hypotheses using Partial Least Square Structural Equation Modelling (PLS-SEM) and Smart PLS 3.2.8 software.

Social science researchers employ PLS-SEM to predict theoretical frameworks. SEM, specifically PLS-SEM, is ideal for predicting and analyzing causal links between observable and unobserved variables. Its ability to handle complex models with many variables and connections, non-normal data, and small sample sizes makes it popular (Hair, Hult, Ringle, & Sarstedt, 2017). The weighted averages of observable data were used to depict latent variables in this investigation. A two-step PLS-SEM technique, involving verification of the measurement and structural models, was conducted using a sample of respondents. This validation process ensured the quality of empirical work, assessing internal consistency, indicator reliability, convergent validity, discriminant validity, and multicollinearity. The PLS-SEM structural model's explanatory and predictive capacity was evaluated using the coefficient of determination, effect size, path coefficients, predictive relevance, and relative impact.

4. Results

The investigation commenced with the utilization of IBM SPSS Version 29 for the initial phase of data analysis, followed by the implementation of Smart-PLS software. The dataset comprised 200 surveys, and a meticulous analysis revealed no missing values, indicating that respondents had answered all the questions. The demographic composition of respondents showed that 69.0 percent were female, while 31.0 percent were male. Regarding academic programs, the majority (60.0 percent) were enrolled in the Finance program. Additionally, 18.5 percent were pursuing studies in Marketing, 17.5 percent in Human Resource Management, and a small percentage of 2.0 percent focused on International Business and Office Management. Table 1 presents a detailed analysis of the participants' demographic data.

Table 1: Demographic Data (n=200)

Items	Frequency	Percent
Gender		
Male	62	31.0
Female	138	69.0
Ethnicity		
Malay	100	100
Sabah	0	0
Sarawak	0	0
Academic Programs		
Finance	120	60.0
Human Resource Management	35	17.5
International Business	4	2.0
Marketing	37	18.5
Office Management	4	2.0

Confirmatory factor analysis was employed to assess item reliability, convergent validity, and discriminant validity. Hair et al. (2010) recommended testing loadings, composite reliability (CR), and average variance extracted (AVE) for convergent validity. In Table 2.0, all item loadings exceeded the acceptable 0.5 threshold. All constructs had CRs between 0.740 and 0.930, surpassing the 0.70 cut-off (Nunnally, 1978; Gefen, Straub, & Boudreau, 2000). The AVE values were also 0.5 or higher, supporting Bagozzi and Yi's (1988) recommendation. On average, latent variables explained almost half of the variation in observable measurement items (Fornell & Larcker, 1981).

Table 2: Convergent Validity of the Reflective Items in the Measurement Model

Constructs/Items	Loadings	CR[a]	AVE[b]
Aesthetics (AES)			
AES1	0.889	0.911	0.836
AES2	0.939		
Learnability (LEA)			
LEA1	0.496	0.799	0.583
LEA2	0.833		
LEA3	0.900		
Operability (OPE)			
OPE1	0.909	0.888	0.799
OPE2	0.879		
Accessibility (ACC)			
ACC1	0.77	0.930	0.817
ACC2	0.965		
ACC3	0.963		
Student Engagement (ENG)			
ENG1	0.635	0.740	0.243
ENG2	0.675		
ENG3	0.634		
ENG4	0.424		
ENG5	0.254		
ENG6	0.389		
ENG7	0.132		
ENG8	0.453		
ENG9	0.445		
ENG10	0.596		

Notes: Loadings = ≥0.708; AVE = ≥0.50; CR = ≥0.70 – 0.90 (Hair, Risher, Sarstedt & Ringle, 2019).

Component discriminant validity was assessed using the heterotrait-monotrait correlations (HTMT) criteria. Henseler, Ringle, and Sarstedt (2015) argued that the commonly used Fornell-Larcker criteria have limited sensitivity and may not reveal discriminant validity concerns as well as the HTMT criterion. Inter-construct correlations did not surpass 0.90 in Table 3.0, indicating that none met the HTMT.90 criteria, thus showing no discriminant validity.

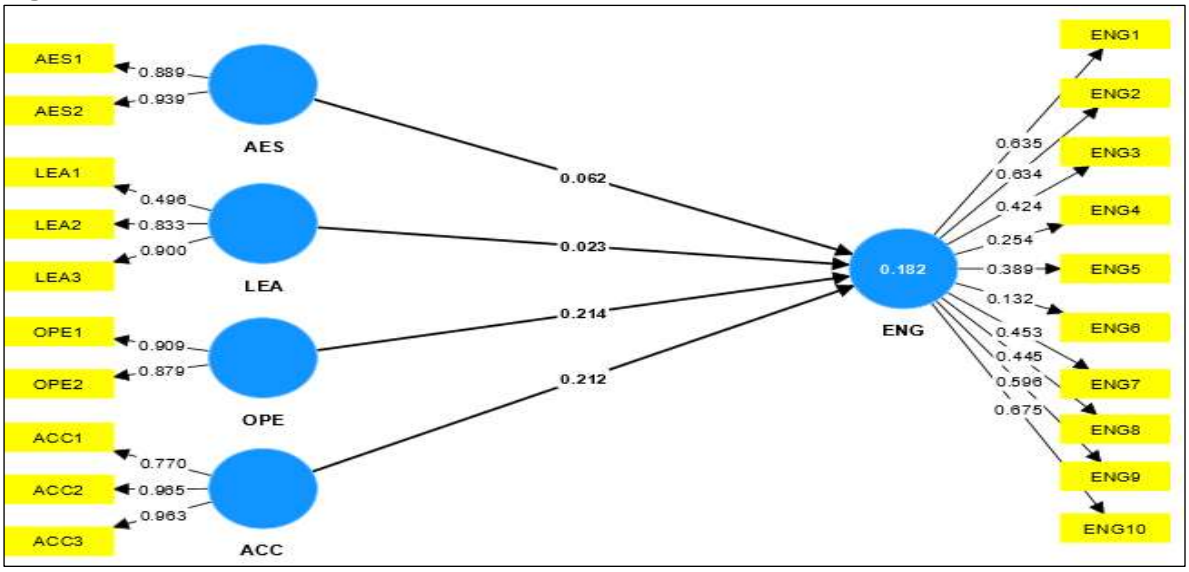
Table 3: Heterotrait-monotrait Correlations (HTMT) Criterion

Construct	ACC	AES	ENG	LEA	OPE
ACC					
AES	0.678				
ENG	0.447	0.371			
LEA	0.573	0.631	0.445		
OPE	0.652	0.54	0.503	0.981	

Notes: HTMT < 0.85 (Hair et al., 2015; Hair et al., 2019).

SPSS (version 29) and Smart PLS (version 4.0) were employed for PLS-SEM to maximize the explained variance of dependent latent variables (Hair, Black, Babin, & Anderson, 2010). As described in the preceding chapter, the measurement model was tested for internal consistency, indicator, convergent, and discriminant validity. Hair, Sarstedt, and Ringle (2012) used PLS-SEM to test the study's assumptions in two stages: the measurement model and the structural model. Bootstrapping was employed to test path coefficients and data. The non-parametric technique employed repeated random sampling to generate route connection data for hypothesis testing and standard error identification (Hair et al., 2010). Figure 2.0 depicts the measuring model and framework.

Figure 2: Measurement Model

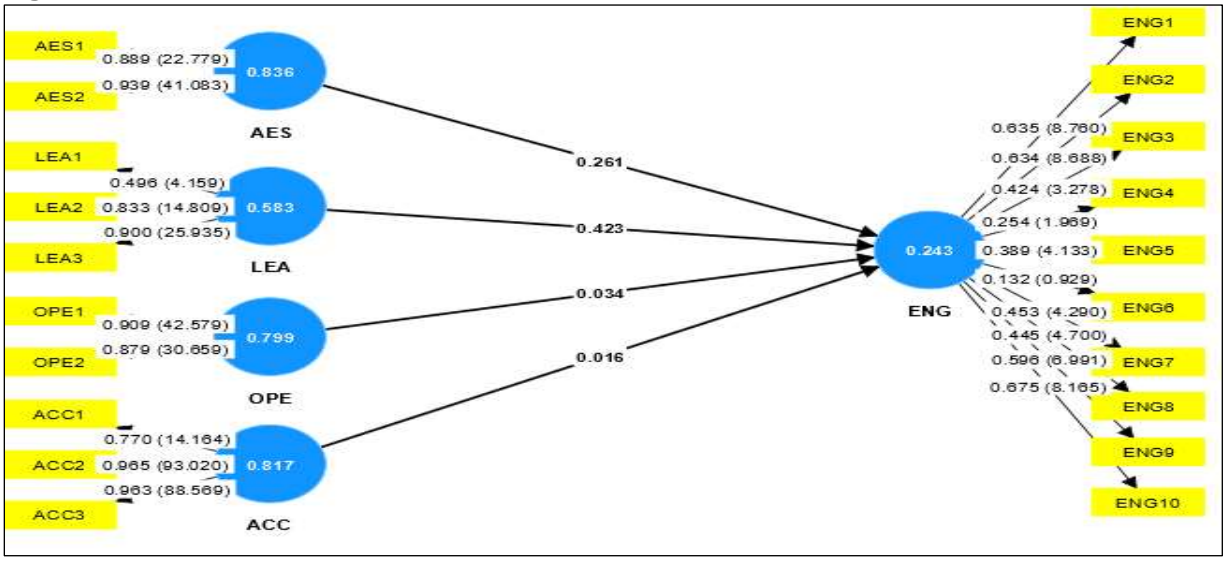


Hypotheses Testing: The first hypothesis (H1) links aesthetics to student engagement in EBG. The study found no significant relationship between aesthetics and student involvement (β=0.062, t=0.64, p-value=0.261). Thus, H1 is not supported. The second hypothesis (H2) indicates a relationship between student engagement in EBG and learnability (β=0.023, t=0.195, p-value=0.423). Therefore, H2 is statistically not supported. The third hypothesis (H3) suggests a link between operability and student engagement in EBG (β=0.214, t=1.84, p-value=0.034). Thus, H3 is significantly supported. The fourth hypothesis (H4) indicates a significant relationship between accessibility and student engagement in EBG (β=0.212, t=2.154, p-value=0.016). H4 is significantly supported. Given that both outcome variables were statistically significant, the model summary findings were statistically significant. It is possible to explain the 24.3 percent variation in student engagement, which has an R-square value of 0.243. For the model, a p-value of less than 0.05 means at least one of the hypotheses is supported (Hair et al., 2017; Henseler et al., 2015).

Table 4: Path Coefficient and Hypotheses Testing

Hypotheses	Relationships	t-Value	p-Value	Decisions
H1	Aesthetics (AES) → Student Engagement (ENG)	0.640	0.261	Not Supported
H2	Learnability (LEA) → Student Engagement (ENG)	0.195	0.423	Not Supported
H3	Operability (OPE) → Student Engagement (ENG)	1.840	0.034	Supported
H4	Accessibility (ACC) → Student Engagement (ENG)	2.154	0.016	Supported

Figure 3: Structural Model



5. Conclusion and Recommendations

The results of this study provide valuable insights into the relationship between usability components and student engagement in EBG. The evidence indicates that operability and accessibility significantly impact student engagement, but aesthetics and learnability have less influence. Operability, which refers to the degree of ease with which students can navigate and interact with the game, has been recognized as a critical factor that affects student engagement in gaming (Ben Itzhak et al., 2023; Petri et al., 2016; Petri et al., 2017). EBGs that have intuitive controls and seamless navigation augment students' capacity to interact with the game and maintain their interest throughout the duration of play. Effortlessly and easily maneuvering through the game improves the user's experience, hence increasing student engagement and interest in the learning activity. Moreover, the importance of accessibility in EBG was acknowledged as a crucial aspect influencing student engagement. When a game is accessible to all students, regardless of their talents or limits, it promotes inclusion and guarantees fair engagement (Barbara, 2019; Ben Itzhak et al., 2023; Byusa et al., 2022; You et al., 2022). Students with easy and frequent access to the game are more likely to feel empowered and motivated to gain information. On the other hand, limited access to the game might lead people to feel excluded and hinder their active involvement, thus affecting their educational accomplishments.

This study demonstrated that aesthetics, pertaining to the visual allure and beauty of the game, did not have a noteworthy impact on student engagement. This conclusion is corroborated by prior research carried out by Ben Itzhak et al. (2023), Petri et al. (2016), and Petri et al. (2017). While aesthetics is often seen as an important aspect of user experience, research suggests that in the case of EBGs, factors such as operability and accessibility have a more pronounced effect on student involvement. These findings have practical implications for the design and development of EBGs. Enhancing the whole learning process may be achieved by giving priority to operability and accessibility in game design, hence facilitating more student engagement. Integrating simple controls, intuitive interfaces, and inclusive features might potentially boost student motivation, engagement, and knowledge retention. However, it is important to highlight that this study specifically focused on the impact of usability factors on student engagement in EBG. Further work is necessary to explore alternative attributes and contextual factors that may interact with usability and influence the outcomes of interaction. Moreover, conducting research on the long-term effects of consistent engagement and analyzing its impact on different demographics and academic disciplines would improve our thorough understanding of the relationship between usability, student engagement, and educational outcomes in board games. When assessing the findings, it is important to consider the existing limitations of the present study.

The initial sample for this study consisted only of undergraduate students who were presently enrolled in a certain course at a particular institution. The findings may possess restricted applicability to diverse student populations or educational contexts. The findings may not apply to different educational levels or diverse student populations with distinct characteristics and histories. Future inquiries should consider including a more diverse group of individuals to enhance the applicability of the findings. Moreover, the measuring tool used in this study relied on self-report measurements. Despite efforts to ensure the precision and reliability of the altered survey questions, self-report evaluations are vulnerable to potential biases such as social desirability bias or memory recall bias. Participants may display response bias by offering responses that they see as more favorable or struggle to accurately recall their experiences of involvement. Utilizing additional study approaches, such as observations or interviews, might enhance our understanding of student engagement in EBGs. Moreover, the use of a cross-sectional strategy in this study presents constraints on the ability to establish causal relationships between usability characteristics and student engagement. A static representation of data is insufficient to capture the dynamic nature of interaction and the multitude of changes that might happen over a period.

To get a more thorough understanding of the relationship between usability characteristics and student engagement, it would be beneficial to conduct further longitudinal studies that track engagement levels over an extended period. Furthermore, this study primarily focused on evaluating the usability elements, such as aesthetics, operability, accessibility, and learnability. While these criteria have been shown to significantly influence student engagement, it is important to acknowledge that other factors, such as game content, instructional design, and individual student characteristics, may also play a role. To get a more comprehensive understanding of the factors that impact student engagement in EBGs, next research should investigate a

broader range of variables. Ultimately, the study was conducted inside a controlled setting, perhaps limiting the applicability of the findings to a broader context. The artificial nature of the study environment and the specific conditions under which the games were played could not accurately capture the complexities and nuances of real-world educational settings. When assessing the outcomes, it is essential to consider the practical constraints and contextual factors that might affect student engagement in actual educational environments.

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The Impact of Stock Market Development on Economic Growth a Case of Malaysia

Khairunnisa Zulkifli[1], Sharulshahida Shakrein Safian[2*], Razida Hanem Mohd Radzil[3], Norhasimah Shaharuddin[2]
[1]Universiti Teknologi MARA, Shah Alam, Selangor, Malaysia
[2]Faculty of Business and Management, Universiti Teknologi MARA, Puncak Alam, Selangor, Malaysia
[3]Faculty of Business and Management, Universiti Teknologi MARA, Raub, Pahang, Malasia
khairunnisa.zrs@gmail.com, *sharulshahida@uitm.edu.my, razida@uitm.edu.my, shimasaha@uitm.edu.my

Abstract: The stock market is important among many financial markets. Stock Market Development is one of the enabling factors for Economic Growth. The recession crisis occurred a few times and badly affected Malaysia's Economic Growth (GDP) and Stock Market Development (SMD). Also, during the recent pandemic of COVID-19, there was a different reaction by investors and individuals overall towards the economy in Malaysia. There were inconsistent trends when the global recession in 2008 happened and COVID-19 started to spread in Malaysia for both SMD and GDP. This study aims to determine the relationship between SMD and GDP in Malaysia. Using Market Capitalization (MCAP) (as a proxy to (SMD)), Exchange Rate (EXC) and Trade Openness (TRADE) as independent variables and GDP as the dependent variable. Data from 1981 to 2020 is analyzed using Granger causality, and the ARDL method along with applying the Endogenous Growth theory. The findings of the ARDL long-run test suggested that SMD and TRADE have a positive and statistically insignificant relationship with GDP. EXC has a negative and statistically significant relationship with GDP. Granger causality test suggested a bidirectional relationship between EXC and TRADE with GDP. There is a unidirectional causality between SMD and GDP where GDP Granger causes SMD. To improve market regulation, The government should ensure the stock market is well-regulated and transparent, boost investor confidence, and increase market investment. Encouraging trade openness and exports can also help increase exchange rates and boost ringgit's demand.

Keywords: *Stock Market Development, Market Capitalization, Economic Growth, ARDL, Granger Causality.*

1. Introduction

The capital market is an important factor enabling economic growth. Capital markets are a subset of the financial system that acts as an engine of growth in modern economies (Nathaniel, Omojolaibi, & Ezeh, 2020). Financial development promotes economic development either through bank-based financial development, market-oriented financial development, or both. In different countries, economic development occurs in one or both directions (Md. Qamruzzaman & Wei, 2018). Stock markets are important among many financial markets for three main reasons: the liquidity they provide to financial assets, the important capital flows they channel, and the fact that they are very useful sources of information for investors (Prats and Sandoval, 2020)). Apart from the rational productive use of wasted money, the stock market provides a channel for international investment and the inflow of foreign funds to develop initiatives that benefit citizens (Owolabi and Motilewa, 2015) as cited in (Nathaniel, Omojolaibi, & Ezeh, 2020). The purpose of this study is to examine the impact of stock market development on economic growth in Malaysia. The stock market is an indicator of the economy and financial condition. It reflects the mood of the country and investors.

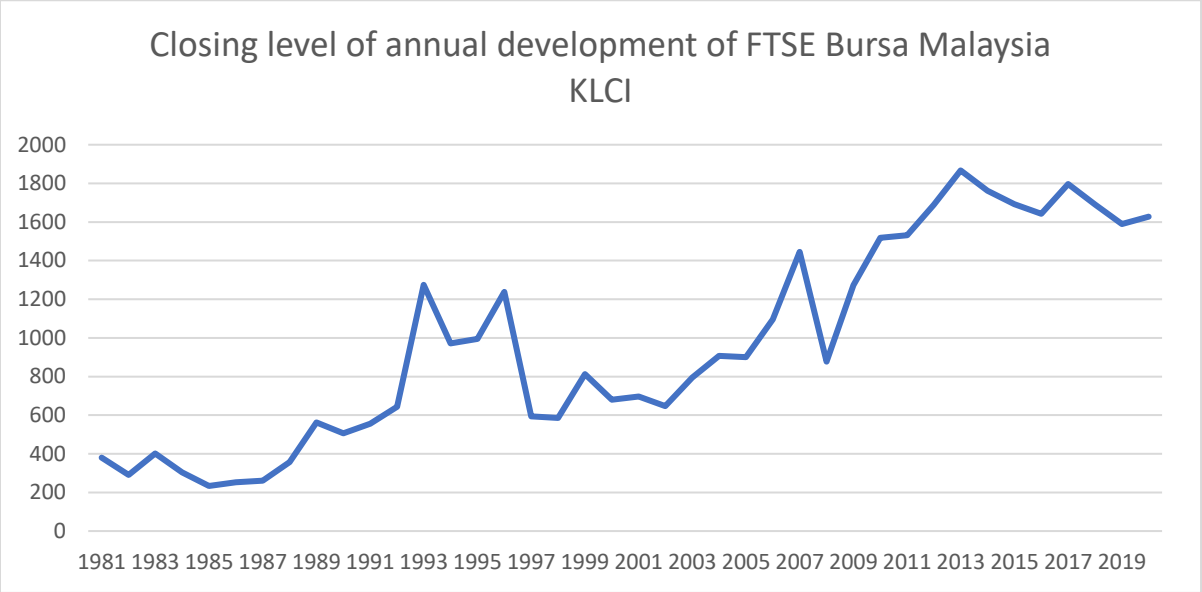
Therefore, stock market development is a key part of economic growth. The term stock market refers to several exchanges where shares of listed companies can be bought and sold. Such financial activities take place through regulated exchanges and for-sale markets that follow certain rules (Chen, 2023). On the other hand, Gross Domestic Product (GDP) is useful for economists and investors because it provides information about the size and performance of the economy. Economic growth has a significant impact on almost all market sectors. Economic growth is defined as an increase in the production of economic goods and services from one period to another. This can be expressed in nominal or real (inflation-adjusted) terms (The Investopedia Team, 2023). Malaysia is a developing country and one of the world's most open economies, with trade as a percentage of GDP averaging more than 130 percent since 2010 (The World Bank, 2022). The name of the Malaysian stock market is FTSE Bursa Malaysia KLCI, also known as FBM KLCI. Bursa Malaysia is Malaysia's capital market and first-line regulator responsible for ensuring a fair and orderly market for securities and derivatives trading through its facilities (Bursa Malaysia Berhad, 2023).

Background of Study: Endogenous growth theory is used in this research because many previous studies explain well the relationship between stock market development and economic growth. Pradhan et al. (2015) highlighted the importance of stock market development in promoting long-term economic growth as it facilitates efficient intertemporal resource allocation, capital accumulation, and technological innovation. For endogenous growth models, Owusu (2016) argued that the relationship between financial development, investment, and economic growth focuses on financial markets, saving, investment, and economic growth. Economic Growth (GDP) will be used as the dependent variable, while Stock Market Development (SMD), Exchange Rate (EXC), and Trade (TRADE) as independent variables in this study. Malaysia experienced a recession for the first time in 1985. And in 1997 and 2008 the recession happened again. The Malaysian economy went into a recession in 1985, and it shrank by 6.7% in 1998. By almost all measures, the recession in 1997 was worse than the one it went through in 1985. With a moderate 10 percent decline, the recession that year only lasted one year. In the period from July 1997 to mid-January 1998, the value of shares dropped by almost US $225 billion. The financial crisis quickly affected the real economy, as shown by business closures, layoffs that resulted in high unemployment, and rising inflation rates (Ariff & Abubakar, 1999).

Excessive bank lending, especially in the form of mortgages, began in the United States in 2008-2009. the main cause of the global financial crisis. Banks repackaged those debts and sold them to investors. When the housing bubble burst, it caused borrowers to default, weakened the US banking system, and eventually forced several institutions into liquidation. Malaysia has been adversely affected by its trade and financial channels. Malaysia, a country heavily dependent on trade, has been hit hard in terms of investment and trade. In 2009, the economy of Malaysia fell into a recession, contracting 1.7% (Lee, 2020). When Malaysia and Singapore separated in 1964, the Malaysia Stock Exchange was officially established. In addition, the broader SEMS exchange was led by the Malaysian and Singaporean exchanges. With the end of currency exchange between Malaysia and Singapore in 1973, the SEMS was split into the Kuala Lumpur Stock Exchange (KLSEB) and the Singapore Stock Exchange (SES) (Bursa Malaysia Berhad, 2023). However, Malaysian companies continued to be included in the SES and vice versa. In 1994, the Kuala Lumpur Stock Exchange (KLSE) took over the operations of KLSEB and number 039; the Stock Exchange. In 2004, Bursa Malaysia was the name of the demutualized platform formerly known as KLSE (Lee, Kogid, & Lily, 2020). According to Prats and Sandoval (2020) (Prats & Sandoval, 2020), there is evidence that GDP and stock market value are causally related in both directions. Ho (2018) suggests that the stock market promotes growth in both the long and short term.

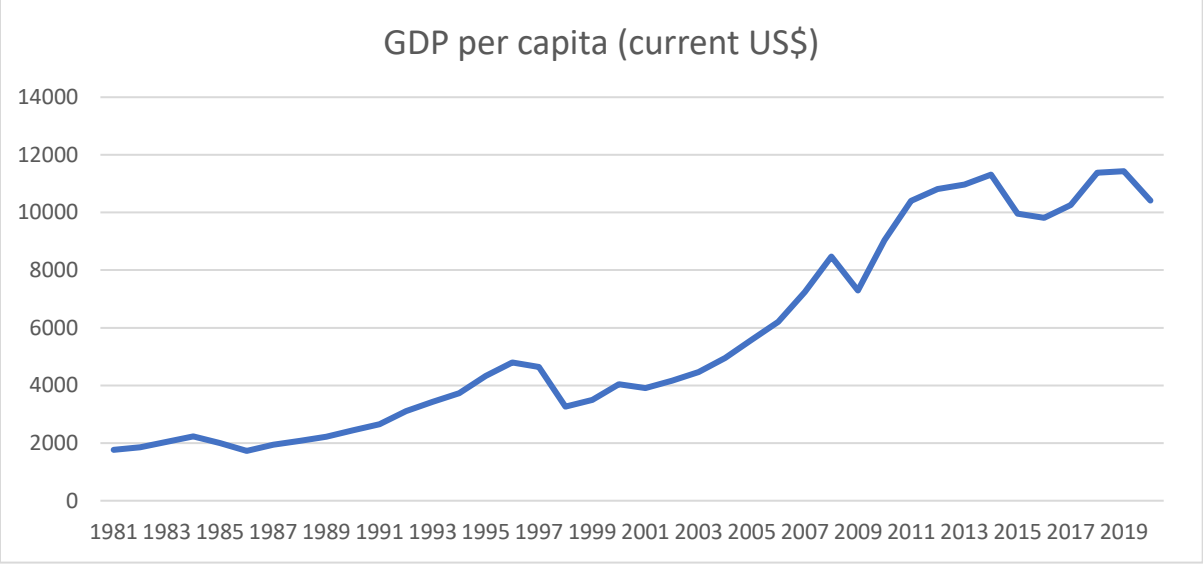
Problem Statement: The recession crisis in 1985, 1997, and 2008 has affected the Economic Growth (GDP) and Stock Market Development (SMD) in Malaysia badly. In general, rising market capitalization/Stock Market Development (SMD) may signal increased investor confidence and capital availability, which may lead to increased levels of investment, entrepreneurship, and innovation, thereby promoting Economic Growth (GDP). According to Levine (1997) countries with developed stock markets have faster economic growth and higher levels of investment than countries with less developed stock markets. However, there were different reactions by investors and individuals overall in the economy in other words, there was an inconsistent trend between Stock Market Development (SMD) and Economic Growth (GDP) when the global recession in 2008 happened and when the Coronavirus disease (COVID-19) started to spread. Both variables move in a different direction when generally the trend between Stock Market Development (SMD) and Economic Growth (GDP) should be moving in the same direction. An increase in market capitalization/Stock Market Development (SMD) will lead to an increase in Economic Growth (GDP). But in the case when the global recession in 2008, the trend of Stock Market Development (SMD) decreased while the trend of Economic Growth (GDP) increased. Meanwhile, in the case when the Coronavirus disease (COVID-19) started to spread, the trend of Stock Market Development (SMD) increased while the trend of Economic Growth (GDP) decreased. This study will focus on determining the impacts of Stock Market Development (SMD) and Economic Growth (GDP). The effect of the recession crisis and the recent pandemic can be seen in the trend charts below.

Figure 1: The Trend Chart of Stock Market Development in Malaysia from 1981 to 2020



Source: Wikipedia, Meridian Securities Markets, Electronic Commerce Inc.: World Stock Exchange Fact Book (FTSE Bursa Malaysia KLCI, 2023).

Figure 2: The Trend Chart of Economic Growth in Malaysia from 1981 to 2020



Source: (The World Bank, 2022).

Looking at the trend charts above, Figure 1 shows the trend chart of stock market development in Malaysia from 1981 to 2020 using the data closing level of annual development of FTSE Bursa Malaysia KLCI. The source of data is Wikipedia. However, the actual data was sourced from Meridian Securities Markets, Electronic Commerce Inc.: World Stock Exchange Fact Book. The closing level of annual development of FTSE Bursa Malaysia KLCI data is used in portraying the trend of Stock Market Development (SMD) in Malaysia. We can see the trend in the year 1985 hit the lowest closing level at 233.48. In 1997, there was a sharp downtrend from the closing level in 1996 from 1,237.96 to 594.44. In 1998, the closing level got worse to 586.13. This recession is the worst so far. Nevertheless, the global recession in 2008 also affected the economy of Malaysia pretty badly. There was also a sharp downtrend just like the recession that happened in 1997, but not as bad as the 1997 recession. The closing level in 2007 was 1,445.03 and the sharp downtrend made the closing level in 2008 into 876,75. But gladly, this 2008 recession recovered quickly. In the next year, in 2009 and 2010 the closing

level climbed fast to 1,272.78 and 1,518.91 respectively. Figure 2 shows the trend chart of Economic Growth in Malaysia from 1981 to 2020. The data was sourced from World Bank data. The GDP per capita is used to show the economic growth trend.

Just like the trend chart for the Stock Market Development (SMD), the trend for Economic Growth was also affected by the recession in the years 1985, 1997, and 2008. In the 1985 recession, the GDP per capita slightly decreased from $2234.26 in 1984 to $2000.15 in 1985. The recession continued into 1986 when the GDP per capita decreased to $1728.68. After that, starting from 1987, the trend stably increases until the next recession. The recession in 1997 was a catch in the trend where there was a downtrend from $4798.61 in 1996 to $4,637. 87 in 1997. The recession effect continued in 1998 when the trend decreased to $3263.33. The trend for Economic Growth during the recession in 2008 reacted differently than the trend for Stock Market Development (SMD). Unlike the sharp downtrend shown by the Stock Market Development (SMD) trend, the Economic Growth trend went uptrend from $7243.46 in 2007 to $8474.59 in 2008. The effect of the global recession in 2008 was kind of delayed. In 2009, the GDP per capita decreased to $7292.50 and quickly recovered the year after. The trend chart for both Stock Market Development (SMD) and Economic Growth did not react the same when the Coronavirus disease (COVID-19) started to spread. The first case of COVID-19 detected in Malaysia was on the 25th of January 2020. The price level for the Stock Market Development increased from 1,588.76 in 2019 to 1,627 in 2020. Oppositely, the Economic Growth trend decreased from $11432.83 in 2019 to $10412.35 in 2020.

Research Questions

RQ1: What are the impacts of Stock Market Development (SMD), Exchange Rate (EXC), and Trade Openness (TRADE) on Economic Growth (GDP) in Malaysia?

RQ2: Is there a significant and causal relationship between Stock Market Development (SMD), Exchange Rate (EXC), and Trade Openness (TRADE) with Economic Growth (GDP) in Malaysia?

Research Objectives

RO1: To determine the impacts of Stock Market Development (SMD), Exchange Rate (EXC), and Trade Openness (TRADE) on Economic Growth (GDP) in Malaysia.

RO2: To examine the significant and causal relationship between Stock Market Development (SMD), Exchange Rate (EXC), and Trade Openness (TRADE) with Economic Growth (GDP) in Malaysia.

Scope of Study: This study will focus on the impact of Stock Market Development (SMD) on Economic Growth (GDP). The dependent variable is Economic Growth (GDP). The independent variables are Stock Market Development (SMD), Exchange Rate (EXC), and Trade Openness (TRADE). This study uses 40 years of data for each variable which is from 1981 to 2020. The theory that will be used in this study is the Endogenous Growth Theory. This study focuses on Malaysia, so we are applying a time-series econometric technique to regress the data using E-Views.

Limitation of Study: There may be some possible limitations in this study. The first limitation is this study uses E-Views Student Version Lite as a medium to regress the data. The E-Views Student Version Lite is the only regression medium available for the student for free. A regression medium like Stata is a paid medium. As a student, we could not afford to purchase the service. There are a few restrictions in using E-Views Student Version Lite such as excluded features, capacity restrictions, and saving and output restrictions. The second limitation is the limited access to the information. The data that will be used in this study are not so up to date because of the not-yet-updated data in the World Bank data. Up until January 2023, the last updated date for the Stock Market Development (SMD) data was on 22/12/2022. The data for the Stock Market Development (SMD) variable is only available until the year 2020 on the World Bank data. This study may also have been limited by the size of the sample. The data provided by the World Bank data for the variable of market capitalization (proxy of SMD) is only available from 1981 to 2020 which is for only 40 years. Notice that this study sample size is also 40 years. This is due to the limited data for the market capitalization provided in the World Bank database.

Significance of Study: The significance of this study is that this study can benefit future researchers when they study the related effects of stock market development on economic growth. Since the main purpose of this

paper is to find out the relationship between economic growth and stock market value in Malaysia, the time series method is used in this study. Focus on Malaysia. There are many studies of stock market development (SMD) in the economics and finance literature, but most of them use cross-country data. The use of panel data does assist in gaining a broader perspective on an issue, but it lacks specificity. This study exists to fill the small gap because few studies on the relationship between Economic Growth (GDP) and Stock Market Development (SMD) have been studied specifically for Malaysia. Furthermore, this research will explore not only the relationship between Stock Market Development (SMD) on Economic Growth (GDP) but also the relationship between the other independent variables, Exchange Rate (EXC) and Trade Openness (TRADE) on Economic Growth (GDP). Moreover, because this study is related to Stock Market Development (SMD) and Economic Growth (GDP), this study might benefit the investor and trader. Specifically Malaysian investors and traders are using FTSE Bursa Malaysia KLCI (FBM KLCI) as their main trading medium. They can use the result of this study as a piece of additional knowledge to be used while making decisions before buying or selling the potential stock.

As outlined in Chapter 1, this chapter is about the introduction of this study. Mentioning that the capital market is a vital enabling factor for economic growth and how important is a stock market among many financial markets. This introduction part also includes the background of the study, problem statement, research questions, research objectives, the scope of the study, limitations of the study, and the significance of the study.

2. Literature Review

The purpose of this study's literature review is to examine how Malaysia's Stock Market Development (SMD) impacts Economic Growth (GDP). In this literature review, prior studies and researchers were referenced to back up the theory that the independent variables and the dependent variable are significantly related.

Theoretical Literature

Endogenous Growth Theory: This study applies the Endogenous Growth theory. According to the Endogenous Growth theory, economic growth is driven by a country's investment in human capital, innovation, and technological advancements (Romer (1986, 1990); Lucas, 1988) as cited in Bawazir, Kumar, Celik, Abdulla, & Aktan, 2020). Endogenous Growth theory is used in some of the prior research studies. Araoye et al. (2018) in the late 1980s and early 1990s, economists Paul Romer and Robert Lucas Jr. developed a theory of endogenous growth that included a mathematical rationale for technological improvement. According to the theory of endogenous growth, the rate of investment has a favorable effect on economic growth (GDP). Using this variable and stock market returns, Yartey and Adjasi (2007) and Adenuga (2010) as cited by Naik and Padhi (2015) found that investment rate contributes positively to economic growth (GDP). This theory is used in this study to determine whether stock market development (SMD) affects economic growth (GDP) in Malaysia, where both stock market development (SMD) and economic growth (GDP) were inconsistent. there was a global economic recession in 2008 and the spread of the Corona Virus Disease (COVID-19).

Empirical Literature

Stock Market Development (SMD) and Economic Growth (GDP): Revisiting Stock Market Development and Economic Growth Nexus: The moderating role of foreign capital inflows and exchange rates that focuses on Malaysia, was the title of a research article by Hoque & Yakob (2017). This study re-examines the relationship between stock market development (SMD) and economic growth (GDP). The authors examine the effect of foreign capital flows and exchange rates on the relationship between stock market development (SMD) and economic growth (GDP) in Malaysia from 1981 to 2016. According to the Granger causality test results, there are sometimes unidirectional effects. Stock Market Development (SMD) and Malaysia Economic Growth (GDP). This study finds a long-run relationship between stock market development (SMD) and economic growth (GDP) using a cointegration test.

However, the ARDL model finds that in the short and long run, the stock market increases Malaysia's economic growth (GDP), which is consistent with the Granger causality test. Naik and Padhi (2015) investigated the relationship between stock market development (SMD) and economic growth (GDP) in emerging economies

using a dynamic panel. The study used annual data from 27 emerging economies from 1995 to 2012. Naik and Padhi employed a second-generation panel unit root test to test the stationary properties of the data series and employed a dynamic panel "system GMM" estimator because there was an endogeneity problem that existed in their model. To examine the direction of causality among the variables, the authors use a heterogeneous panel causality test. The research results show that the growth of stock market development (SMD) has a significant impact on economic growth (GDP).

Unidirectional causality was also found linking stock market development (SMD) to economic growth (GDP). This finding supports the temporal concept. In addition to stock market development (SMD), economic growth (GDP) is significantly influenced by macroeconomic variables such as the investment rate, trade openness, and exchange rates. Pradhan et al. (2018) investigated the dynamics of Bond Market Development, Stock Market Development (SMD), and Economic Growth (GDP) in the G-20 countries. The study explores whether there are Granger causal relationships between Bond Market Development, Stock Market Development (SMD), Economic Growth (GDP), and two additional macroeconomic variables, namely the Inflation Rate and the Real Interest Rate. This paper uses a panel data collection of G-20 countries from 1991 to 2016. It uses a panel vector autoregression model to determine the nature of the Granger causality between these five variables. The study provides empirical evidence that bond and stock market developments are related to economic growth (GDP), inflation, and real interest rates. The panel Granger causality test shows, among other things, that long-term economic growth is caused by bond market development, stock market development (SMD), economic growth (GDP), inflation and real interest.

The short-run Granger causality results, on the other hand, showed a wide range of short-run adjustment dynamics between these five variables, including the possibility of feedback in several cases. Causality between Stock Market Development (SMD) and Economic Growth (GDP): Econometric Evidence from Bangladesh is the title of Mamun et al. (2018) research paper. This study examines time-series evidence on the impact of stock market development (SMD) on Bangladesh's economic growth (GDP) from 1993 to 2016. Using an ARDL bounds testing approach, the authors find that stock market performance (SMD) directly affects economic growth (GDP) in both the short and long term, along with financial depth, interest rate spread, and real effective exchange rate. Between 1990 and 2020, Thaddeus et al. (2021) explored the short and long-run causal relationship between Stock Market Development (SMD) and Economic Growth (GDP) in Sub-Saharan Africa. This study uses an autoregressive distributed lag model and Granger causality and cointegration to examine the long-run and short-run causality between stock market development (SMD) and economic growth (GDP) in sub-Saharan Africa.

The results revealed that stock market development (SMD) had a positive and significant effect on long-term economic growth (GDP) in sub-Saharan Africa between 1990 and 2020 and a negative insignificant effect on short-term economic growth (GDP). Stock market liquidity, as measured by the total value of traded shares and the exchange rate, had a negative and significant impact on Sub-Saharan Africa's economic growth (GDP) between 1990 and 2020. Pradhan et al. (2020) analyzed the interrelationships between financial sector reforms (banking, stock market, and insurance industries) and European Economic Growth (GDP). In particular, the study investigated whether there is a Granger causality between banking competitiveness, stock market development (SMD), insurance market development, and economic growth (GDP). The study used panel data covering European countries from 1996 to 2016. Survey results. indicates that all variables are integrated. The results show Granger causality between network variables, including short-run bidirectional causality between stock market development (SMD) and insurance market development. There is substantial evidence of Granger causality from bank competition, insurance market development, and stock market development (SMD) to economic growth (GDP) in the long run.

Nathaniel, Omojolaibi and Ezeh (2020) examined the impact of stock market development (SMD) on economic growth (GDP) in Nigeria. The study covers the years 1980-2016. Joint integration uses the ARDL approach. Research and evidence suggest that stock market development (SMD) increases economic growth (GDP) in the short run, but the growth effect of stock market development (SMD) in the long run is insignificant. In the short run, the effects of stock market development (SMD), stock market value, and market conditions on economic growth (GDP) are all significant, although trade openness is not. Hoque et al. (2018) examined the endogeneity of FDI, economic growth (GDP), and stock market development (SMD) and the moderating role of political

instability in the relationship between these three variables. To test the hypotheses, the research uses selected data on macroeconomic variables from 1993 to 2016 using the Auto Regressive Distributed Lag (ARDL) method and the hierarchical regression method. This study shows the short- and long-term relationship between economic growth (GDP), foreign direct investment, and stock market development (SMD).

In the long run, there is only a unidirectional relationship between economic growth (GDP), foreign direct investment, and stock market development (SMD). However, there is a bidirectional relationship between Economic Growth (GDP) and Stock Market Development (SMD) in the short run. Pan and Mishra (2017) investigated the effects of the Stock Market's link with real Economic Growth (GDP) on the Chinese economy, which is the world's fastest growing and largest emerging economy. The methodology used in this study involves unit root testing in the presence of structural breaks and the Autoregressive distributed lag (ARDL) model, as well as employing the data from the global financial crisis from 2007 to 2012. According to the findings, the global financial crisis from 2007 to 2012 had a significant influence on both the real and financial sectors in China. Md. Qamruzzaman and Wei (2018) studied Financial Innovation, Stock Market Development, and Economic Growth: An ARDL Model Application. They examine the relationships between economic growth (GDP), financial innovation, and stock market development (SMD) in Bangladesh between 1980 and 2016.

The study used the autoregressive distributed lagged bounds (ARDL) test method for long-term evaluation. promote co-integration. In addition, a Granger causality test with an error correction term is used to determine the trend-causal relationship between the variables under study. The results of ARDL's related test method study show that there is a long-term relationship between financial innovation, stock market development (SMD), and economic growth (GDP). In addition, the Granger causality test results show bidirectional causality between financial innovation and economic growth (GDP) and stock market development (SMD) and economic growth (GDP) in both the long and short run. More on the relationship between Stock Market Development (SMD) and Economic Growth (GDP), Prats and Sandoval (2020) discovered that there is evidence of a causal relationship between Stock Market Development (SMD) and Economic Growth (GDP) in both directions. According to Ho (2018), Stock Market Development (SMD) promotes Economic Growth (GDP) in both the short and long run. Stock Market Development (SMD) has a positive significant impact on Economic Growth (GDP). according to Lazarov, Miteva-Kacarski, & Nikoloski (2016), Sattar, Ali, Rehman, & Naeem (2018), Adaramola & Popoola (2019), Nguyen & Bui (2019) and Osaseri & Osamwonyi (2019). According to Fuinhas et al. (2019) Stock Market Development (SMD) has a long-term impact on Economic Growth (GDP). According to Nguyen et al. (2020), SME Stock Market Development (SMD) and/or innovation have small but positive effects on short-run Economic Growth (GDP). Hossin and Islam (2019) discovered unidirectional causality between Stock Market Development (SMD) and Economic Growth (GDP). There is also a negative relationship between Stock Market Development (SMD) and Economic Growth (GDP). According to Owusu (2016) research, Stock Market Development (SMD) harms Economic Growth (GDP) in Nigeria in the long run.

Exchange Rate (EXC) and Economic Growth (GDP): Since the collapse of the Bretton Woods Agreement in 1973, economists have long studied the impact of exchange rate volatility on the economy (Bahmani-Oskooee et al., 2016; Chi, 2018; Fall, 2019; Qureshi and Tsangarides, 2012; Romelli et al., 2018; Tunc et al., 2018) as cited in Lawal, et al., (2022). For Economic Growth (GDP), the Exchange Rate (EXC) is critical. The rise and fall of the Exchange Rate (EXC) have an impact on both global and local Economic Growth (GDP). As a result, domestic currency appreciation can have a positive or negative impact on economic growth (Arthur & Addai, 2022). In a study titled The Dynamic Interactions of Economic Growth, Foreign Direct Investment, and Exchange Rate in Ghana, the relationship between the Exchange Rate (EXC) and Economic Growth (GDP) in Nigeria and Ghana has been studied. The authors concluded that the exchange rate (EXC) has a positive and significant impact on economic growth (GDP) in the long and short term (Arthur & Addai, 2022).

A study by Hoque and Yakob (2017) that looks into the effects of Stock Market Development (SMD) on Economic Growth (GDP), as well as the moderating role of Foreign Capital Inflows and Exchange Rate (EXC) claims that the Exchange Rate (EXC), Foreign Investment, and Economic Growth (GDP) are all closely linked. According to Rodik (2008) as cited in Hoque and Yakob (2017), a decline in exchange rates (EXC) promotes economic growth (GDP) in developing countries. On the other hand, high inflation (EXC) is associated with slow economic growth (GDP). A regression test was conducted and the results showed that stock market development (SMD) has a significant effect on economic growth (GDP). On the other hand, the inflow of foreign

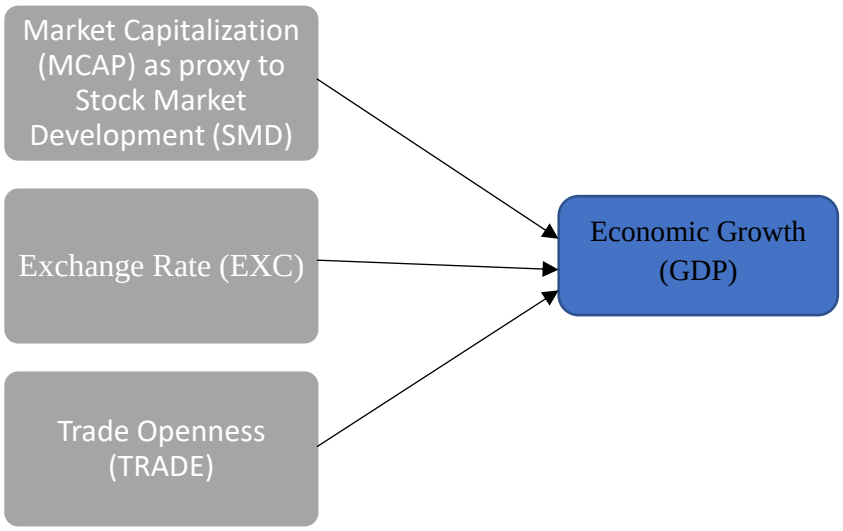
currency affects economic growth (GDP) and at the same time reduces the relationship between stock market development (SMD) and economic growth (GDP). Likewise, the Exchange Rate (EXC) has a negative impact on Economic Growth (GDP) (Hoque & Yakob, 2017).

Trade Openness (TRADE) and Economic Growth (GDP): Trade Openness (TRADE) has been argued to potentially long-term economic growth (GDP) through several channels, including access to technology and knowledge, financial inclusion of globalization, efficient and effective allocation of resources, access to diverse markets, improvement in domestic factor productivity, the attractiveness of foreign capital, and finally international cooperation (Louardy & Moussamir, 2022). Louardy and Moussamir (2022) found that Morocco's openness to international trade (TRADE) has a positive effect on economic growth (GDP) in the short term. However, the long-term effects are negative, especially considering the existence of a bidirectional causal relationship between two variables: economic growth (GDP) and international trade (TRADE). To explore the results, the authors apply statistical and econometric tests based on the ARDL bounds test for cointegration and the Toda-Yamamoto causality test.

In a research paper titled Economic Growth, Exchange Rate, and Remittance Nexus: Evidence from Africa by (Lawal, et al., 2022). The authors examined the relationships between economic growth (GDP), exchange rate (EXC), remittances, trade openness (TRADE), and agricultural production in 10 African countries from 1980 to 2018. Results of the Granger causality test include the gross domestic product (GDP), exchange rate (EXC), trade openness, agriculture, and remittances. Nguyen (2022) uses vector autoregressive models to examine the relationship between economic growth (GDP), foreign direct investment (FDI), trade openness (TRADE), and unemployment in five South Asian countries from 1998 to 2017. Research shows a long-run relationship between economic growth (GDP), foreign direct investment, trade openness (TRADE), and unemployment in South Asia.

Theoretical Framework

Figure 3: The Relationship Between a Dependent Variable and Independent Variables



This theoretical framework, (Figure 3) shows the relationship between a dependent variable with independent variables. Economic Growth (GDP) is the dependent variable, while Market Capitalization (MCAP) is a proxy for Stock Market Development (SMD), Exchange Rate (EXC), and Trade Openness (TRADE) as independent variables. The three independent variables all have an impact on the dependent variable, Economic Growth (GDP).

The Endogenous Growth theory was well explained by past researchers. The empirical part explains the relationship between each independent variable with the dependent variable by past researchers.

3. Methodology

The methodology in this study allows readers to assess the study's overall validity and reliability. This chapter will go over model specification, tests for this study, regression equation, coefficient of determination, and regression coefficient analysis. When the results are positive and significant, the research objectives can be attained. If the results are perfectly positive, they can be used to tackle the problem of economic growth and come up with numerous solutions to boost Malaysia's economic growth.

Econometrics Model: To identify the relationship between Economic Growth and Market Capitalization (MCAP), Exchange Rate (EXC), and Trade Openness (TRADE) on Economic Growth (GDP), the statistical method uses multiple regression analysis with ordinary least squares. The equation of estimation of models:

$$Y = \beta_0 + \beta_1\chi_t + \beta_2\chi_t + \beta_3\chi_t + \mathcal{E}_t \quad \ldots(1)$$

$$LNGDP_t = \beta_0 + \beta_1 LNMCAP_t + \beta_2 LNEXC_t + \beta_3 LNTRADE_t + \mathcal{E}_t \quad \ldots(2)$$

Where:
β_0 = Constant term
$\beta_1, \beta_2, \beta_3$ = Regression coefficients
$LNGDP_t$ = Log Gross Domestic Product for t period (Dependent Variable)
$LNMCAP_t$ = Log Market Capitalization for t period [as a proxy of Stock Market Development (SMD)]
$LNEXC_t$ = Log Exchange Rate for t period
$LNTRADE_t$ = Log Trade Openness for t period
$\mathcal{E}_t$ = Error term for t period
To eliminate the effect of the outlier, all variables were transformed to logarithmic form because logarithmic values have a lower tendency to fluctuate over time and to achieve linearity and reduce the problem of heteroscedasticity (Gujarati & Porter, 2009).

Measurement of the Variables and Sources of Data: The data type that will be used in this study is secondary data. The source of data of this study is all collected and extracted from a credible data provider that is World Bank data for the period between 1981 to 2020. The total observation in this study consisted of 40 observations for each variable. The Market Capitalization (MCAP) is used as a proxy for Stock Market Development (SMD). According to Md. Shakhaowat Hossin and Md. Shafiul Islam (2019), and Thaddeus, et al. (2021), these authors use The Market Capitalization (MCAP) as the proxy of Stock Market Development (SMD).

Table 1: The Measurement of Dependent Variable and Independent Variables

Bil	Mnemonic	Definition and Measurement	Sources
Dependent Variables	Economic Growth (GDP)	"GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for the depreciation of fabricated assets or for the depletion and degradation of natural resources. Data are in current U.S. dollars. Dollar figures for GDP are converted from domestic currencies using single year official exchange rates. For a few countries where the official exchange rate does not reflect the rate effectively applied to actual foreign exchange transactions, an alternative conversion factor is used." (GDP (current US$))	World Bank data
Independent Variables			
	Market Capitalization (MCAP) as a	"Market capitalization (also known as market value) is the share price times the number of shares outstanding (including their several classes) for listed domestic	World Bank data

	proxy to Stock Market Development (SMD)	companies. Investment funds, unit trusts, and companies whose only business goal is to hold shares of other listed companies are excluded. Data are end of year values converted to U.S. dollars using corresponding year-end foreign exchange rates." (Market capitalization of listed domestic companies (current US$))	
	Exchange Rate (EXC)	Official exchange rate refers to the exchange rate determined by national authorities or to the rate determined in the legally sanctioned exchange market. It is calculated as an annual average based on monthly averages (local currency units relative to the U.S. dollar). (Official exchange rate (LCU per US$, period average))	World Bank data
	Trade Openness (TRADE)	Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product. (Trade (% of GDP))	World Bank data

Hypothesis Development: This research paper will look into the corresponding theory and will accordingly identify the impact of Stock Market Development (SMD) on Economic Growth (GDP) in Malaysia, additionally with the other two independent variables, Exchange Rates (EXC) and Trade Openness (TRADE), that are believed to have an impact on Economic Growth (GDP) as well. This study will test the assumption of the Endogenous Growth Theory in determining the relationship between Stock Market Development (SMD) and Economic Growth (GDP) in Malaysia. Past studies have indicated that the investment ratio, according to the Endogenous Growth theory, has a positive effect on economic growth (GDP). Yartey and Adjasi (2007) and Adenuga (2010) as cited in Naik and Padhi (2015) discovered that the investment ratio positively promotes Economic Growth (GDP) using this variable of Stock Market Development (SMD).

Hypothesis 1:

H_1: there is no significant relationship between Stock Market Development (SMD) and Economic Growth (GDP) in Malaysia.

H_2: there is a significant relationship between Stock Market Development (SMD) and Economic Growth (GDP) in Malaysia.

Hypothesis 2:

H_1: there is no significant relationship between Exchange Rates (EXC) and Economic Growth (GDP) in Malaysia.

H_2: there is a significant relationship between Exchange Rates (EXC) and Economic Growth (GDP) in Malaysia.

Hypothesis 3:

H_1: there is no significant relationship between Trade Openness (TRADE) and Economic Growth (GDP) in Malaysia.

H_2: there is a significant relationship between Trade Openness (TRADE) and Economic Growth (GDP) in Malaysia.

Research Design: This research paper studies the impact of Stock Market Development (SMD) on Economic Growth (GDP) in Malaysia using quantitative analysis. This quantitative analysis is used to examine the data and test the study's hypotheses. This research mainly relied on secondary data from the World Bank data. This paper used time-series data to measure all independent variables data such as Stock Market Development (SMD), Exchange Rate (EXC), and Trade Openness (TRADE), and a dependent variable, Economic Growth (GDP) from 1981-2020 (40years). The time-series data was used because this study only focuses on one country that is Malaysia. This study used E-views to test the data and determine the result using the Autoregressive distributed lag (ARDL) method and Granger Causality test.

Statistical Analysis

Unit Root Test

H_1: δ = 0 (There is a unit root or the data is nonstationary.)
H_2: δ ≠ 0 (There is no unit root or the data is stationary.)

Autoregressive Distributed Lag (ARDL)
H_1 = ג1 + ג2 + ג3 = 0 (No co-integration exists)
H_2 = ג1 + ג2 + ג3 ≠ 0 (Co-integration exist)
The ARDL models can be expressed as below, following the study of Pesaran et al. (2001) as cited in Raza, Jawaid, Afshan, & Karim, 2015).

$$\Delta GDP_t = \Psi_0 + \Psi_1 \sum_{i=1}^{p} \Delta GDP_{t-1} + \Psi_2 \sum_{i=1}^{p} \Delta MCAP_{t-1} + \Psi_3 \sum_{i=1}^{p} \Delta EXC_{t-1} + \Psi_4 \sum_{i=1}^{p} \Delta TRADE_{t-1} + \gamma_1 GDP_{t-1} + \gamma_2 MCAP_{t-1} + \gamma_3 EXC_{t-1} + \gamma_4 TRADE_{t-1} + \varepsilon_t \quad \ldots(3)$$

Where Ψ_0 is the constant and ε_t is the white noise error term; the error correction dynamics is denoted by a summation sign, while the second part of the equation corresponds to a long-run relationship.

The following model will be used to estimate the long-run coefficients:

$$the\ the\ GDP_t = \lambda_0 + \lambda_1 \sum_{i=1}^{p} GDP_{t-1} + \lambda_2 \sum_{i=1}^{p} MCAP_{t-1} + \lambda_3 \sum_{i=1}^{p} EXC_{t-1} + \lambda_4 \sum_{i=1}^{p} TRADE_{t-1} + \varepsilon_t \quad \ldots(4)$$

Where λ_0 is the constant and ε_t is the white noise error term.

To estimate the short-run coefficients by using the following model:

$$\Delta GDP_t = \phi_0 + \phi_1 \sum_{i=1}^{p} \Delta GDP_{t-1} + \phi_2 \sum_{i=1}^{p} \Delta MCAP_{t-1} + \phi_3 \sum_{i=1}^{p} \Delta EXC_{t-1} + \phi_4 \sum_{i=1}^{p} \Delta TRADE_{t-1} + nEC_t + \varepsilon_t \quad \ldots(5)$$

The error correction model shows the speed of adjustment needed to restore the long-run equilibrium following a short-run shock. Here, n is the coefficient of error correction term in the model that indicates the speed of adjustment.

Diagnostic Test

Normality Test
H_1: The residual is normally distributed.
H_2: The residual is not normally distributed.

Serial Correlation
H_1: The residual has no serial correlation.
H_2: The residual has a serial correlation.

Heteroscedasticity
H_1: Homoscedasticity is present (the residuals are distributed with equal variance)
H_2: Heteroscedasticity is present (the residuals are not distributed with equal variance).

Stability Test

Granger Causality Test

The methodology used in this study was discussed in terms of the measurement of the data, the definition of the data, the source of the data, the hypothesis development, the research design, and the method of estimation. Firstly, the unit root test was performed. Secondly, the ARDL method was performed. Thirdly, the diagnostic test as well as the stability test were performed. Lastly, the Granger Causality test was performed.

4. Results and Discussion

The results and discussion chapter presents the findings of the research study and provides an in-depth analysis of the data collected. It gives a general idea of the crucial results of the study and offers insights into the underlying meaning and importance of these findings. The discussion part relates the outcomes to previous research, emphasizing similarities and disparities in the results. The chapter concludes with a brief overview of the most important outcomes and their significance to the field of study. The results obtained by the tests like unit root, ARDL method, and Granger Causality will be discussed below.

Unit Root Test: Before proceeding to run the ARDL co-integration bound test, using the ADF, a unit root test was performed to determine the level of stationary for each variable.

Table 2: The Stationarity Results using Unit Root Test (ADF)

Variables	ADF At Level [I(0)] Prob.	First Difference [I(1)] Prob.	Conclusion
LNGDP	0.7506	0.0001	I(1)
LNMCAP	0.4992	0.0000	I(1)
LNEXC	0.6354	0.0002	I(1)
TRADE	0.6224	0.0038	I(1)

According to the results of the unit root Augmented Dickey-Fuller (ADF) test in Table 2, Economic Growth (GDP), Stock Market Development (SMD), Exchange Rate (EXC), and Trade Openness (TRADE) were at a non-stationary level and significant after the first difference stationary. All variables are stationary at first difference or integrated of order I(1). Hence, the Unit Root Test result shows that all the variables are stationary at the first difference, The ARDL approach can be applied as the method would only apply to a mixture of I(0) and I(1) data or with only purely I(0) and purely I(1) data (Pesaran et al., 2001) as cited in (Raza, Jawaid, Afshan & Karim, 2015).

Autoregressive Distributed Lag (ARDL): ARDL method is widely used in the analysis of time series data and is effective in modelling the interdependence of variables in both the short run and the long run. Since the result of the Unit Root test shows stationary at first difference or integrated of order I(1) for all variables, the ARDL method can proceed. Below are the results of the tests of the ARDL method.

Long Run Cointegration

Table 3: ARDL Bound Test Results

Computed F-statistic 23.6411 k=3, n=35	Critical Value Lower Bound	Upper Bound
1% significance level	2.37	3.2
5% significance level	2.79	3.67
10% significance level	3.65	4.66

To obtain the Long Run Cointegration, the Bound Test is used. The results of Table 3 show that the co-integration bound test revealed the computed F-statistics value of 23.6411, which exceeded the upper bound critical value of 3.67 at a 5% significance level. The comparisons indicated that the null hypothesis of no co-

integration was rejected. The bound test rejects the null hypothesis of no co-integration if the F-statistic is greater than the critical value of both the I(0) and I(1) regressors and does not reject it otherwise (Belloumi, 2014). Thus, the relationship of long-run cointegration existed between the variables in the model, namely the dependent variable of Economic Growth (GDP) and its independent variables of Stock Market Development (SMD), Exchange Rate (EXC), and Trade Openness (TRADE).

Long Run Coefficient

Table 4: ARDL Long Run Test Results

ARDL (1, 4, 0, 1) **Dependent Variable: DLNGDP**			
Variable	**Coefficient**	**Std. Error**	**Probability**
DLNMCAP	0.1104	0.1019	0.2894
DLNEXC	-1.2481	0.3616	0.0020
DTRADE	0.0029	0.0018	0.1135
C	0.0753	0.0161	0.0001

Based on Table 4, the result indicates that the proxy of Stock Market Development (SMD), Market Capitalization (MCAP) has a positive and statistically insignificant (at 0.05 level of significance) relationship with Economic Growth (GDP) in the long run. One percent increase in Market Capitalization (MCAP), will increase Economic Growth (GDP) by 0.1104% in the long run. Since MCAP has an insignificant relationship with GDP, this study does not support the Endogenous Growth theory that Stock Market Development (SMD) spurs Economic Growth (GDP). While Market Capitalization (MCAP) may have a positive effect on the economy, this effect is not large enough to be considered meaningful. This result has the same outcome with a study by Nathaniel et al., (2020), the result of long-run ARDL shows that Stock Market Development (SMD) has a positive but insignificant relationship with Economic Growth (GDP) in Nigeria. The authors conclude that in Nigeria, Stock Market Development (SMD) cannot be relied on to promote Economic Growth (GDP) in the long run.

These outcomes are not a shocking event, because as we look back at Figure 1 and Figure 2 of the trend chart of Stock Market Development and Economic Growth in Malaysia from 1981 to 2020, there were inconsistent trends in the movement between both variables. First, when the global recession in 2008 happened, the trend of Stock Market Development (SMD) decreased while the trend of Economic Growth (GDP) increased. When Market Capitalization (MCAP), a proxy of Stock Market Development (SMD) declines, it may indicate decreased investor confidence and capital availability, which can harm investment, entrepreneurship, and innovation, resulting in lower levels of economic growth (Demirgüç-Kunt & Levine, 1996). Second, when the Coronavirus disease (COVID-19) started to spread, the trend of Stock Market Development (SMD) increased while the trend of Economic Growth (GDP) decreased. A sudden increase in Market Capitalization (MCAP), a proxy of Stock Market Development (SMD), can indicate excessive speculation, which can lead to market volatility and economic instability. According to a study conducted by Demirgüç-Kunt and Levine (1996), while a well-developed stock market can boost economic growth in the short run, it can also cause financial instability and reduce economic growth in the long run if proper financial regulations and institutions are not in place.

Based on the table above, the only variable that impacts Economic Growth (GDP) is Exchange Rate (EXC). Exchange Rate (EXC) has a negative and statistically significant (at 0.05 level of significance) relationship with Economic Growth (GDP) in the long run. This indicates that the Exchange Rate (EXC) would affect Economic Growth (GDP) in the long run. One percent increase in Exchange Rate (EXC), will decrease Economic Growth (GDP) by 1.2481% in the long run. This result aligns with the past study by Hoque & Yakob (2017). The authors conclude that the Exchange Rate (EXC) has a negative and statistically significant impact on Economic Growth (GDP) in the long run. Exchange Rate (EXC) can have a positive or negative impact on Economic Growth (GDP) (Arthur & Addai, 2022). Trade Openness (TRADE) has a similar result to Stock Market Development (SMD) on Economic Growth (GDP). Trade Openness (TRADE) has a positive and statistically insignificant (at 0.05 level of significance) relationship with Economic Growth (GDP) in the long run. One percent increase in Trade Openness (TRADE), will increase Economic Growth (GDP) by 0.0029% in the long run. Although the impact is positive, since the result is insignificant, it is not large enough to be considered meaningful.

Short Run ECM Model

Table 5: Estimation of Short-Run ECM Model

ARDL (1, 4, 0, 1) Regressor	Coefficient	Prob.
CointEq(-1)	-0.8873	0.0000
MCAP	0.0223	0.3473
TRADE	0.0011	0.1732
R-squared	0.9035	
Durbin-Watson	2.1452	

Table 5 shows that the coefficient ECM for this model in the short run was negative relationship and statistically significant at 0.05 level of significance. In a dynamic model, the error correction term (ect(-1)) measures the rate at which adjustments are made to restore equilibrium. If the error correction term has a significant negative estimate, long-run equilibrium can be achieved. Its estimate is -0.8873, which corresponds to a 1.1-year change in deviations toward long-run equilibrium.

Diagnostic Test: For the diagnostic test for ARDL, serial correlation, heteroscedasticity, and normality tests were performed.

Table 6: Diagnostic Test for ARDL Result

Diagnostic Test	Chi-Square (p-value)	Findings
Breusch-Godfrey Serial Correlation LM	0.1253	No serial correlation problem
Heteroscedasticity Breusch-Pagan-Godfrey	0.4235	No heteroscedasticity problem
Jarque-Bera test for normality	0.0036	Model errors are not normally distributed

Based on Table 6, the results show that this model has no serial correlation as it is more than 0.05 (0.1253 > 0.05), we are unable to reject the null hypothesis of no serial correlation. Next, for the Heteroscedasticity Test, as the p-value is more than 0.05 (0.4235 > 0.05), we are unable to reject the null hypothesis of no heteroscedasticity. Thus, this model has no heteroscedasticity or that this model is homoscedasticity. As the p-value is more than 0.05, we are unable to reject the null hypothesis. So, we can conclude that the model errors are normally distributed. For the normality test, as the p-value is less than 0.05 (0.0036 < 0.05), we reject the null hypothesis. So, we can conclude that the model errors are not normally distributed.

Stability Test: To ensure the stability of the model, the CUSUM Test and CUSUM Square Test were performed for the long-run stability test.

Figure 4: Plot of Cumulative Sum of Recursive Residuals

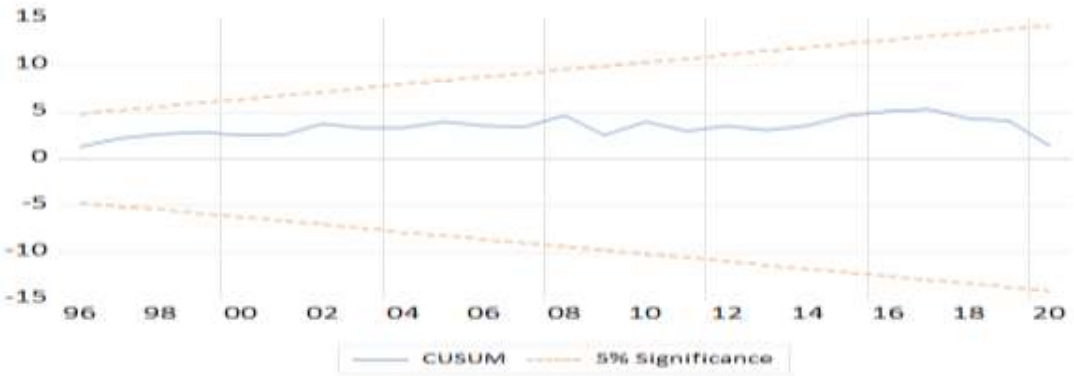


Figure 5: Plot of Cumulative Sum of Squares of Recursive Residuals

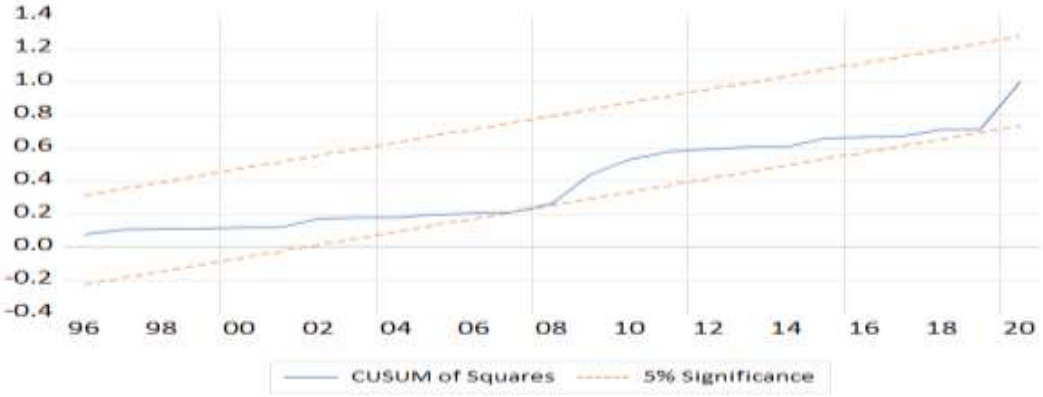


Figure 4 shows the plot of CUSUM and Figure 5 shows the plot of CUSUMQ. The CUSUM (cumulative sum) and CUSUMQ (cumulative sum of squares) from the recursive estimation of the model also indicate that the model is stable since the residuals are within the critical bounds at the 5% significance level.

Granger Causality Test: The Granger Causality test is a statistical method for determining the relationship between two time series variables. The test is based on the Granger causality concept, which states that a variable X is said to Granger-cause another variable Y if the information in X improves the prediction of Y beyond what can be achieved using only the information in Y. Below is the result of the Granger causality test.

Table 7: Granger Causality Test Results

Null Hypothesis	Obs	F-Statistic	Prob.	Decision	Conclusion
DLNGDP does not Granger Cause DLNEXC	37	0.8092	0.4541	Reject	Bidirectional causality
DLNEXC does not Granger Cause DLNGDP		1.4029	0.2606	Reject	
DLNMCAP does not Granger Cause DLNEXC	37	6.4554	0.0044	Accept	Unidirectional causality (EXC Granger cause MCAP)
DLNEXC does not Granger Cause DLNMCAP		0.1650	0.8486	Reject	
DTRADE does not Granger Cause DLEXC	37	0.4825	0.6217	Reject	Bidirectional causality
DLEXC does not Granger Cause DTRADE		0.6054	0.5520	Reject	
DLNMCAP does not Granger Cause DLNGDP	37	11.6148	0.0002	Accept	Unidirectional causality (GDP Granger cause MCAP)
DLNGDP does not Granger Cause DLNMCAP		0.4276	0.6558	Reject	
DTRADE does not Granger Cause DLNGDP	37	1.0660	0.3563	Reject	Bidirectional causality
DLNGDP does not Granger Cause DTRADE		0.3898	0.6803	Reject	
DTRADE does not Granger Cause DLNMCAP	37	0.7253	0.4920	Reject	Bidirectional causality
DLNMCAP does not Granger Cause DTRADE		0.0931	0.9114	Reject	

Based on the result in Table 7 obtained for the Granger causality test, there is a bidirectional relationship between Exchange Rates (EXC), Trade Openness (TRADE), and Economic Growth (GDP). The p-values were all more than 0.05 level of significance, thus we reject the null hypothesis. This indicates that Exchange Rates (EXC) and Trade Openness (TRADE) Granger cause Economic Growth (GDP) and vice versa. This means that there is

evidence to suggest that the past values of Exchange Rates (EXC) and Trade Openness (TRADE) do provide additional information in predicting the current value of Economic Growth (GDP). There is evidence to suggest that the past values of Economic Growth (GDP) provide additional information in predicting the current value of Exchange Rates (EXC) and Trade Openness (TRADE).

Lastly, there is a unidirectional causality between Market Capitalization (MCAP) and Economic Growth (GDP). In this case, Economic Growth (GDP) Granger causes Market Capitalization (MCAP), while Market Capitalization (MCAP) does not Granger cause Economic Growth (GDP). The p-value of MCAP Granger cause GDP is 0.6558 which is more than 0.05 level of significance (0.6558 > 0.05), thus we reject the null hypothesis. This means that there is evidence to suggest that the past values of Economic Growth (GDP) provide additional information in predicting the current value of Market Capitalization (MCAP).

Table 2 shows the stationarity results using the Unit Root Test (ADF). The MCAP, EXC, and TRADE variables are stationary at first difference or integrated of order I(1). Table 3 shows the ARDL bound test result. The result indicates that the relationship of long-run cointegration existed between the variables in the model. Table 4 shows the result of the ARDL long-run test. The result reveals that MCAP and TRADE have a positive and statistically insignificant relationship with GDP. Meanwhile, EXC has a negative and statistically significant relationship with GDP. Next, Table 5 shows the results of the short-run ECM model. The result implied the coefficient ECM for this model in the short run was a negative relationship and statistically significant. To achieve a long-run equilibrium, this model needed a 1.1-year change in deviations. Table 6 shows the result of a diagnostic test which indicates that there are no serial correlation problems and no heteroscedasticity problem and that the model errors are not normally distributed. Next, Figures 4 and 5 for the stability test showed that the model is stable since the residuals are within the critical bounds at the 5% significance level. Lastly in Table 7, there is a bidirectional relationship between EXC, TRADE, and GDP. As well as a unidirectional causality between MCAP and GDP where GDP Granger causes MCAP.

5. Conclusion and Recommendations

Conclusion: This study explored the impact of stock market development on economic growth in Malaysia and adopted the Endogenous Growth theory which many past studies have explained well about the relationship between Stock Market Development (SMD) and Economic Growth (GDP). The independent variables used in this study are Market Capitalization (MCAP) as a proxy for Stock Market Development (SMD), Exchange Rate (EXC), and Trade (TRADE). While the dependent variable is Economic Growth (GDP). Using a time series of 40 years of data (1981 to 2020), this study used the Autoregressive distributed lag (ARDL) method and Granger causality test to obtain the results. The result of the ARDL long-run test suggested that Stock Market Development (SMD) and Trade Openness (TRADE) have a positive and statistically insignificant relationship with Economic Growth (GDP). Meanwhile, Exchange Rates (EXC) have a negative and statistically significant relationship with Economic Growth (GDP). The results of the short-run ECM model suggested that the model in this study is a negative relationship and statistically significant where to achieve a long-run equilibrium, this model needed a 1.1-year change in deviations. The negative estimate indicates that the long-run equilibrium can be achieved. Lastly, the result of the Granger causality test suggested that there is a bidirectional relationship between Exchange Rates (EXC), Trade Openness (TRADE), and Economic Growth (GDP). As well as there is also a unidirectional causality between Stock Market Development (SMD) and Economic Growth (GDP) where Economic Growth (GDP) Granger causes Stock Market Development (SMD).

Suggestions and Policy Implication: The relationship between stock market development and economic growth is generally regarded as positive, implying that a well-developed stock market can both support and promote economic growth. Although this model is unable to prove that there is an impact between stock market development on economic growth, the sign of the coefficient, in the long run, turns out to be positive. Hence, the government should take necessary steps to improve the stock market development to promote economic growth. A well-functioning stock market provides businesses with long-term financing, allowing them to invest in new projects, expand operations, and create jobs. This, in turn, has the potential to boost economic growth. The Malaysian government should improve market regulation by making sure the stock market is well-regulated and transparent can help to boost investor confidence and increase market investment. This can be accomplished by strengthening market surveillance and enforcement mechanisms, increasing disclosure and

transparency requirements, and holding market participants accountable for any wrongdoings. Furthermore, a well-developed stock market can improve individuals' and households' access to capital, allowing them to invest in the stock market and potentially increase their wealth.

This can result in increased consumer spending and a boost to the economy. This model suggests that exchange rates have a negative and statistically significant relationship with economic growth. A negative relationship between exchange rates and economic growth can occur when a country's currency depreciates, making imports more expensive. This can result in inflation, reducing consumer purchasing power and potentially slowing economic growth. A weaker currency may also discourage foreign investment, reducing economic growth. Hence, the government must take proper action to increase the exchange rates in Malaysia. By implementing a monetary policy, the Malaysian central bank can adjust monetary policy to influence the exchange rate. Raising interest rates, for example, can increase demand for the Malaysian ringgit, causing the currency to strengthen. To increase the exchange rates in Malaysia, the Malaysian government should encourage trade openness with other countries and increase exports, which can help the ringgit's demand. This can be accomplished by lowering trade barriers, negotiating free trade agreements, and marketing the country as a good place to invest.

Limitations and Directions for Future Research: This study has had limited access to the information on the data of a variable namely market capitalization. The data is only available up until 2020. It is disappointing that this research could not obtain up-to-date data to be used in the regression. Hoping in the future the data can be updated frequently and up to date, so that, for future research, researchers can use up-to-date data to publish an up-to-date paper. Next, this study may have not captured other factors that influence economic growth, but future research should include other variables that could also be the factors that influence economic growth. It is important to look into these other variables as they can comprehensively understand how economic growth can be influenced. This research may include examining a broader range of elements such as the impact of social progress and technological advances on economic growth. Additionally, researchers should consider exploring emerging markets and economies to truly understand how economic growth is affected by different trends. By including this other variable that could also be the factor that influences economic growth, researchers will be able to gain a better perspective into the overall impact of economic growth on future generations.

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Circular Supply Chain Management in Developing Countries: Challenges, Opportunities and Pathways to Sustainability

Fadhlur Rahim Azmi[1*], Mastura Roni[1] & Megawati Sa'at[2]
[1]Faculty of Business & Management, Universiti Teknologi MARA, Cawangan Melaka Kampus Bandaraya Melaka, Malaysia
[2]Faculty of Technology Management and Technopreneurship, Universiti Teknikal Malaysia Melaka, Malaysia
fadhlur@uitm.edu.my

Abstract: This paper offers a comprehensive exploration of circular supply chain management (CSCM) in the context of developing countries, unveiling a multifaceted landscape of challenges, opportunities, strategies and future prospects. Challenges facing these nations in embracing CSCM include a lack of waste infrastructure, limited awareness and education, financial constraints, a shortage of technical expertise, barriers to accessing global markets, and a dearth of data and information. These challenges underscore the need for tailored, context-specific solutions to establish a robust foundation for CSCM. The study looks ahead and predicts that soon there will be more circular business models, less waste management and more resource optimization, more local circular ecosystems, and more streamlined circular supply chains. Technological advancements, such as blockchain, the Internet of Things (IoT) and data analytics, are poised to revolutionize CSCM. Increased global awareness of environmental issues and sustainability will be a driving force for change, with academia, businesses, and governments playing pivotal roles in shaping this future. This paper emphasizes the pivotal role of CSCM in advancing sustainable development, both in developing countries and globally. It underscores the critical importance of a steadfast commitment to sustainability, circularity, and responsible resource management for the future of these nations and the entire planet.

Keywords: *Circular Supply Chain Management (CSCM), Developing Countries, Waste Infrastructure, Sustainability, Circular Business Models*.

1. Introduction

The circular economy concept represents a departure from the traditional linear "take-make-dispose" model of production and consumption. It seeks to redefine economic growth by prioritizing resource efficiency, minimizing waste, and promoting materials' continual use and regeneration (Ogunmakinde, Egbelakin, & Sher, 2022). This approach aligns closely with sustainability goals, aiming to decouple economic growth from resource depletion and environmental degradation. In a circular economy, products and materials are designed to be used, repaired, remanufactured, and eventually recycled, creating a closed-loop system that reduces the need for virgin resources and minimizes the generation of waste (Kara et al., 2022; Mishra et al., 2023) This approach not only reduces the environmental impact of production and consumption but also presents economic opportunities through innovation, job creation, and reduced reliance on raw materials (Maiurova et al., 2022; Kurniawan et al., 2022). Circular Supply Chain Management (CSCM) stands as a pivotal strategy in the pursuit of achieving the Sustainable Development Goals (SDGs) and addressing the pressing environmental challenges that confront societies worldwide (Luthra et al., 2022). The concept of CSCM, deeply rooted in circular economy principles, resonates profoundly with the objectives outlined by the United Nations' SDGs.

These goals encompass a comprehensive framework for sustainable development that includes environmental protection, economic growth, and social well-being. CSCM aligns directly with several of these goals, notably SDG 12 (responsible consumption and production), SDG 8 (decent work and economic growth), and SDG 9 (industry, innovation, and infrastructure). By prioritizing resource efficiency, waste reduction, and sustainable practices throughout the supply chain, CSCM contributes to attaining these pivotal global objectives. A primary focal point is SDG 12, which underscores the importance of responsible consumption and production patterns. CSCM champions the creation of products designed for longevity, repairability, and recyclability, thereby curtailing the rampant cycle of waste accumulation associated with linear production models. This shift towards circularity not only decreases the environmental burden imposed by excessive waste but also ensures a more sustainable utilization of finite resources. CSCM emphasizes the transformation of product design, manufacturing, and consumption practices, thereby reducing the strain on ecosystems and promoting more sustainable use of materials (Nayal et al., 2022).

Moreover, the connection between CSCM and SDG 8, concerning decent work and economic growth, is noteworthy. Developing economies often grapple with limited job opportunities and sustainable economic avenues (Toker & Görener, 2023). CSCM introduces avenues for employment generation, particularly in the repair, refurbishment, and recycling sectors. These economic opportunities not only bolster local economies but also foster a more inclusive form of economic growth that aligns with the principles of sustainable development (Bai & Li, 2023). Furthermore, CSCM resonates with the essence of SDG 9, focusing on industry, innovation, and infrastructure. By encouraging the redesign of products for circularity, CSCM stimulates innovation across sectors, leading to the creation of novel business models, technologies, and practices that reduce waste and conserve resources (Ghosh, Bhola, & Sivarajah, 2022). This transition to circular practices fosters the growth of sustainable industries and advances technological innovation, which is paramount for both economic progress and environmental protection. In essence, the significance of CSCM in addressing environmental challenges is profound (Tseng et al., 2023). It directly mitigates waste generation, conserves resources, contributes to climate change mitigation, and promotes biodiversity conservation (Aithal & Aithal, 2023). The transformative potential of CSCM is poised to shape more sustainable consumption and production patterns, aligning with the broader objectives of the circular economy (Bocken, Niessen, & Short, 2022).

The core purpose of this paper is to undertake a comprehensive exploration of the landscape of CSCM within the specific context of developing countries. By delving into the status, challenges, and potential pathways for implementing CSCM, this paper aims to provide a holistic understanding of the intricate interplay between circular economy principles and the unique dynamics characterizing developing economies. By unravelling the complexities inherent in reshaping supply chains into circular paradigms, the paper endeavors to unravel how developing countries can harness the principles of CSCM to simultaneously drive sustainable economic growth and address environmental imperatives. Furthermore, by identifying the specific hurdles encountered in these contexts, the study aspires to contribute to the development of tailored strategies that can navigate the challenges posed by limited resources, cultural factors, and infrastructural constraints. In essence, this paper endeavors to go beyond theoretical discourse by offering a practical roadmap that can guide policymakers, businesses, and stakeholders in developing countries toward effective CSCM adoption. By unravelling the intricate web of challenges and opportunities, this research seeks to facilitate a comprehensive dialogue on the role of CSCM in steering developing countries towards sustainable development trajectories, underscoring its significance in achieving the dual objectives of economic advancement and environmental preservation.

2. Challenges in Circular Supply Chain Management in Developing Countries

CSCM practices in developing countries present a unique set of challenges that stem from a combination of resource constraints, infrastructural limitations, socio-economic factors, and cultural considerations. These challenges, while intricate and multifaceted, underscore the need for tailored strategies to effectively transition to circular economies.

Limited Waste Infrastructure: The absence of robust waste management infrastructure undermines the fundamental principles of circularity by impeding the smooth flow of materials through the supply chain (Ding, Wang, & Zou, 2023). Inadequate waste collection systems result in the improper disposal of potentially recyclable materials, contributing to environmental degradation and resource depletion. Without the capacity to effectively separate, recover, and process recyclable materials, developing countries are unable to capitalize on the inherent value of these resources (Tseng et al., 2023). This challenge is particularly pronounced in the context of the circular economy, where the efficient retrieval and reintroduction of materials into the production cycle are paramount. A well-functioning circular system hinges on the ability to reclaim materials from end-of-life products, a process greatly hindered by the absence of proper waste infrastructure (Venkatachalam et al., 2022). Addressing this challenge demands a multifaceted approach involving policy interventions, investment in waste management technologies, and community engagement. Governments must prioritize the development of waste management policies that encourage recycling and incentivize responsible disposal practices. Simultaneously, targeted investments in waste collection, sorting, and recycling technologies are crucial to establishing the necessary infrastructure for effective CSCM (Sopha, Purnamasari, & Ma'mun, 2022).

Lack of Awareness and Education: Promoting circular consumption patterns through effective awareness and education campaigns stands as a pivotal challenge in the context of developing countries (Sarker, Ghosh, & Islam, 2022). Thus, encouraging a shift in consumer behavior and attitudes toward circularity presents multifaceted obstacles that underscore the importance of tailored educational initiatives (Lopes, Gomes, & Trancoso, 2023). Developing countries often contend with deeply entrenched consumption patterns that prioritize disposability and novelty. Convincing consumers to adopt more sustainable practices, such as reusing and recycling products, necessitates a comprehensive understanding of local contexts and preferences (Suphasomboon & Vassanadumrongdee, 2023). This challenge is particularly pertinent due to the diverse socio-cultural dynamics prevalent in these regions. Raising awareness about the benefits of circular consumption emerges as a critical strategy to catalyze behavioral change. In the absence of such awareness, the inherent advantages of circular practices, including reduced resource consumption and environmental impact, remain elusive to consumers (Ncube, et al., 2023).

Targeted educational campaigns are instrumental in conveying these benefits to local communities and resonating with their values and aspirations. The effectiveness of awareness campaigns lies in their ability to connect with consumers on a personal level. Tailored messaging, culturally sensitive communication, and relatable examples can bridge the gap between theoretical concepts and actionable behaviors (Duong & Hopfer, 2023). For instance, a campaign that emphasizes how circular consumption can contribute to local employment and community development might be more compelling in certain contexts. Successfully navigating this challenge requires collaboration between governments, civil society organizations, and businesses. Government-led initiatives can drive policy changes that support circular practices, while businesses can play a pivotal role by incorporating circular principles into their branding and marketing strategies (Danvers, Robertson, & Zutshi, 2023). Collaborative efforts can also leverage local influencers and community leaders to enhance the credibility and resonance of awareness campaigns.

Financial Constraints: Developing countries, grappling with economic challenges, often find it difficult to allocate the required funding for the implementation and scaling of CSCM practices (Dulia, Ali, Garshasbi, & Kabir, 2021). The need to revamp supply chain processes, adopt innovative technologies, and train personnel to operate within circular systems demands a level of investment that may exceed available budgets (Trevisan et al., 2023). This financial obstacle obstructs the potential benefits that CSCM can bring, such as reduced resource consumption and enhanced economic resilience. Addressing financial constraints requires a multi-pronged approach that involves collaboration between stakeholders. International organizations, governments, and private sector entities can play crucial roles in providing financial support, technical expertise, and capacity-building initiatives. Such collaborations can mitigate the burden of financial constraints and accelerate the transition towards CSCM. Moreover, the potential economic gains from adopting circular practices, such as job creation in the repair and recycling sectors, underscore the notion that the initial investments can yield long-term economic benefits (Molla et al., 2022). While financial limitations present challenges, they also emphasize the importance of strategic planning and prioritization. Developing countries must strategically allocate available resources, focusing on initiatives that offer the highest potential for impact. This strategic approach can help overcome financial hurdles by optimizing resource utilization and targeting areas that align with broader sustainability and economic development objectives.

Technical Expertise Gap: To effectively design, manage, and optimize circular supply chains, a deep understanding of processes related to material recovery, refurbishment, and remanufacturing is indispensable (Amir et al., 2023; Chen, Feng, & Soto, 2022). However, in many developing countries, the necessary technical expertise is often limited or absent. This knowledge gap can obstruct efforts to transition from linear to circular models, as the lack of expertise affects both strategic decision-making and practical implementation (Shang, Saeidi, & Goh, 2022). Developing countries can leverage international partnerships to access expertise from countries with advanced circular economies, enabling knowledge transfer and capacity-building. Furthermore, local innovation and entrepreneurship can emerge as solutions to bridge the technical expertise gap (Leckel, Veilleux, & Dana, 2020). Communities often innovate out of necessity, leading to the development of localized circular solutions that cater to specific challenges and contexts (Suchek et al., 2021; Brown, Bocken, & Balkenende, 2019). Support for grassroots initiatives and start-ups can catalyze the development of local expertise, fostering a self-sustaining ecosystem of circular practitioners. While overcoming the technical expertise gap is undoubtedly challenging, the potential benefits are vast. Equipping developing countries with

the knowledge and skills needed for efficient CSCM practices can lead to increased resource efficiency, reduced environmental impact, and enhanced economic resilience (Ozkan-Ozen, Kazancoglu, & Mangla, 2020).

Access to Markets: Quality standards and product certification are critical components of international trade. Circular products must adhere to stringent quality benchmarks to gain acceptance in global markets (Wang, Burke, & Zhang, 2022). Developing countries, often in the early stages of embracing circular practices, may struggle to meet these standards, hindering their ability to participate in international trade networks. Trade barriers further exacerbate the challenge. Tariffs, quotas, and regulatory requirements can create obstacles that disproportionately affect developing countries seeking to export circular products (Holtman, Aguiar, & Devadoss, 2022). The intricate web of trade regulations can impede the smooth flow of goods, making it difficult for these countries to capitalize on their circular initiatives. To address this challenge, developing countries require a multi-pronged approach. Collaborative efforts between governments, businesses, and international organizations are essential to advocate for fair trade policies that consider the unique circumstances of circular economies. Moreover, investing in capacity-building programs to enhance product quality and certification processes is crucial to bridge the gap between local circular practices and global market requirements (Borrello et al., 2023). Strategies should also encompass the development of partnerships that facilitate access to markets (Armitage et al., 2020). Collaborative initiatives that involve international organizations, local enterprises, and trade associations can collectively advocate for streamlined trade processes, while also assisting developing countries in meeting quality standards and obtaining certifications.

Data and Information Gap: The data and information gap further complicates the formulation of evidence-based policies and strategies. Informed decision-making requires a reliable foundation of data that reflects the intricate dynamics of supply chains and their environmental impacts. The absence of such data can hinder the development of targeted interventions, potentially delaying progress toward circular practices (Awan, Sroufe, & Shahbaz, 2021). Addressing this challenge calls for concerted efforts to enhance data collection, management, and sharing mechanisms. Governments, in collaboration with international organizations, can invest in building data infrastructure that captures material flows and environmental impacts accurately (Bibri & Krogstie, 2020). Public-private partnerships can also play a pivotal role in promoting transparency and data sharing across supply chains. Moreover, capacity-building initiatives are crucial for empowering local stakeholders to collect and interpret data effectively. Workshops, training programs, and knowledge-sharing platforms can elevate the data literacy of individuals involved in supply chain management, enabling them to gather and leverage data for informed decision-making.

3. Opportunities and Initiatives

CSCM offers a range of promising opportunities and initiatives for developing countries to embrace sustainable practices, drive economic growth, and address pressing environmental challenges. By strategically leveraging these avenues, these nations can create a positive impact while aligning with the principles of the circular economy.

Policy and Regulatory Frameworks: In the realm of CSCM, robust policy and regulatory frameworks stand out as a fundamental strategy for developing countries aiming to transition to more sustainable and circular economies (Maguire & Robson, 2023). These frameworks offer a structured approach to reshaping supply chain practices, aligning business incentives with environmental objectives, and fostering a conducive environment for circularity. Key within these frameworks are Extended Producer Responsibility (EPR) programs, placing the responsibility on manufacturers to manage their products' entire lifecycle, from creation to disposal. EPR incentivizes producers to design products for easier recycling and disassembly, catalyzing circularity (Stumpf, Schöggl, & Baumgartner, 2021). This shift in economic incentives from linear to circular business models enhances resource efficiency and reduces waste generation. Additionally, policy mechanisms that provide incentives for circular practices hold significant potential. By offering tax benefits, subsidies, grants, and reduced import duties, developing countries encourage businesses to adopt sustainable supply chain approaches (Zhou, et al., 2024). These incentives alleviate financial burdens associated with circular processes, stimulating activities like recycling, remanufacturing, and refurbishment.

This approach not only drives economic growth but also contributes to waste reduction and resource conservation (Razzaq et al., 2021). Successful CSCM policies extend beyond isolated initiatives, integrating circular economy principles into national development strategies (Berardi & Brito, 2021). By infusing circularity into broader economic planning, governments drive a systemic shift towards sustainable practices. This involves crafting long-term roadmaps prioritizing circular design, resource efficiency, and waste reduction (Razzaq et al., 2021). Such integration attracts international investment, enhances domestic innovation, and positions developing countries as sustainability leaders. To conclude, policy and regulatory frameworks play a pivotal role in shaping the trajectory of CSCM in developing countries. Through the implementation of EPR programs, incentivizing circular practices, and integrating circular economy principles into national agendas, these frameworks provide the necessary structure for businesses, industries, and governments to collaboratively transition towards circular supply chains. This holistic approach fosters economic growth while mitigating environmental impacts, contributing to a more sustainable and resilient future.

Local Innovation: Local innovation serves as a dynamic catalyst for advancing CSCM practices in developing countries. By tapping into the creative potential of communities, these nations can reshape their approach to waste, unleashing inventive strategies for upcycling, repair, and community-based recycling. Upcycling, a prominent facet of local innovation, involves reimagining discarded materials as valuable resources (Reddy, et al., 2023). This approach gains traction in developing countries, where materials are repurposed to divert waste from landfills. Examples include fashion items made from reclaimed fabrics, furniture crafted from salvaged wood, and decorative pieces from discarded glass (Crini et al., 2020). Beyond prolonging material lifecycles, such practices also stimulate local economies by fostering markets for upcycled products. In tandem with upcycling, the repair ethos thrives as a sustainability pillar in CSCM. Developing countries champion repair cultures through initiatives like repair cafés and community workshops. Empowering individuals to mend items that would otherwise be discarded, these efforts extend to electronics, appliances, clothing, and accessories (Moalem & Mosgaard, 2021).

The outcomes include waste reduction, resource conservation, and the cultivation of valuable skills within communities, bolstering local economies and employment prospects. Community-based recycling initiatives further underscore the influence of local innovation. Navigating resource constraints, these solutions hinge on communal collaboration. By mobilizing communities to collect, sort, and process recyclable materials, these initiatives create virtuous cycles of conservation and engagement (Nolasco, et al., 2021). Local buy-back programs, waste separation incentives, and responsible disposal practices foster both environmental consciousness and a sense of ownership, addressing waste management challenges. In essence, local innovation drives the advancement of CSCM in developing countries. Through imaginative practices in upcycling, repair, and community-based recycling, these nations convert waste into valuable assets, nurturing sustainable habits and enriching communities. Celebrating and amplifying these innovative solutions chart a path toward more sustainable, circular economies that serve the well-being of people and the planet.

Collaborative Partnerships: Collaborative partnerships stand as a linchpin in advancing CSCM practices, particularly within the context of developing countries where the journey towards circular economies is fraught with unique challenges and opportunities. These partnerships represent a harmonious convergence of efforts from various stakeholders - governments, businesses, non-governmental organizations (Lv & Shang, 2023), and international entities - each bringing their distinct strengths and perspectives to the forefront, collectively steering the course toward sustainable and circular supply chains (Dagilienė, Varaniūtė, & Bruneckienė, 2021). In the realm of CSCM, the synergy between governments and businesses assumes paramount importance. Such collaborations play a pivotal role in sculpting the policy landscapes that underpin CSCM initiatives. Governments, as catalysts of change, can engineer an enabling environment by formulating regulations and incentives that stimulate circular practices (Kazancoglu, Sagnak, & Mangla, 2021). These endeavors often involve extensive dialogues with industry stakeholders, fostering cooperative policymaking that strikes a delicate balance between environmental responsibility and economic viability.

An illustrative example lies in governments mandating the use of recycled materials in products, thereby incentivizing businesses to embrace circular strategies while staying aligned with evolving sustainability standards (Iacovidou, Hahladakis, & Purnell, 2021). Furthermore, partnerships between non-governmental organizations and businesses bridge the divide between societal and commercial interests, rendering them

crucial in the CSCM landscape. Such alliances engender initiatives that raise awareness about the merits of circular consumption (Liu et al., 2020). Collaborative campaigns educate consumers on recycling practices, eco-friendly products, and the profound significance of supporting circular supply chains. Beyond cultivating sustainable behaviors, these alliances bolster the corporate reputation of businesses as socially responsible entities, nurturing positive relationships within communities and engendering a shared sense of responsibility. Moreover, international organizations serve as catalysts, amplifying the impact of CSCM initiatives through cross-border collaborations. These entities provide platforms that facilitate the exchange of knowledge, the dissemination of best practices, and the implementation of capacity-building programs.

Partnerships that span borders, often between developing countries and international organizations, result in collaborative projects aimed at tackling shared challenges like waste management and resource scarcity (Ul-Durar et al., 2023). These collaborations harness the collective expertise and resources of multiple nations, yielding solutions that transcend geographical boundaries and expedite the transition towards circular economies. Lastly, within the private sector, collaborations assume a pivotal role in driving the adoption of CSCM practices, fostering innovation, and elevating sustainability standards (Du, Bstieler, & Yalcinkaya, 2022). Businesses operating within the same industry often unite their forces to create closed-loop supply chains (Kazancoglu et al., 2022). In these partnerships, resources, expertise, and best practices are shared.

These alliances extend beyond mere competition, promoting advancements across the entire industry in areas like recycling, remanufacturing, and waste reduction (Holzer et al., 2022). By conferring competitive advantages and reducing operational costs, they collectively propel the sector towards circularity and responsible practices. Thus, collaborative partnerships, operating within the milieu of CSCM, represent indispensable agents of transformation for establishing sustainable and circular supply chains, especially in developing countries (Cerqueira-Streit et al., 2021). Through the amalgamation of efforts by governments, businesses, NGOs, and international organizations, these partnerships lay the foundational groundwork for a future marked by resilience, resource efficiency, and sustainability. By fostering cooperative policymaking, orchestrating awareness campaigns, facilitating cross-border cooperation, and forging industry alliances, they empower stakeholders to collectively steer the trajectory towards circular economies, ushering in a greener and more sustainable world (Kumar et al., 2023).

4. Strategies for Promoting Circular Supply Chain Management

In the context of developing countries, where resource constraints and waste management issues are often acute, promoting CSCM becomes especially crucial. To foster the adoption of CSCM in these regions, a multifaceted approach involving capacity building, incentives, education, policy recommendations, and international partnerships is essential. One of the first steps towards embracing CSCM in developing countries is to invest in capacity building. This involves training programs, knowledge sharing, and skill development to cultivate a local pool of experts (Ashok et al., 2021). By empowering individuals and organizations with the requisite knowledge and skills, countries can harness their internal capabilities to implement CSCM effectively (Ghana Urbanisation Think Tank, 2019). Capacity building extends beyond theoretical education; it encompasses hands-on training in areas such as material recovery, remanufacturing, and reverse logistics. These skills are vital for ensuring the efficient flow of materials within a circular economy. To catalyze the transition towards CSCM, it's essential to identify strategies for attracting investment in circular infrastructure. Developing countries often face financial limitations, which can hinder the adoption of circular practices (Mishra, Chiwenga, & Ali, 2021).

As a solution, incentives and financing mechanisms can be employed to incentivize businesses and investors to participate in the circular economy. Tax benefits, subsidies, grants, and reduced import duties for companies embracing sustainable supply chain approaches can reduce the financial burden. Additionally, innovative financing models, such as green bonds or impact investment, can mobilize funds specifically for circular infrastructure development. Promoting CSCM requires changing consumer behavior and fostering a culture of circular consumption (Farooque et al., 2019). Education and awareness campaigns are crucial to this endeavor. These campaigns need to resonate with local communities, highlighting the benefits of reusing, recycling, and reducing waste. The message should extend beyond environmental aspects to encompass economic and social advantages (Raza et al., 2021). By demonstrating that circular practices can create jobs, stimulate local

economies, and conserve resources, education and awareness campaigns encourage consumers to make more sustainable choices. Developing countries often face distinct challenges in implementing CSCM, and these challenges necessitate customized policy frameworks. One-size-fits-all policies may not be effective in regions with different socioeconomic, infrastructural, and cultural contexts (Esposito et al., 2021).

Tailoring policy recommendations to suit the unique needs of developing countries is essential. Governments should focus on regulations that drive the adoption of recycling and remanufacturing practices while considering local economic and industrial dynamics. They should also aim to foster innovation and provide incentives for businesses to design products with circularity in mind. International collaborations can significantly enhance the promotion of CSCM in developing countries. By leveraging international partnerships, nations can access expertise, resources, and best practices. Collaborations with governments, businesses, NGOs, and international organizations can facilitate knowledge-sharing and capacity-building programs. These partnerships can lead to joint projects that address common challenges, such as waste management and resource scarcity. The exchange of experiences and solutions can help accelerate the adoption of CSCM by drawing on the global community's collective knowledge and resources.

Future Outlook: There are several anticipated trends and developments that characterize the CSCM future outlook in developing nations. These nations are expected to witness a surge in circular business models, with companies increasingly embracing practices like remanufacturing and designing products for recyclability. This shift will not only reduce waste but also stimulate local economic growth by creating jobs and new markets. Furthermore, there will be a paradigm shift in how waste is perceived, with it being recognized as a valuable resource that can be repurposed, recycled, and upcycled, contributing to more sustainable economies. Local circular ecosystems, involving a diverse range of stakeholders, will flourish, optimizing material flows, reducing waste, and fostering innovation (Nogueira, Ashton, & Teixeira, 2019). Modern technology that improves the supply chain will lead to more environmentally friendly logistics. For example, real-time tracking and circular material flows will help cut down on pollution from transportation and waste. Technological advancements will be pivotal in shaping the future of CSCM. Blockchain technology will ensure transparency, traceability, and accountability in supply chains, enhancing consumer trust (Cao, et al., 2021). The Internet of Things (IoT) will provide real-time data on product conditions and locations, leading to more efficient supply chain monitoring and waste reduction (Bhutta & Ahmad, 2021). Artificial intelligence and data analytics will optimize processes and identify opportunities for further waste reduction (Benzidia, Makaoui, & Bentahar, 2021). Moreover, increasing global awareness of environmental issues and sustainability will drive change.

Consumers will demand eco-friendly products and transparent supply chains, compelling businesses to adopt circular practices. Global initiatives and agreements will exert pressure on governments and corporations to embrace circularity and reduce their environmental footprint. The roles of academia, businesses, and governments will be pivotal in shaping the future of CSCM. Educational institutions will prepare the workforce for CSCM by tailoring curricula to equip students with the knowledge and skills necessary for circular practices. They will also contribute to research and innovation, driving the development of new circular technologies and best practices. Due to consumer demands and the pursuit of increased profitability, businesses will remain at the forefront of this transformation. They will invest in research and development, engage in collaborations to optimize circular supply chains, and implement innovative technologies (Sehnem et al., 2019). Governments will create the regulatory framework for CSCM, fostering an environment where circular practices can thrive. Policies, incentives, and international cooperation will play crucial roles in enabling the transition towards more sustainable and circular supply chains in developing countries. In summation, the future of CSCM in developing nations holds immense promise, with evolving trends, technological advancements, and heightened global awareness driving the adoption of circular practices and academia, businesses, and governments collectively shaping a more sustainable future.

5. Conclusion and Recommendations

In this comprehensive exploration of CSCM in developing countries, we have uncovered a complex landscape characterized by challenges, opportunities, strategies, and a promising future. This conclusion recaps essential insights from the article, highlighting the crucial role of CSCM in advancing sustainable development in these regions. It also serves as a resounding call to action for stakeholders, including governments, businesses,

academia, and international organizations, to continue fostering circular practices and collaborations. CSCM is especially hard in developing countries because they do not have enough waste infrastructure, people are not educated or aware of the problems, they do not have enough money, they cannot get to markets easily, and they do not have enough data and information. All of these things make it harder for people to adopt circular practices. These barriers underscore the necessity for tailored solutions that consider local realities and provide a robust foundation for CSCM in these nations. Amid these challenges, some significant opportunities and initiatives offer hope for progress. Robust policy and regulatory frameworks, local innovation in upcycling and repair, collaborative partnerships between governments, businesses, NGOs, and international organizations, and the adoption of cutting-edge technologies all play pivotal roles in advancing CSCM.

These initiatives demonstrate that with concerted effort, it is possible to overcome barriers and pave the way toward the adoption of circular supply chains. To drive the adoption of CSCM in developing countries, stakeholders must implement a multifaceted strategy. Capacity building through knowledge sharing and training programs is essential to develop local expertise. Incentives and financing mechanisms should be devised to attract investments in circular infrastructure. Education and awareness campaigns are vital for changing consumer behavior and fostering a culture of circular consumption. Policymakers should tailor frameworks to meet the unique needs of developing countries, and international partnerships must be strengthened to access expertise and resources. Looking to the future, several trends and developments in CSCM for developing countries become apparent. These include the emergence of circular business models, a shift from waste management to resource utilization, the growth of local circular ecosystems, and the optimization of circular supply chains. Technological advancements, including blockchain, IoT, and data analytics, are set to revolutionize CSCM. Additionally, increasing global awareness of environmental issues and sustainability will drive change. Academia, businesses, and governments will play pivotal roles in shaping this future, fostering sustainability and environmental responsibility. The significance of CSCM for sustainable development in developing countries cannot be overstated.

Circular practices effectively address critical challenges like waste management, resource scarcity, and environmental degradation. They offer the potential to rejuvenate local economies, create jobs, and reduce the environmental footprint. CSCM is a catalyst for sustainable development, offering a path toward resilience and prosperity. It not only mitigates the challenges posed by linear supply chains but also positions developing countries as leaders in sustainable and circular development. Governments must craft policies and regulations that facilitate CSCM, taking into account the unique context of their nations. Businesses must adopt circular practices as a strategic imperative, investing in innovation and sustainability. Academia must continue to educate and empower the workforce with the skills and knowledge required for CSCM. International organizations and NGOs must strengthen partnerships to provide support, expertise, and resources to developing countries. The responsibility falls on all stakeholders to continue fostering circular practices and collaborations. It is only through collective and concerted efforts that the challenges posed by linear supply chains can be surmounted. The future of developing countries and the planet as a whole hinges on a commitment to sustainability, circularity, and responsible resource management. As we navigate the path to a more sustainable and circular future, the role of CSCM becomes increasingly pivotal, offering a beacon of hope and serving as a transformative force for the betterment of our world.

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Successful Leadership Styles from the Lense of Qualitative Perspective: A Conceptual Visit

Nur Hidayah Hud[1], *Ahmad Fadhly Arham[2] & Zulkefli Muhamad Hanapiyah[2]
[1]Insitute of Postgraduate Studies, Faculty of Business & Management, Universiti Teknologi MARA, Melaka, Malaysia
[2]Behavioural and Leadership Development Studies, Faculty of Business & Management, Universiti Teknologi MARA, Melaka, Malaysia
*ahmad490@uitm.edu.my

Abstract: This paper explores the relevancy of transformational and servant leadership styles in Small and Medium Enterprises (SMEs) in Malaysia. The topic of leadership has been studied extensively throughout the years, with various leadership theories have been proposed. Previous studies have also highlighted on how leadership style is crucial in influencing the performance of an organization. Moreover, these two well-known leadership styles are believed to sit well with the concepts and strategies practiced among SMEs in this country. This study seeks to offer literature and practical insights into why these two styles of leadership are relevant and practical for the distinctive circumstances of Malaysian SMEs. Therefore, the researcher concluded with a rationale that applying the right and suitable leadership styles will influence the performance and success of Malaysian SMEs in the future.

Keywords: *Leadership; transformational leadership; servant leadership; SME performance; Malaysia.*

1. Introduction

Small and Medium-sized Enterprises (SMEs) form the backbone of Malaysia's economic landscape, constituting a diverse and dynamic sector that significantly contributes to the nation's economic development (Mohamad et al., 2021). These enterprises, which differ in terms of their size, scope and industry, have a vital role in promoting entrepreneurship, driving innovation, and providing substantial employment opportunities across the country. As of the latest available data from the Department of Statistics Malaysia, SMEs make up over 98% of business establishments in the country (Official Website of SME Corporation Malaysia, 2022). These enterprises play a crucial role in employment generation, innovation and economic resilience. As engines of economic growth, Malaysian SMEs face a unique set of challenges and opportunities shaped by evolving market dynamics, technological advancements and global economic trends (Mohamad et al., 2021). In the face of a fast-changing global economy, Malaysia must address the difficulties by implementing effective leadership techniques to ensure the success and sustainability of SMEs (Howard et al., 2019). In the context of SMEs in Malaysia, the role of leadership styles is crucial in shaping the direction of these businesses.

It was supported by the finding from Franco & Matos (2015) that leadership styles that emphasize adaptability, innovation and employee development are crucial for SMEs to thrive in a competitive business environment. Also, effective leadership behavior is crucial for achieving optimal organizational performance and mitigating the risk of organizational failures (Priadana et al., 2021). Earlier, Matzler et al. (2008) highlighted that transformational leadership was an appropriate approach to managing the firm, measuring the positive impacts on innovation, growth and profitability in there. Simultaneously, servant leadership, which prioritizes the welfare of team members and society, aligns with the ethical considerations valued in Malaysian business culture (Spears, 2005). Looking into the existing research on leadership styles on organizational performance, much of that previous research has been conducted quantitatively, even in the context of Malaysia (Tian et al., 2020; Rasheed et al., 2021; Rose & Mamabolo, 2019; Hisham et al., 2020; Ng, 2019; Suhartanti & Prasetyanto, 2022). However, Ragaisis (2018) has suggested a qualitative approach to studying leadership. The qualitative approach to studying leadership could fill in the inconsistencies that had occurred among the previous quantitative studies. Therefore, this paper is undertaken to explore and discover the successful leadership styles practiced by the owners or leaders of SMEs in Malaysia that have a crucial influence on the performance of these businesses.

2. Literature Review

Different Perspectives of Definition of Leadership: Many previous researchers have studied the definitions of leadership when conducting their studies. Bass (1990) explained leadership as a dynamic connection between many persons within a group, involving the organization or reorganization of the context and the members' views and expectations. Along with this definition, leaders are regarded as change agents – individuals whose conduct has a greater impact on others than it does on themselves. Yukl (2012) defined leadership as the process of encouraging people to comprehend and concur on what must be done and how to do it, while also facilitating individual and group efforts to achieve shared objectives. In general, the concept of leadership encompasses the ability to resolve challenges, motivate and inspire individuals, and inspire them to reach their full potential in the pursuit of organizational goals (Peleg, 2012). Meanwhile, in the context of Malaysia, leadership is how an individual behaves and takes activities to motivate, stimulate, and encourage a group of persons to accomplish organizational objectives (Arham, 2014). Also, Voon et al. (2011) in their study characterized leadership as a process of influence between leaders and subordinates, in which a leader attempts to influence the behavior of subordinates to accomplish organizational objectives. Additionally, they emphasized that worker commitment, job satisfaction, and output can be enhanced through the implementation of effective leadership styles.

Emerging Theories of Leadership: Leadership has become an increasingly significant concept in the contemporary globalized world, having been the subject of extensive scholarly investigation due to its complex and multifaceted nature (Benmira & Agboola, 2021). Therefore, previous researchers had proposed many different theories on leadership in those periods. The establishment of effective leadership is complicated, and it has evolved over the centuries influenced by many factors (Sharkawi et al., 2016). In a study conducted by Benmira & Agboola (2021), those leadership theories were categorized into four main eras: trait, behavioral, situational and new leadership. The overview of the preferred leadership theories is in Table 1 below:

Table 1: Overview of the Preferred Theories of Leadership

Era	Period	Theory	Description
Trait	1840s	Great Man	Concentrate on leaders produced naturally
	1930s-1940s	Trait	Determining the qualities and attributes of effective leaders should be the primary focus
Behavioural	1940s-1950s	Behavioural	Consider the competencies and behaviors of leaders
Situational	1960s	Contingent and Situational	Attain leaders who modify their approach in consideration of the surrounding context
New leadership	1990s	Transactional	Emphasize the cost-benefit ratio of leadership
	1990s	Transformational	Emphasize an inspirational approach that propels individuals to ever-increasing heights of accomplishment
	2000s	Shared	Consider how followers can guide one another
	2000s	Collaborative	Concentrate on involving followers or a person-focused approach
	2000s	Collective Servant Inclusive Complexity	Concentrate on the entirety of an organization's system

Source: Adapted from Benmira & Agboola (2021) and modified by the researchers.

As for this study, it will focus on both transformational and servant leadership. It is believed that the practice of both transformational and servant leadership by leaders of SMEs is relevant and adaptable to the nature of businesses in Malaysia itself.

Transformational Leadership: Transformational leadership, recognized as a relatively new leadership style, can be traced back to the initial work of Dowton in 1973. Bass (1998) defines transformational leadership as the process of fundamentally changing the thinking and emotional viewpoint of individuals and organizations. This entails broadening one's perspective, gaining a profound understanding, and aligning one's actions with personal views, principles, or values. It also requires effecting lasting, self-sustaining changes that generate momentum. Globally, transformational leadership encompasses individuals with the ability to bring out change, inspire followers with a visionary outlook and facilitate their followers in becoming more creative and innovative (Reza, 2019). According to Robbins & Judge (2017), transformational leaders are characterized as individuals who motivate their followers to transcend their interests and work toward the betterment of the organization. Therefore, those leaders offer direction to their staff to enhance their individual, group, and organizational development and innovation abilities. According to Warrilow (2012) and Bass & Avolio (1993), there were four components, often referred to as the 'Four I's' of transformational leadership which are described below:

a) **Idealised Influence/Charisma**: The leader exhibits endearing behavior and demonstrates strong convictions in the presence of their followers. He/she will act as a role model for the followers.
b) **Inspirational Motivation:** The leader articulates a convincing vision to inspire followers regarding future goals. This motivational behavior fosters a collective sense of team spirit, instilling a general excitement for tackling challenging difficulties within the entire group.
c) **Intellectual Stimulation:** The leader fosters innovation among the followers, prompting them to approach problems from a fresh perspective. Followers are encouraged to inquire, speculate, and frequently reassess fundamental beliefs to determine their accuracy.
d) **Individualized Consideration:** The leader acts as a mentor or coach to each follower to understand their needs and show respect for their contributions to the team. Each follower is regarded as an individual, rather than merely a member of the group.

Servant Leadership: Robert Greenleaf first developed the concept of servant leadership in the early 1970s. He defined servant leadership as the innate desire to serve and prioritize serving others above all else (Northouse, 2018). Similarly, Liden et al. (2008) concluded that servant leaders always prioritize their followers by dedicating themselves to developing them to reach their highest potential. Also, servant leadership can be defined as people-oriented leadership behavior that emphasizes the interests and needs of the followers over the leader's own (Liden et al., 2015). Eva et al. (2019) proposed a revised concept of servant leadership, which involves a leadership style that focuses on the needs and interests of individual followers. This approach also emphasizes shifting one's self-concern towards concern for others within the organization and the broader community. They also added that through servant leadership practice, many benefits can be gained at the corporate, team and individual levels. According to Northouse (2018), leaders in servant leadership are characterized by their focus on being attentive, empathetic and nurturing towards their followers. Furthermore, Coetzer et al. (2017) established four competencies of servant leadership, which encompass a blend of cognitive and technical knowledge, abilities, attitudes, and habits that are utilized to attain a particular standardized result. The competencies are:

a) **Empowerment:** Commitment to developing others to prosper personally, professionally and spiritually, sharing information, encouraging problem-solving independently and building self-confidence.
b) **Stewardship:** The process of assuming responsibility for the interests of a community, an organization and a person; and adopting a mindset of "caretaker" rather than "owner".
c) **Building Relationship:** The leader builds good relationships with individuals, customers, and the community, such as collaboration; communicates effectively with followers; creates an environment of care and support in the organization and understands the needs of others.
d) **Compelling Vision:** The capacity to focus on and formulate a broader vision that is connected to historical occurrences, present patterns, and possible future situations. It will also generate additional value for the community.

Why Transformational and Servant Leadership? SMEs play a crucial role in Malaysia's economy, making substantial contributions to employment, innovation, and general economic expansion (Yusuff et al., 2020; Hirnissa et al., 2018). Meanwhile, leadership itself has been recognized as one of the important elements in

guiding SMEs towards success in the dynamic and competitive business climate (Kocherbaeva et al., 2019). Therefore, transformational and servant leadership, which prioritize employee development, empowerment, and ethical practices, are especially vital for SMEs in Malaysia to ensure continuous growth and greater performance forward (Arshad et al., 2016; Hisham et al., 2020). Firstly, transformational leadership focuses on inspiring and motivating employees to beyond their expectations (Shafi et al., 2020). According to Bourletidis & Triantafyllopoulos (2014), SMEs are able to survive economic crises by developing alternative marketing techniques, implementing inventive tactics, and introducing new concepts, despite the limited resources that they have. Thus, it has highlighted that it is crucial to cultivate a culture of innovation and creativity in SMEs.

Transformational leaders promote a mindset among employees that goes beyond mundane activities, creating a conducive atmosphere for the development of innovative ideas. Adopting this strategy is crucial for SMEs aiming to distinguish themselves in the market and adjust to evolving business environments. In SMEs, where human capital is a valuable asset, investing in employee development is crucial. A study conducted by Onkelinx et al. (2016) provided support for the notion that investing in employee human capital is crucial for enhancing labor productivity and internalization in rapidly expanding SMEs. Transformational leaders prioritize the development of individuals, providing opportunities for skill enhancement and career progression (Dong et al., 2017; Hetland et al., 2018). Also, this approach not only improves the capabilities of the workforce but also enhances employee loyalty and retention, mitigating the challenges of talent turnover that SMEs frequently encounter. As evidence, Tian et al. (2020) in their study regarding employee retention in SMEs, concluded that transformational leadership positively impacts employee retention in SMEs, with organizational behavior and communication as their mediating variables.

Also, servant leadership is another leadership style that can generate various benefits among SMEs as it prioritizes ethical behavior and social responsibility (Sendjaya et al., 2020). For SMEs in Malaysia, maintaining ethical behavior is not just a moral obligation but also a strategic benefit. Servant leaders genuinely prioritize the well-being of their employees and the community, ensuring that the values of the organization are in line with those of society (Dierendonck, 2011). Furthermore, the application of the servant leadership style will create a new, healthy working environment for the employees to engage and develop in a long-term period (Luu, 2019). This commitment to ethical practices enhances the reputation of SMEs, fostering trust among customers and stakeholders. Both transformational and servant leadership styles foster a culture of collaboration and teamwork. In SMEs, where the work environment tends to be close-knit, building strong interpersonal relationships is vital. Transformational leadership has the potential to significantly influence team performance and creativity by improving team communication and fostering trust among teammates (Boies et al., 2015).

Similarly, servant leadership can increase satisfaction and retention through mutual respect, trust and collaboration (Sturm, 2009). These leadership styles promote a sense of unity and a shared vision, facilitating teams to collaborate effectively towards mutual objectives. Thus, effective teamwork is essential for SMEs to address obstacles, take advantage of favorable circumstances, and achieve sustained growth. In conclusion, the implementation of transformational and servant leadership is crucial for the success and sustainability of SMEs in Malaysia. These leadership styles not only bolster employee engagement, innovation and adaptability but also contribute to the ethical underpinning and social responsibility of SMEs. By adopting these leadership concepts, SMEs may establish themselves as dynamic, responsible, and resilient contributors to Malaysia's economic prosperity. In the ever-changing business environment, the role of transformational and servant leadership in SMEs will remain integral for navigating challenges and unlocking new opportunities.

3. Past Research on Leadership and Performance of SMEs in Malaysia

The topic of leadership has been discussed by many researchers more than 100 years before (Kovach, 2018). Nevertheless, the extent of studies on leadership in Malaysia remained somewhat limited in comparison to Western countries. Recently, experts from both local and international backgrounds have made efforts to gain insight into leadership methods in Malaysia (Arham, 2014). Choosing both transformational and servant leadership as the main focus of leadership styles for this study is equivalent to the findings from previous studies. Firstly, many past studies have been conducted relating to transformational leadership and the performance of SMEs in Malaysia. For example, Arham & Sulaiman (2013) conducted a study on leadership and

risk-taking among entrepreneurs in Malaysia. Their findings revealed a predominant use of transformational leadership over transactional leadership among entrepreneurs in Malaysia. Also, the study found that transformational leadership plays a crucial role in influencing the overall safety performance of SMEs in the manufacturing industry in Malaysia (Zulkifly et al., 2023). Meanwhile, in a study by Baharuden et al. (2019), transformational leadership was applied as a moderator variable to examine the factors influencing Big Data and Analytics (BD&A) learning intentions among Malaysian SME executives.

The study's framework demonstrated that transformational leaders indirectly fostered employee creativity and positive organizational changes. Aligned with this perspective, Alnajjar & Hashim (2020) asserted that innovation is crucial to ensure the prosperity of SMEs in Malaysia. Their research emphasized the significance of altruism, indicating that it partially mediated the significant relationship between transformational leadership and innovative work behavior. Despite extensive exploration of leadership in Malaysia by both local and international researchers, there has been a noticeable lack of attention given to the observation and exploration of servant leadership. From a survey conducted in the Scopus database between 2019 to 2023, it was revealed that the keyword of servant leadership between the context of business and management in Malaysia only yielded 9 research as compared to transformational leadership which yielded 40 research, in a similar time duration. Regarded as a prominent leadership theory in contemporary times (Gardner et al., 2020), this leadership style was also being practiced by owners or leaders of SMEs to enhance their business performance.

It was discovered that servant leadership was an important factor to improve the performance of SMEs in Malaysia (Raja Hisham et al., 2020). Indeed, they confirmed that emotional healing, wisdom and organizational stewardship were significantly related to SME performance through path analysis. Supporting this, Poh & Chiew, (2023) discovered a positive relationship between servant leadership and entrepreneurial performance in Malaysian SMEs. Their quantitative research proposed a new research paradigm, incorporating servant leadership, growth, managerial leadership, working capital, instructional leadership and authentic leadership as predictors of entrepreneurial performance. Ng et al. (2016) highlighted the significance of servant leadership among leaders in Malaysian SMEs for cultivating positive relationships with employees. Their research in Johor Bahru yielded results indicating that servant leadership had the ability to decrease the intention of job withdrawal among employees. It demonstrated that adopting servant leadership in SMEs is beneficial for reducing employee turnover. Specifically, the dimensions of servant leadership including listening and ethical behaviour, were found to have a significant mediation effect on turnover intention. Ng (2019) suggested that attending to employees' needs and welfare through servant leadership can be effective in mitigating turnover.

4. Discussion and Contribution of Study

The topic of leadership itself has been discussed by many researchers for more than 100 years (Kovach, 2018). In SMEs, leadership is a complex and crucial factor that greatly impacts the success and sustainability of the organizations. Several common characteristics can be highlighted in discussing SMEs in Malaysia. Firstly, many SMEs in various industries are struggling with the limited resources to support their businesses from time to time (Zhang, 2021). Therefore, a transformational leader, who can provide a good vision and transform employees for the better is needed to achieve their goals in business. Another characteristic of Malaysian SMEs is that most of the companies established in this country are based on the employee-oriented principle (Shaikh et al., 2021). To address this, the concept of servant leadership is suitable to be applied as it emphasizes the need to serve subordinates as the top priority (Mahon, 2020). The outcome of this research is expected to improve the performance of SMEs in Malaysia. By understanding the qualitative perspective of leadership, a better understanding of leadership practices that enhance performance could be developed and presented.

Secondly, this research will discover the practices of both transformational and servant leadership among owners or leaders of SMEs in Malaysia. On top of that, the triangulation data to be analysed based form the focus group discussion with the employees from respective industries would add value to the understanding of transformational and servant leadership among leaders of SMEs in Malaysia. This research anticipates that the owners or leaders of SMEs will display a higher level of transformational and servant leadership in managing their organizations. This is because this research considers that both leadership styles are suited to address the needs of SMEs in this country. Based on previous studies, transformational leadership was proven

to influence the success of owner-managed SMEs in Malaysia (Ng et al., 2016) while servant leadership was able to contribute to the organizational sustainability of Malaysian industry (Batool et al., 2021). In addition, it may construct new guidelines or leadership models on how to manage and maintain the performance of SMEs despite any business challenges that can be used specifically in Malaysia. It is believed that by adapting these leadership styles to the local business environment, SMEs can enhance their performances and contribute positively to Malaysia's dynamic economy.

5. Conclusion

In conclusion, the primary objective of this study is rooted in the recognition that there is a necessity for a more profound comprehension of the leadership styles exhibited by the leaders of Malaysian SMEs. The analysis of effective leadership in SMEs in Malaysia uncovers a complex array of leadership strategies that are essential for organizational success. This study started by first revealing the definition of leadership from different perspectives and variations of leadership theories that existed in this study area. Also, the combination of transformational and servant leadership in the SME landscape is crucial for promoting innovation, employee engagement and overall organizational resilience. With the aim to uncover new findings and have a better understanding of the current situation, it will be conducted by using a qualitative approach to attaining rich information data from the selected respondents of SMEs leaders. Besides, new findings and theories may be developed, inspired by the current needs and wants of SMEs in Malaysia. Thus, this brings a new direction to the researchers' deep interest in this topic in enhancing the leadership literature focusing on the successful leadership styles of SMEs specifically in the local context of this country. Also, given the significant role that SMEs play in the Malaysian economy, it has consequences that go beyond theoretical discussion. It provides practical counsel for SME leaders, policymakers and scholars. Further, the same study is encouraged to be done in other industries and regions of SMEs. It is believed that by improving the leadership styles in an organization, the performance of SMEs can be expanded for the business to grow and flourish.

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Integrating Technology in Government Internal Audit: Catalysts and Challenges

Nur Syafiqah Ahmad Ramli[1] & Nor Aishah Mohd Ali[2*]
[1]Faculty of Accountancy, Universiti Teknologi MARA Shah Alam, Shah Alam, Selangor, Malaysia
[2]Faculty of Accountancy, Universiti Teknologi MARA, Cawangan Melaka, Kampus Alor Gajah, Alor Gajah, Melaka, Malaysia
*aishah72@uitm.edu.my

Abstract: In an era marked by digital transformation, various sectors, including government entities, are reevaluating their operational methodologies. This research delves into the pivotal elements influencing the adoption of Information Technology (IT) within the internal audit departments of governmental agencies. The study is grounded in detailed interviews conducted at three distinct government organizations, revealing the intricate dynamics of incentives, barriers, and the prospective benefits associated with IT integration. Preliminary results suggest that a myriad of factors critically shape the strategy toward IT implementation. These include the anticipated enhancements in audit efficiency and effectiveness due to IT adoption, the level of support from senior management, budgetary constraints, and the lack of specialized IT expertise. The findings offer insightful recommendations for government bodies, aiming to aid them in navigating the complexities of IT integration. This study not only highlights the significant role of supportive leadership and resource allocation in facilitating IT adoption but also underscores the need for skill development in this domain. Ultimately, it serves as a strategic guide for government agencies to optimize their auditing processes through effective IT integration.

Keywords: *Internal audit, Information Technology, user perceptions, Organizational culture, IT infrastructure.*

1. Introduction

Information technology (IT) integration has emerged as a crucial component for organizations looking to increase their operational efficiency, effectiveness, and accountability in the modern era of rapid technological advancements. This trend is prominently observed in government agencies across the globe, including Malaysia. The Internal Audit Department (IAD) within these agencies plays a crucial role in maintaining financial integrity, adhering to compliance, and managing risks (Johari, Hadi, & Rashid, 2018). In response to evolving environmental demands, there's a growing realization among government agencies about the necessity of embedding IT into their auditing (Sarwadhamana & Pharmasetiawan, 2018). This strategic integration enables the IAD to leverage technological tools and data analytics to conduct more thorough and real-time audits, fostering a proactive approach to financial governance and risk mitigation. As government agencies continue to navigate the complexities of the modern landscape, embracing IT in auditing practices becomes instrumental for staying abreast of challenges and ensuring sustained organizational resilience (Johari, Hadi, & Rashid, 2018). Globally, government agencies are navigating the complexities of adapting to a technology-driven era. Malaysia, with its expanding IT sector, is actively engaging in this transition. The integration of IT into government operations, particularly internal audits, is viewed as a strategic move to boost operational efficiency and transparency.

While also facilitating immediate monitoring and reporting (Noor, et al., 2022). Therefore, incorporating IT within the Internal Audit Department is increasingly becoming a crucial step for ensuring effective operation and maintaining high standards of accountability in the digital age. This strategic move aims not only to enhance operational efficiency but also to foster transparency, enabling immediate monitoring and reporting mechanisms. According to (Johari, Hadi, & Rashid, 2018), the integration of IT within the Internal Audit Department is increasingly recognized as a crucial step in ensuring the effective operation of government agencies and upholding high standards of accountability in the digital age. This shift reflects a proactive stance, acknowledging the pivotal role of technology in navigating the complexities of contemporary governance while emphasizing the importance of adaptability and responsiveness to technological advancements. The adoption of information technology (IT) within the Internal Audit Department holds paramount importance in contemporary governance, contributing to enhanced operational efficiency, transparency, and accountability. According to (Mohd Noor & Mansor, 2019) integrating IT into government operations, particularly in internal

audits, is a strategic move. IT adoption facilitates immediate monitoring and reporting, empowering auditors to conduct more thorough and real-time assessments.

This aligns with the evolving landscape of technology-driven governance, where reliance on IT tools allows for proactive risk management and compliance assurance (Ronkko, Paananen, & Vakkuri, 2018). Additionally, the potential for IT adoption within the Internal Audit Department to streamline audit procedures and improve the accuracy of financial evaluations highlights its significance. The integration of IT tools enables auditors to analyze large datasets efficiently, identify irregularities promptly, and ensure compliance with regulatory standards (Johari, Hadi, & Rashid, 2018). This not only accelerates audit cycles but also contributes to the overall effectiveness of the audit function. In framing the context of this research, it's essential to highlight the importance of IT adoption in the Internal Audit Department. First and foremost, IT adoption can significantly improve the efficiency of audit processes by automating routine tasks, thereby freeing auditors to concentrate on more strategic areas such as risk assessment and analysis (Al-Hiyari, 2019). IT can enhance the accuracy and dependability of audit outcomes through sophisticated data analytics, minimizing errors, and improving the quality of audit reports (Jaber & Abu Wadi, 2018). Additionally, incorporating IT into audit practices can lead to increased transparency and accountability (Mohd Noor & Mansor, 2019). It allows for immediate access to data, thus enabling auditors to monitor financial transactions and compliance more effectively.

This aspect is particularly crucial in Malaysian government agencies, where public trust and accountability are of utmost importance. Moreover, IT adoption can assist in conforming to international audit standards and regulatory requirements (Mohamed, Ismail, & Abdullah, 2020). With government agencies often under strict scrutiny and reporting mandates, employing IT tools can facilitate compliance with these standards, making the audit process more streamlined and efficient. Despite the numerous benefits IT adoption brings to the Internal Audit Department, its implementation is fraught with challenges (Jaber & Abu Wadi, 2018). Adopting IT, particularly navigating through a complex array of factors, many of which are deeply ingrained, especially in the user's perceptions (Davis, 1989). This study seeks to illuminate these factors, aiding government agencies in Malaysia and other similar settings in making well-informed decisions regarding IT adoption in their internal audit departments. This study also sets out to investigate the factors influencing IT adoption in the Internal Audit Department of Malaysian government agencies. By thoroughly examining the institutional, organizational, and individual facets, the study aims to provide an in-depth understanding of the complexities involved in IT adoption. As government agencies endeavor to align with the ongoing digital revolution across various sectors, this research offers critical insights to inform strategic decision-making, ultimately leading to enhanced efficiency, transparency, and accountability in the operations of Malaysian government agencies.

2. Review of Literature

Technology Acceptance Model (TAM): The 1989 Davis Technology Acceptance Model (TAM) is a key framework for understanding internal audit department IT adoption. TAM can anticipate and explain technology user behavior, revealing why people choose certain technologies (Zhu & Kraemer, 2005). The TAM framework centers on perceived usefulness and perceived ease of use, which strongly impact technology adoption (Davis, 1989). These criteria reveal internal audit staff incentives and concerns about adopting new IT systems (Radner & Rothschild, 1975). Davis defines perceived usefulness as "the degree to which a person believes that using a particular system would enhance his or her job performance." Internal audit auditors believe that adopting IT tools will increase their professional performance (Johari, Hadi, & Rashid, 2018). Auditors must realize that these technologies can improve productivity, accuracy, and risk assessment (Jaber & Abu Wadi, 2018). This component reinforces the idea that users are more likely to adopt technology if they see it as useful for their work. However, perceived ease of use is pivotal within the TAM framework. It represents the degree to which an individual believes that using a particular system would require minimal effort (Radner & Rothschild, 1975).

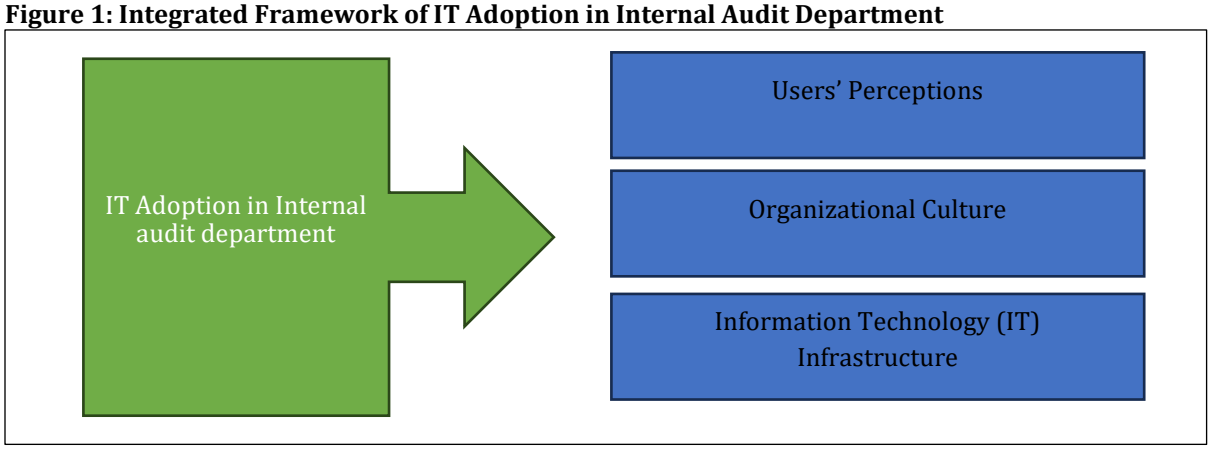
In internal audits, this element measures auditors' technology comfort. It includes IT system usability, interface simplicity, and implementation assistance (Alkebsi & Aziz, 2017). As smooth and hassle-free integration is desirable, auditors are more inclined to embrace technology when they find it easy to use and are encouraged by its implementation (Noor, et al., 2022). Knight & Burns examine users' perceptions of ongoing technology use. They created the OTAM (Ongoing Technology Acceptance Model) to study people's changing technology

attitudes. They found that technology perceptions can change with experience. Long-term satisfaction may depend on system performance (Shih, 2004), ease of use, and perceived usefulness (Davis, 1989). Technology acceptability is dynamic, and user experiences shape perceptions, according to the study. TAM is essential for understanding internal audit IT adoption. Organizations can better understand auditors' technology adoption decisions by assessing the perceived utility and perceived ease of use (Davis, 1989). This understanding is essential for developing strategies to boost IT integration and improve internal audit processes, which will help the company succeed.

Information Technology Adoption in the Internal Audit Department: In recent years, the adoption of information technology (IT) within government agencies, specifically within the Internal Audit Department, has gained increasing significance (Mohd Noor & Mansor, 2019). The integration of IT tools and systems into the traditional practices of auditing has opened new avenues for enhancing the efficiency, effectiveness, and accuracy of audit processes (Jaber & Abu Wadi, 2018). As government agencies increasingly recognize the potential benefits that IT adoption can bring to their internal auditing functions, understanding the factors that influence this adoption has become a crucial area of research and practice (Eulerich, Wagener, & Wood, 2021). According to (Mohd Noor & Mansor, 2019), internal audit departments play a pivotal role in government agencies by ensuring accountability, compliance, and the efficient allocation of resources. Traditionally, audits have been conducted using manual, paper-based methods, which can be time-consuming and resource-intensive (Eulerich, Wagener, & Wood, 2021). However, the advent of IT has offered a transformative opportunity. The incorporation of IT tools can automate routine tasks, facilitate data analysis, improve the identification of risks, and streamline the overall audit process (Al-Hiyari, 2019). As government agencies strive to enhance their audit capabilities and ensure the effectiveness of their internal audit department, understanding the factors that influence IT adoption becomes imperative (Noor, et al., 2022). These factors encompass a wide array of organizational, individual, and contextual elements, and comprehending their interplay is essential for optimizing IT adoption processes (Al-Hiyari, 2019).

Conceptual Framework for Web-Based Sustainability Reporting: This study has established a comprehensive framework for examining the adoption of information technology within an internal audit department, as illustrated in Figure 1. The framework comprises three key elements: (1) Users' perceptions; (2) Organizational culture; and (3) Information technology infrastructure.

Figure 1: Integrated Framework of IT Adoption in Internal Audit Department



Users' Perceptions of Information Technology Adoption: The integration of technology into the internal audit function has witnessed a transformative shift in recent years (Jaber & Abu Wadi, 2018). Understanding users' perceptions of the adoption of technology is a multifaceted topic that encompasses a wide range of factors. Understanding users' perceptions of technology adoption is a multifaceted subject that encompasses various psychological, social, and cultural factors (Davis, 1989). People's beliefs, attitudes, experiences, and the context in which they find themselves all have an impact on the process by which they choose to adopt or reject a particular technology. Studies that have been done have investigated the complex network of factors that shape users' perceptions of technology use. Users' perceptions, including factors like age, gender, and background, significantly influence their perspectives and feelings regarding technology use (Abou-EL-Sood,

Kotb, & Allam, 2015). One of the fundamental factors influencing users' perceptions of technology adoption is its perceived usefulness. Perceived usefulness, as outlined in the Technology Acceptance Model (TAM) by Davis, is a fundamental factor influencing technology adoption. People are more likely to adopt technology if they believe it enhances their efficiency, productivity, or overall well-being. The perceived utility of technology is closely tied to how well it aligns with individual needs and goals (Serag & Daoud, 2021). At its core, perceived usefulness refers to the degree to which an individual believes that a particular technology will enhance their performance or make their tasks easier to accomplish.

When users perceive a technology as useful, it positively impacts their overall attitude toward using it. They develop a favorable attitude because they anticipate that adopting the technology will lead to positive outcomes (Serag & Daoud, 2021). In other words, if users believe that the technology is beneficial and valuable, they are more inclined to accept it and intend to incorporate it into their routines or tasks (Al-Hiyari, 2019). Perceived ease of use is another critical component in understanding users' perceptions of technology adoption (Davis, 1989). It assesses how user-friendly and usable a technology appears to users. It focuses on users' beliefs about the ease and simplicity of interacting with the technology (Serag & Daoud, 2021). The user interface's complexity, the system's usability, the instructions' clarity, and the time and effort needed to become tech-savvy all have an impact on this perception (Jaber & Abu Wadi, 2018). Essentially, perceived ease of use reflects users' expectations of how easily they can integrate the technology into their daily routines (Al-Hiyari, 2019). When users find the technology intuitive and straightforward, with clear menus and easy navigation, they tend to rate it as highly user-friendly (Jaber & Abu Wadi, 2018). The importance of perceived ease of use lies in its role as a determinant of users' attitudes and intentions toward technology adoption (Shihab, Meilatinova, Hidayanto, & Herkules, 2017). When individuals perceive a technology as easy to use, it positively impacts their overall attitude towards adopting and using it. This positive attitude, in turn, influences their intention to use the technology.

Information Technology (IT) Infrastructure: Information technology (IT) infrastructure serves as the backbone of an organization's technological ecosystem, and its role in influencing IT adoption cannot be overstated. IT infrastructure encompasses a complex web of hardware, software, data centers, networks, and support systems that collectively enable the functioning of an organization's IT environment (Abou-EL-Sood, Kotb, & Allam, 2015). This infrastructure is not merely a passive entity but a dynamic force that exerts profound effects on an organization's ability to adopt and integrate new technologies (Betti & Sarens, 2021). Performance and reliability are equally critical factors (Serag & Daoud, 2021). High-performance infrastructure ensures that new technologies can operate efficiently, meeting user expectations and avoiding bottlenecks that could hinder adoption. Reliability, on the other hand, guarantees uninterrupted service, which is essential for critical applications. According to (Marei, Emer, & Mohd Iskandar, 2019), an organization with a robust IT infrastructure that consistently delivers high performance and reliability is more likely to embrace innovative technologies, knowing that they can be effectively integrated into existing systems without causing disruptions.

Moreover, when adopting new technology, individuals often express significant concerns about security and compliance issues (Al Hadwer, Tavana, Gillis, & Rezania, 2021). IT infrastructure must provide robust security measures to protect sensitive data and systems from a wide array of threats, including cyberattacks and data breaches (Betti & Sarens, 2021). Additionally, it must offer compliance capabilities to ensure adherence to legal and industry-specific regulations, which is particularly relevant in highly regulated sectors (Johari, Hadi, & Rashid, 2018). Organizations must be confident that their IT infrastructure can safeguard their digital assets before they can fully embrace new technologies (Al-Hiyari, 2019). Cost considerations are another critical aspect of adopting IT in (Al Hadwer, Tavana, Gillis, & Rezania, 2021). The affordability of IT infrastructure can significantly influence IT adoption decisions. Organizations must weigh the capital and operational expenses associated with infrastructure upgrades against the potential benefits of adopting new technologies (Tronto & Killingsworth, 2021). An overly expensive infrastructure can deter technology adoption, especially for smaller organizations with limited budgets. Therefore, cost-effectiveness is a key determinant of an organization's willingness to invest in the IT infrastructure required to support innovative technologies.

Organizational Culture: The adoption of technology in the field of internal audit is not just about acquiring and implementing new software or tools; it is also closely connected to the organization's culture and its readiness for change (Johari, Hadi, & Rashid, 2018). Research indicates that organizations with a culture that

values innovation and embraces change are more likely to adopt new technologies successfully. Additionally, the organization's readiness for technology adoption, including its infrastructure, resource allocation, and leadership support, plays a significant role in determining the pace and success of technology implementation (Soomro, Hizam-Hanafiah, Abdullah, Ali, & Jusoh, 2021). Internal audit departments operate within the broader context of their organizations, and the success of technology adoption is pivotal in determining how well these departments can overcome cultural barriers and cultivate a culture of technological innovation (Eulerich, Wagener, & Wood, 2021). This study explores the significant role that an organization's culture and readiness for change play in influencing the adoption of technology within internal audit functions.

Organizational culture encompasses shared values, beliefs, and norms that shape behavior and decision-making within an organization (Betti & Sarens, 2021). A culture that values innovation, embraces change, and encourages experimentation is more likely to facilitate technology adoption in the internal audit function. Conversely, a conservative or risk-averse culture can act as a significant impediment (Abou-EL-Sood, Kotb, & Allam, 2015). Internal auditors often work in organizations with well-established cultures and long-standing practices. They may encounter resistance to change from colleagues who are comfortable with traditional audit methods (Zainol, Ariffin, & Rozali, 2018). Leadership support, resource allocation, and the organization's capacity for adaptation are a few factors that have an impact on this culture (Al Hadwer, Tavana, Gillis, & Rezania, 2021). Leadership plays a pivotal role in driving technology adoption (Sarwadhamana & Pharmasetiawan, 2018). If senior management is committed to the integration of technology, it sends a strong signal to the rest of the organization. Therefore, fostering a culture that emphasizes the benefits of technology adoption and encourages auditors to explore and embrace new tools is paramount (Mohd Noor & Mansor, 2019). By doing so, they can harness the full potential of technology and enhance the efficiency and effectiveness of their audit functions. In the context of technology implementation in organizations, the effective allocation of resources is crucial for achieving success.

The authors highlighted the necessity of allocating sufficient funds for technology adoption (Zhu & Kraemer, 2005). This allocation acts as a concrete indication of an organization's dedication to adopting new technologies as a part of its growth and change strategies. On the other hand, underscores the significance of investing in training and development programs, as they equip employees with the essential skills and knowledge required to harness new technologies effectively (Al-Hiyari, 2019). Additionally, the authors highlight that organizations possessing agile and adaptable structures are better positioned to seamlessly integrate technology into their internal audit processes (Abou-EL-Sood, Kotb, & Allam, 2015). These flexible structures empower organizations to respond promptly and efficiently to evolving technological landscapes, ensuring that technology adoption aligns harmoniously with the organization's overarching objectives and bolsters its innovation capabilities, as emphasized by (Marei, Emer, & Mohd Iskandar, 2019). This literature review succinctly encapsulates the key elements influencing technology adoption in internal audit functions. It emphasizes the importance of user perceptions, IT infrastructure, and organizational culture. In summary, these factors collectively form a comprehensive framework that guides organizations in effectively implementing and integrating new technologies in their internal audit processes.

3. Methodology

This study employs a qualitative research design to investigate the factors influencing the adoption of information technology (IT) within the Internal Audit Department (IAD) of Malaysian government agencies. The case study approach is well-suited to this research, as it allows for an in-depth exploration of a complex phenomenon within its real-life context (Yin R. , 2018). In this case, the focus is on understanding the intricate dynamics that shape the adoption of IT in internal auditing, considering the contextual factors unique to Malaysian government agencies. The study primarily focuses on internal auditors within Malaysian government agencies as the key study participants possess unique insights into the operational and functional aspects of the Internal Audit Department, including its use of IT tools and technologies. The selection of participants is based on criteria related to years of experience, ensuring that participants have a significant background in internal auditing, improving the depth and quality of the data gathered. In cases where identifying participants may be challenging, a snowball sampling approach is utilized. Snowball sampling, while not a random sampling technique, is particularly suitable when dealing with a hard-to-reach or small population (Berg, 2009).

This approach facilitates access to individuals with relevant experience and expertise in the field. The three participants selected are internal auditors from various Malaysian government agencies, each representing different industries and sectors. To ensure the collection of rich and insightful qualitative data, semi-structured interviews were employed as the primary data collection method (Baskarada, 2014). The choice of interviews is rooted in the notion that internal auditors, as experienced professionals within their field, can provide valuable insights and narratives regarding the adoption of IT tools and technologies. The semi-structured nature of the interviews enables flexibility in probing deeper into participants' experiences, perceptions, and viewpoints while also ensuring that key research questions are addressed. The interviews delve into participants' job details, responsibilities, and accomplishments, with a specific focus on their experiences and perceptions related to the adoption of IT in internal auditing. To maintain consistency and minimize potential biases in the interview process.

Clear instructions and guidelines are provided to participants, ensuring a standardized approach across all interviews. Audio recordings were used during the interviews to accurately capture participants' responses. These recordings serve as a valuable resource for later data analysis. Interviews which typically lasted between 30 to 90 minutes, were conducted in person, audio-recorded with consent, and transcribed verbatim for analysis. This transcription process further enhances data accuracy and facilitates efficient data management. In the subsequent stages of data analysis, a comprehensive approach is adopted. Qualitative data analysis is primarily conducted with the assistance of Computer-Assisted Qualitative Data Analysis Software (CAQDAS), specifically Atlas.ti. The software aids in managing and organizing the vast amount of qualitative data collected from interviews. The qualitative data from interviews, document reviews, and observations are analyzed using thematic analysis, a widely recognized qualitative data analysis method (Braun & Clarke, 2006). This method involves identifying patterns, themes, and categories within the data to develop a comprehensive understanding of the factors influencing IT adoption. Throughout the research process, ethical considerations meticulously addressed by guidance obtained from the relevant ethical review board, such as informed consent being secured from all participants, confidentiality, and participant anonymity, will be meticulously addressed to ensure the highest ethical standards are upheld. Participants were assured of their right to withdraw from the study at any point without any repercussions.

4. Results and Discussion

Demographic and Profile of Respondents: Table 1 overleaf provides the outcomes of a study that involved conducting face-to-face interviews with three respondents situated in the Klang Valley. All three participants held positions as assistant internal auditors within the government sector, representing different industries. These interviews provided valuable insights into the field of internal auditing within this specific geographical context. The participants, designated as R1, R2, and R3, contributed diverse backgrounds and areas of expertise to the research, thereby enriching the study with a comprehensive perspective on their respective roles and responsibilities. Two participants, R1 and R3, have expertise in performance audits, which encompass thorough evaluations of organizational effectiveness, efficiency, and adherence to legal obligations. This process involves assessing different internal processes, systems, and procedures to verify they are in line with set standards and regulations. On the other hand, R2 principally emphasizes financial audits, which involve thorough examinations of financial statements, documents, data, and accounting entries to guarantee precision, openness, and adherence to accounting rules. R1, who has accumulated more than 6 years of experience, and R2, with over 8 years of experience, contribute significant practical expertise and insights to their respective positions. Due to their extensive experience in the sector, they can efficiently handle difficult auditing challenges. In contrast, R3, boasting an excellent 14-year tenure, stands out as an experienced authority in the field of performance audits. Due to their vast expertise, they offer a distinct viewpoint on the historical development of internal auditing processes in the government sector.

Table 1: Demographic and Profile of Respondents

Respondents	Position	Specialization	Job Scope	Years of Experience
R1	Assistant Internal auditor	Performance Audit	Assessment of effectiveness, efficiency, and compliance with legal requirements.	More than 6 years
R2	Assistant Internal auditor	Finance Audit	Reviews a company's financial statements, documents, data, and accounting entries.	More than 8 years
R3	Assistant Internal auditor	Performance Audit	Assessment of effectiveness, efficiency, and compliance with legal requirements.	More than 14 years

Interacting with these experienced experts provides an opportunity to delve into the subtle complexities of government sector internal auditing in Malaysia as this study aims to clarify the difficulties, identify optimal methods, and comprehend the changing dynamics in this crucial field.

Analysis of Factors Influencing its Adoption in Internal Audit Department: Table 2 provides a detailed analysis of factors influencing IT adoption in internal audit departments, based on the perspectives of three key respondents (R1, R2, and R3). It categorizes these factors into three themes: *users' perceptions, organizational culture*, and *IT infrastructure*. The table uses checkmarks to indicate each respondent's agreement and application of these factors. This overview highlights the complexity of IT integration in auditing, emphasizing the importance of aligning *user perceptions, organizational culture*, and *IT infrastructure* for effective technology utilization in audits.

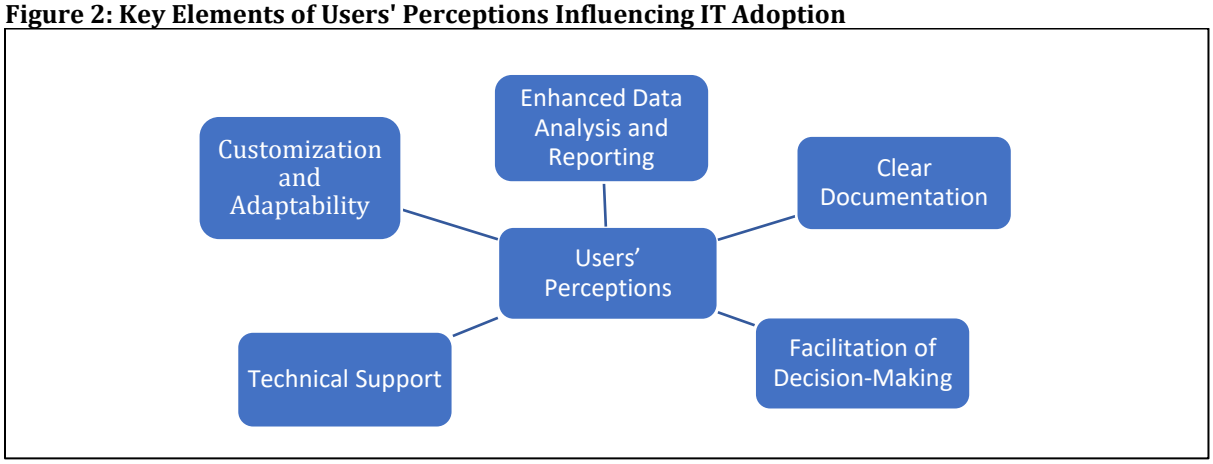
Users' Perceptions: Influencing IT adoption within the internal audit function, one crucial element is users' perceptions. It involves how individuals within the organization perceive the utility and benefits of IT tools in their audit processes. Under the aspect of users' perceptions, several key factors, as shown in Figure 2, are identified. Firstly, enhanced data analysis and reporting signify the recognition that users perceive the value of IT adoption in improving the analysis and reporting of audit data. Secondly, clear documentation highlights the importance of having well-documented processes and procedures, which contribute to smoother IT adoption. Thirdly, facilitation of decision-making indicates that users view it as a tool that aids in making informed decisions. Fourthly, technical support underscores the significance of having reliable assistance and troubleshooting mechanisms. Finally, customization and adaptability reflect the understanding that users appreciate IT systems that can be tailored to meet their specific needs and are adaptable to changing circumstances.

One crucial aspect of adopting IT in the organization is facilitating decision-making. In contemporary auditing, the utilization of IT tools for advanced data analytics, visualization, and reporting is indispensable. These tools facilitate real-time processing and analysis of data, enabling auditors to promptly address emerging issues and risks. This agility enhances the perceived value of IT in internal auditing, as auditors can effectively mitigate risks, streamline processes, and contribute to organizational objectives. Auditors encounter the challenge of sifting through extensive datasets to identify anomalies, trends, and patterns. IT tools equipped with data analytics capabilities assist auditors in efficiently handling this task. *"We have excellent technical support, so we don't feel burdened by the use of IT tools because, typically, we will get help right away if there are any problems." (R2)*

Table 2: Analysis of Factors Influencing Adoption Themes by the Respondents

Factors Influencing the IT adoption		Respondents			Audit IT tools
		R1	R2	R3	
Users' Perceptions	Enhanced Data Analysis and Reporting		√	√	Google tools
	Clear Documentation	√	√	√	
	Facilitation of Decision-Making	√	√	√	
	Technical Support		√		
	Customization and Adaptability		√	√	
Organizational Culture	Innovation Mindset	√	√		Audit Command Language
	Leadership Support	√	√	√	
	Training and Development		√	√	
	Change Orientation		√		
IT Infrastructure	Cost Consideration	√	√	√	Audit Dashboard System
	User Interface Design		√	√	
	Performance and Reliability	√			
	Data Management and Storage		√		
	Security and Compliance Framework		√		

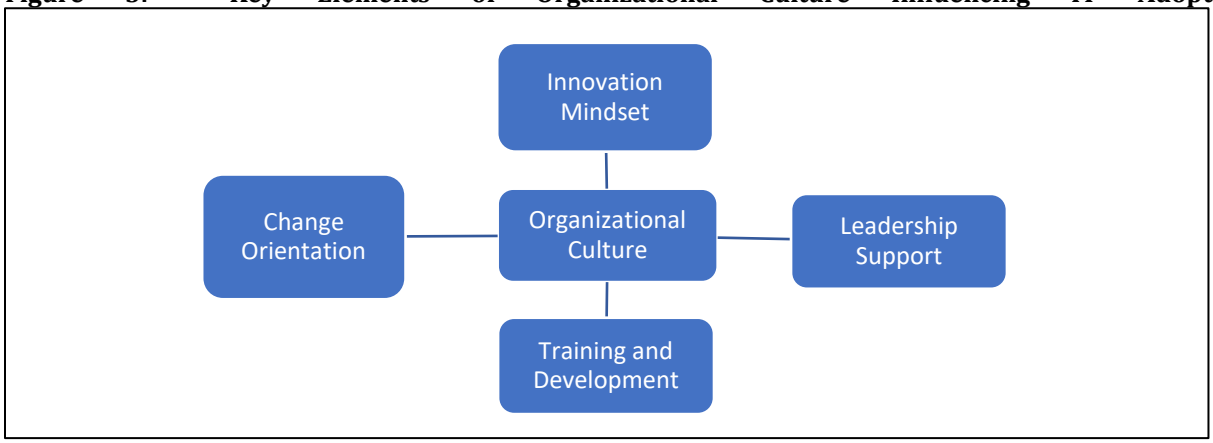
Figure 2: Key Elements of Users' Perceptions Influencing IT Adoption



Respondent R2 emphasized the importance of a reliable support system for swiftly resolving technical issues, ensuring uninterrupted work for auditors. This reduces frustration and enhances overall satisfaction with IT solutions. Proactive technical support can also drive ongoing improvements in IT tools by incorporating feedback and insights from auditors, leading to enhanced user-friendliness over time. Auditors' unique requirements and preferences, stemming from the nature of their audits and the industries served, underscore the need for customizable IT systems. Like R3, tools tailored for performance audit work are crucial for R2's specific tasks and functions. Customizable IT tools aligning with audit methodologies, risk assessments, and reporting standards foster a sense of ownership and agency. This customization boosts efficiency and seamless integration with existing audit processes.

Organizational Culture: Organizational culture plays a crucial role in the successful adoption of IT in internal audit functions, as outlined in Figure 3. This culture encompasses an innovation mindset, leadership support, investment in employee training and development, and a willingness to embrace change. These elements collectively foster an environment conducive to IT integration.

Figure 3: Key Elements of Organizational Culture Influencing IT Adoption



An innovation mindset is essential, as it encourages auditors to explore and embrace new technologies (Betti & Sarens, 2021). The importance of an innovation mindset lies in its ability to break down traditional barriers and facilitate the integration of IT into internal audit practices. As highlighted by R2 during the interview, auditors often prefer manual auditing methods over using IT tools due to resistance to change in mindset. This sentiment was echoed by interviewee R1, who commented: *"When it comes to discussing IT within the internal audit department, for now, we are still conducting internal audits manually. Perhaps promoting the use of IT in our work should not be limited to internal auditors alone but should encompass the entire organization. If only internal auditors use IT while other departments remain manual, it won't be very effective." (R1)* Indeed, empowered auditors who feel encouraged to embrace new technologies tend to discover innovative methods for enhancing audit efficiency and effectiveness. They are less constrained by rigid procedures and more inclined to utilize IT tools that streamline their tasks.

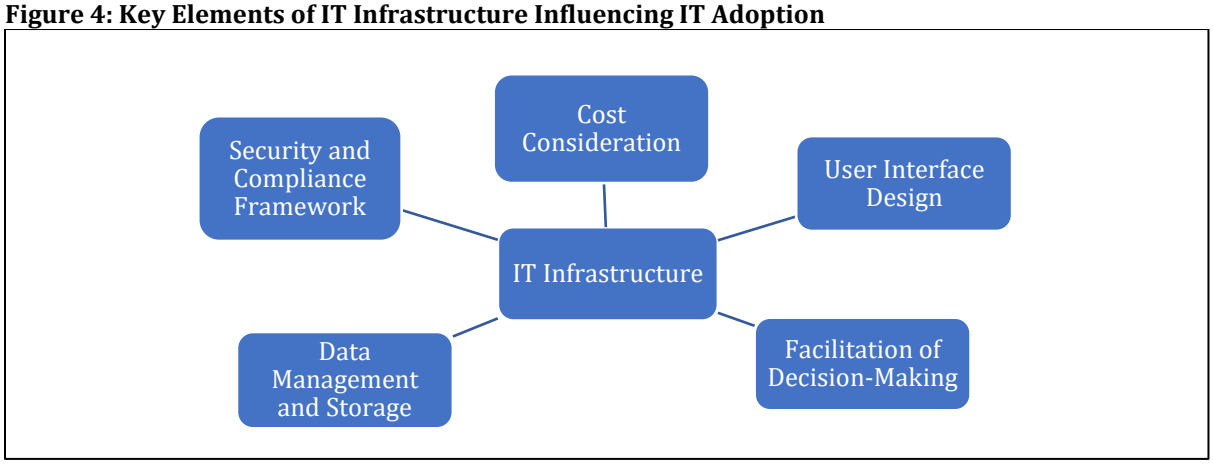
Organizational leadership, on the other hand, was found to significantly influence IT adoption in internal audits. Active support and promotion of IT usage by top management signal to the entire organization that technology adoption is a priority. This support fosters a culture conducive to IT integration. Leadership backing is evident through financial investments in IT infrastructure, vocal endorsement of IT initiatives, and resource allocation for IT-related training and development. When leaders advocate for IT adoption, internal auditors perceive technology as essential to their roles. While all respondents agree on the importance of top management, R1 and R3 received comparatively less encouragement and support. Moreover, Leadership support is also critical. It influences the organization's culture toward IT integration. All respondents agreed on the importance of management's role, but R1 and R3 noted less encouragement from top management.

In contrast, R2 shared a positive experience: *"We have an excellent leader. We are highly encouraged by our top management, which makes us more inclined to use IT tools in internal audits. Each of us receives regular training, so we have adequate knowledge in using our IT tools for auditing." (R2)* This support includes financial investment, endorsement of IT initiatives, and resources for training. Training and development are vital for equipping auditors with the necessary skills to use IT tools effectively (Johari, Hadi, & Rashid, 2018). A culture that values continuous learning ensures auditors are prepared to harness its potential. Lastly, a change-oriented culture is key. It helps auditors view change positively, making them more adaptable to new IT tools and methodologies. R2's experience reflects this, where a receptive attitude towards change facilitated the transition from manual to automated audit processes. In summary, the interplay of these cultural elements shapes the successful adoption of IT in internal audits, as evidenced by the experiences of R1, R2, and R3.

IT Infrastructure: The successful adoption of IT within organizations is influenced by a myriad of factors, each of which plays a pivotal role in shaping the decision-making process. One of the crucial factors is IT Infrastructure. Figure 4 illustrates five key elements that exert significant influence on IT adoption: User Interface Design, Performance and Reliability, Cost Considerations, Data Management and Storage, and Security and Compliance Framework. Understanding the interplay and importance of these factors is essential

for organizations seeking to effectively harness the potential of IT infrastructure, ensuring alignment with their operational needs and strategic goals.

Figure 4: Key Elements of IT Infrastructure Influencing IT Adoption



In the realm of IT infrastructure, Figure 4 highlights five key factors integral to IT adoption. User interface design is crucial, emphasizing user-friendly and intuitive interfaces for higher adoption rates. Performance and reliability are equally important, stressing consistent and dependable IT systems to support organizational processes. Cost consideration underscores the need for evaluating the financial aspects of IT adoption to align with strategic objectives. Data management and storage are essential, emphasizing secure data handling to maintain integrity and accessibility. Lastly, the security and compliance framework recognizes robust security measures and regulatory adherence to safeguard IT adoption initiatives. A critical aspect of this adoption process is cost consideration. As one respondent, R1, pointed out: *"Previously, we did utilize IT tools to aid in our internal audit work. However, the cost of these IT tools was quite high. However, we only used them for a few years because the interface and system design were not user-friendly. So, we reverted to conducting our audit work manually." (R1)*

R1 has highlighted several important considerations in the context of technology adoption in internal audits. Firstly, it emphasizes cost-effectiveness, necessitating thorough cost-benefit analyses due to high IT tool costs. Secondly, it stresses the importance of user-friendly interfaces for auditors' effective utilization of technology. User-friendly interfaces are crucial, with organizations urged to consider alternatives if tools fall short. Intuitive designs enhance interactions, reducing learning curves and fostering efficiency. R1 emphasizes the necessity of user-friendly interfaces to facilitate effective IT tool usage. Performance and reliability in IT infrastructure are vital, directly impacting system speed, efficiency, and consistency. Optimized infrastructure ensures swift data access and processing, enhancing productivity. Reliable uptime and rapid response times streamline audit workflows, enabling focus on core tasks. In the realm of internal audit, performance and reliability are crucial due to the need for timely data access and efficient analysis. A well-optimized infrastructure reduces audit cycle times and enhances productivity, enabling auditors to focus on core tasks. *"With the advent of audit technology tools in recent years, it has aided me in acquiring data, especially since the data I require comes from staff across various departments. Typically, without IT tools, I would have to wait patiently for individual responses, which can be quite time-consuming. However, with the current IT tools, I can easily access the data I've received through our system." (R3)*

In the contemporary audit landscape, copious amounts of data necessitate robust IT infrastructure for effective data management. Such infrastructure enables seamless organization, retrieval, and archival of audit data, enhancing audit process efficiency. Access to historical data provides invaluable context for auditors when assessing organizational progress over time. Furthermore, swift data retrieval facilitates trend identification and anomaly detection, enhancing auditors' capacity to pinpoint potential areas of concern. For instance, R2 highlights how rapid data analysis enhances auditors' ability to identify trends and anomalies. Lastly, the Security and Compliance Framework is highlighted as a key factor. R2 emphasized the importance of robust security measures like encryption, which protect sensitive audit data and ensure compliance with regulatory

standards. In the study conducted by Betti & Sarens, (2021), in the digital age of data breaches and cyber threats, IT infrastructure security and access controls are crucial. This aspect of IT infrastructure provides auditors with the confidence to leverage digital tools, knowing that the integrity and confidentiality of sensitive information are maintained. The successful adoption of IT in internal audit functions hinges on a harmonious interplay of these factors. Organizations must ensure that their IT infrastructure aligns with operational needs and strategic goals, considering the insights and experiences of their internal auditors, as exemplified by R1 and R2. These results may enhance our overall comprehension of internal auditing in the government sector, providing advantages for both scholars and professionals in the industry.

5. Conclusion and Recommendations

This study has comprehensively explored the complex landscape surrounding technology adoption in internal audit functions. The application of the Technology Acceptance Model (TAM) has offered a robust framework for comprehending users' perceptions and decision-making regarding technology integration. The research has highlighted the dynamic nature of technology acceptance, emphasizing the influence of ongoing user experiences and system performance. Additionally, the study has emphasized the pivotal importance of organizational culture, where innovation, change orientation, and leadership support are key drivers of successful technology adoption. In the context of IT infrastructure, security, performance, reliability, user-friendly design, and cost considerations have emerged as vital factors that facilitate the adoption process. Clear documentation and robust technical support have also been recognized as crucial elements for a smooth transition to technology-driven internal auditing practices. As we reflect on these findings, it becomes evident that successful technology adoption in internal audit departments requires a comprehensive approach. Organizations should not only focus on the technical aspects of IT implementation but also on cultivating a supportive organizational culture and providing the necessary resources and training for their internal auditors.

This study serves as a valuable resource for internal audit professionals, organizational leaders, and IT professionals, offering insights into the factors that can drive successful technology adoption and enhance the efficiency and effectiveness of internal audit processes. Looking forward, future research in this domain should focus on several avenues. Firstly, the study can be extended to examine the impact of IT adoption on the overall effectiveness and efficiency of the internal audit process, considering quantitative measures and performance indicators. Secondly, investigating the role of training and development programs in enhancing auditors' IT skills and their subsequent impact on technology adoption would provide valuable insights. Additionally, exploring the challenges and barriers faced by organizations in the adoption of IT tools and strategies to overcome them would contribute to a comprehensive understanding of the adoption process. Lastly, a comparative analysis of IT adoption practices across different sectors and industries within Malaysia could reveal sector-specific trends and best practices. These avenues of research can further enrich our understanding of technology adoption in the context of internal auditing and contribute to more effective implementation strategies.

Recommendations

To effectively integrate IT into internal audit functions, organizations should focus on user-friendly IT products with comprehensive documentation and strong technical support. This approach reduces the learning curve for auditors and minimizes disruptions, allowing smoother technology integration. Developing an innovative mindset within the organizational culture is vital, encouraging auditors to embrace new technical solutions and think creatively about audit processes. Senior executive support is also critical for successful IT integration. Leadership should allocate resources, openly support IT initiatives, and invest in training programs targeting IT skills. This ensures auditors have the necessary knowledge and abilities to leverage IT tools effectively. Conducting a thorough cost-benefit analysis is essential for informed decision-making regarding IT implementation, ensuring financial viability aligns with the anticipated benefits. Improving IT infrastructure in security, performance, reliability, data management, and user interface design is crucial. A robust security and compliance framework protects audit data and builds auditor trust, while an optimized infrastructure boosts efficiency and productivity. Organizations need to establish quantitative metrics and performance indicators to measure the tangible impacts of IT adoption. Addressing challenges and obstacles during IT implementation

and devising solutions to overcome these issues is essential. Industry-specific analyses help organizations customize their IT strategies, enhancing the efficiency and effectiveness of internal audit procedures. This approach not only improves audit processes but also fosters a culture of innovation and technological advancement.

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The Impact of Social Trust, Social Network and Financial Innovation on the Financial Well-Being of Micro-Entrepreneurs in Malaysia: A Pilot Study

Putri Aliah Mohd Hidzir[1*], Shafinar Ismail[1], Sharifah Heryati Syed Nor[2] & Aqilah Nadiah Md Sahiq[1]
[1]Faculty of Business and Management, Universiti Teknologi MARA Cawangan Melaka, Off Jalan Hang Tuah, Melaka, Malaysia
[2]Faculty of Business and Management, Universiti Teknologi MARA Cawangan Selangor, Selangor Darul Ehsan, Malaysia
aliahidzir@gmail.com*, shafinar@uitm.edu.my, heryati879@uitm.edu.my, aqilahnadiah@uitm.edu.my

Abstract: This study aims to assess the reliability and validity of a questionnaire designed to measure the impact of social trust, social networks, and financial innovation on the financial well-being of micro-entrepreneurs in Malaysia. Employing a descriptive research design and a cross-sectional approach, data were collected from 140 micro-entrepreneurs, with the questionnaire serving as the primary research instrument. The findings reveal strong internal consistency within the factors under investigation, underscoring the robustness of the questionnaire. Additionally, insights into the demographic profile of micro-entrepreneurs offer a valuable understanding of their characteristics and operational dynamics. The implications of this study extend to policymakers, industry stakeholders, and researchers, providing actionable insights to support the sustainability and resilience of micro-entrepreneurs. Overall, this research contributes to advancing knowledge in the areas of social trust, social networks, and financial innovation concerning the financial well-being of micro-enterprises. It holds significant implications for fostering economic growth, reducing inequalities, and promoting inclusive development in Malaysia.

Keywords: *Financial well-being, micro-entrepreneurs, pilot study, questionnaire, Malaysia*

1. Introduction

The study of financial well-being transcends a mere examination of income and wealth, delving into various facets of an individual's financial life. This critical research domain seeks to provide a comprehensive understanding of consumers' economic health and stability, encompassing money management, spending habits, savings practices, and investment behavior. It offers a holistic perspective on financial well-being (Mohamed, Jaffar, & Faizal, 2023). Achieving financial well-being implies not only the ability to navigate unforeseen financial challenges but also the freedom to make intentional decisions about resource allocation to enhance the quality of life (Nguyen, 2022).

The definition of micro-enterprises varies globally, and understanding these definitions is essential for the context of this research. In Malaysia, micro-enterprises are defined by specific criteria that determine their size and scope of operations. For instance, the Small and Medium Enterprises Corporation Malaysia (SME Corp. Malaysia) defines micro-enterprises as businesses with sales turnover not exceeding RM300,000 or with full-time employees not exceeding five workers (SME Corp, 2021). In contrast, the World Bank's SME Department provides a broader definition, categorizing micro-enterprises as businesses with up to 10 employees, total assets of up to $10,000, and total annual sales of up to $100,000 (Ayyagari, Beck, & Demirgüç-Kunt, 2007).

Micro-enterprises play a crucial role in sustainable growth and the realization of the Sustainable Development Goals (SDGs) (Muñoz-Pascual, Curado, & Galende, 2019; Korneeva, Skornichenko, & Oruch, 2021; Kusuma, Pradhanawati, Ngatno, & Dewi, 2022). Achieving SDG Goal 1 (no poverty), Goal 8 (decent work and economic development), and Goal 10 (reduced inequalities) is closely tied to the development of small businesses. Research highlights the role of Micro, Small, and Medium Enterprises (MSMEs) in poverty alleviation, economic growth, and income distribution, aligning with the SDGs (Santoso, 2020; Ana T. Ejarque1, 2020; Pompeia, 2021). Social enterprises have been recognized for their potential to achieve all SDGs by 2030, emphasizing their contribution to sustainable development (Fauziah & Kassim, 2022). Supporting small businesses is not only an economic imperative but also a strategic pathway toward building a more sustainable and inclusive global community.

In the Malaysian economic landscape, micro-enterprises form a significant segment within the broader category of MSMEs, playing a pivotal role in driving the country's economic engine. According to SME Corp. data from 2021, MSMEs collectively contributed 40% to Malaysia's Gross Domestic Product (GDP) and played a vital role in employment, accounting for 65% of the nation's total employment (SME Corp., 2021). However, recent pandemic crises have disproportionately impacted MSMEs, especially in service sectors. This sector encompasses various subsectors, including wholesale and retail trade, food and beverages, and accommodation (Kamaruddin & Shamsudin, 2021), all of which have been adversely affected by the recent global crisis. During the period from January to September 2023, the services sector emerged as the dominant force in attracting investments, as evidenced by its substantial share of approved investments amounting to RM117 billion, which accounted for 52% of the total inflow. This strong investment inflow underscores the sector's pivotal role in driving economic growth and development. Moreover, the services sector's prominence is further highlighted by its projected contribution to job creation, with an anticipated 40,607 new jobs expected to be generated (Birruntha, 2023). Such figures not only reflect the sector's attractiveness for investments but also its capacity to provide employment opportunities, thereby contributing significantly to overall economic prosperity.

However, the closure of non-essential businesses during the pandemic has dealt a severe blow to micro-businesses, resulting in a sharp decline in sales and profits, disrupted supply chains, diminished consumer activity, and increased the vulnerability of micro-enterprises to external shocks (SME Corp., 2021). These challenges present the critical need to examine the financial well-being of micro-entrepreneurs and develop targeted strategies to enhance their adaptive capabilities during crises.
The objective of this study is to assess the reliability and validity of a questionnaire designed to measure the impact of social trust, social networks, and financial innovation on the financial well-being of micro-entrepreneurs in Malaysia.

The paper is organized into five sections, with the introduction providing an overview. The second section presents the literature review and theoretical model. The third section details the research method, covering questionnaire design and validation. The fourth section presents the findings of the pilot study. The concluding section offers a comprehensive analysis and discusses the study's contributions before presenting the conclusions. This structured approach ensures a thorough exploration of the research objectives, methods, and outcomes, contributing valuable insights to the understanding of the financial well-being of micro-entrepreneurs in the Malaysian context.

2. Literature Review

Social Capital Theory: Social capital theory posits that social relationships constitute valuable resources with economic benefits (Joanis, Burnley, & Mohundro, 2020). Rooted in the concept of social capital, which accumulates through social networks and trust, fostering norms of collective reciprocity (Singh P. R., 2022), this theory comprises four key components: networks, resources, norms, and trust, continuing to influence the work of others (Alfred, 2009). Moreover, social capital theory addresses the importance of social exchange, social contacts, and social support (Nakhaie, Smylie, & Arnold, 2007). Overall, it is a fundamental concept underpinning social trust and social networks, contributing significantly to financial well-being.

Furthermore, the implications of social capital theory extend across various domains, such as knowledge sharing in information systems development projects (Lee, Park, & Lee, 2015) and understanding financial socialization's impact on the financial well-being of young employees (Joanis et al., 2020). Additionally, it has been associated with the financial well-being of entrepreneurs, retirees, and sportswomen, highlighting its relevance in diverse financial contexts (Adler & Kwon, 2002; Alfred, 2009; Kistyanto, 2021).

Financial Well-being: Financial well-being has garnered recent interest, focusing on various factors influencing individuals' financial well-being. It encompasses the ability to meet current financial needs, maintain desired living standards, and plan for future financial goals. Financial well-being involves both subjective perceptions and objective measures of financial security and stability (Brüggen, Hogreve, Holmlund, Kabadayi, & Löfgren, 2017).

Several studies contribute to understanding financial well-being. For instance, research by Zhao and Zhang (2020) and Sabri et al. (2021) explored the value of family financial socialization and the influence of financial knowledge, behavior, and strain on young adults' financial well-being. These studies provided insights into the direct effects of financial socialization on financial behavior and well-being, along with determinants of young adults' financial well-being.

Social Trust: Trust is a crucial concept in establishing social relationships and organizational cooperation, serving as a key form of social capital (Jiang & Liu, 2023). Studies by Raffar (2022) and Wang et al. (2023) explored the relationship between social trust and well-being, particularly in the context of societal well-being and the well-being of first-generation college students. These studies highlighted the significance of social trust and its multiple mediation effects on subjective well-being.

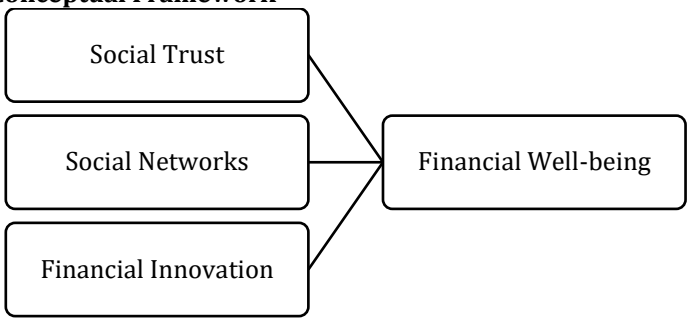
Additionally, social trust's influence on financialization indicates its significant role in the degree of financial development (Yin, Kirkulak-Uludag, & Matthews, 2020). Furthermore, high social trust has been emphasized for predicting well-being, alleviating negative psychological effects of adversity and leading to higher perceived availability of protective resources (Jovanović, Sarracino, & Lazić, 2021). High trust towards strangers, known as social or generalized trust, correlates with economic performance, low corruption, effective government, social integration, and subjective well-being (Svendsen & Svendsen, 2016).

Social Network: Social networks play a significant role in influencing both well-being and financial well-being. Research indicates that social capital, measured by family, neighborhood, religious, and community ties' strength, is strongly linked to subjective well-being through various independent channels and in different forms (Helliwell & Putnam, 2005). The size and composition of social networks influence subjective well-being, with larger and more diverse networks associated with higher well-being levels (Wang X. , 2014).
Moreover, the relationship between social network characteristics and subjective well-being varies across age groups, necessitating age-specific considerations in understanding the impact of social networks on well-being (Shankar & Steptoe, 2015; Zheng & Chen, 2020). The influence of social networks on financial well-being extends across various demographic and socioeconomic factors, emphasizing the complex interplay between social networks and financial well-being (Bongomin, Munene, Ntayi, & Malinga, 2018).

Financial Innovation: Financial innovation significantly impacts financial well-being through various channels. It plays a crucial role in influencing the demand for money by reducing agency costs, facilitating risk-sharing, and enhancing the quality and variety of banking services, ultimately contributing to financial well-being (Jonah, Egbe, & Richard, 2021). The evolution of financial products and services, such as mobile money, has the potential to significantly influence consumption levels and their variance (Jack & Suri, 2014), ultimately contributing to financial well-being. Elements of financial innovation, such as technological advancements and available financial solutions, have the potential to influence an individual's financial well-being (Ponchio, Cordeiro, & Gonçalves, 2019). Additionally, financial innovation has been associated with the resilience and collaborative innovative leadership of firms, contributing to their ability to generate new ideas and add value to their operations (Brown & Kasztelnik, 2020). Financial innovation has also been positively linked to economic growth through gross capital formation, indicating its potential to enhance overall financial well-being (Bernier & Plouffe, 2019).

Conceptual Framework:
The current study proposes a conceptual framework based on a literature review and the theory of social capital. In the context of this study, the researchers suggest that social trust, social networks, and financial innovation significantly influence the financial well-being of micro-entrepreneurs.

Figure 6: Proposed Conceptual Framework



The current research follows a descriptive research design, which involves systematically collecting, analyzing, preparing, and presenting data within a conceptual framework. In this case, a cross-sectional research design was chosen to examine the factors that impact the financial well-being of micro-entrepreneurs.

3. Methodology

The objective of this study is to evaluate the reliability and validity of a questionnaire designed to measure the influence of social trust, social networks, and financial innovation on the financial well-being of micro-entrepreneurs in Malaysia. The study employs a descriptive research design, systematically collecting, analyzing, preparing, and presenting data within a conceptual framework. A cross-sectional research design has been chosen to explore the factors impacting the financial well-being of micro-entrepreneurs. The survey questionnaire serves as the primary instrument, and a sample of 140 micro-entrepreneurs from various regions across Malaysia participated in a pilot test before the final analyses.

Questionnaire Design

Table 1 below summarizes the questionnaire items used in the study and their respective sources. The surveys employed were adapted from past literature, utilizing a 5-point Likert Scale (ranging from "*strongly disagree*" to "*strongly agree*"), consistent with the scale in preceding studies.

Table 8: Questionnaire Items and Sources

Variables	Number of Items	Sources
Social Trust	5	Chow & Chan (2008)
Social Networks	5	Yamagishi & Yamagishi (1994)
Financial Innovation	14	Njogu (2014)
Financial Well-being	5	Nițoi, Clichici, Zeldea, Pochea, & Ciocîrlan (2022)

Before distributing the questionnaires, a thorough validation process involving two key steps was undertaken to ensure the items were acceptable and easily understood by respondents. Initially, the questionnaires were submitted to an academic translator due to their derivation from English articles. Employing the back-to-back translation method, the items were meticulously translated to ensure vocabulary equivalence, following the procedure outlined by Bougie and Sekaran (2020). Subsequently, the questionnaires underwent scrutiny by two academic experts affiliated with Universiti Teknologi MARA (UiTM) for content and language validation. An industrial expert from SME Corp. Malaysia, representing the regulatory authority for micro-enterprises, participated in the evaluation process. Prior to distribution, the researcher incorporated refinements based on the invaluable insights and critiques offered by these experts. This rigorous validation process ensures that the questionnaires used in the study are suitable and accurately capture the intended information from the participants.

4. Results and Discussion

This study aims to assess the reliability and validity of a questionnaire designed to gauge the impact of social trust, social networks, and financial innovation on the financial well-being of micro-entrepreneurs in Malaysia. According to Saunders, Lewis, and Thornhill (2009), researchers should include at least ten samples in pilot

testing, while larger-scale research typically involves between one hundred and two hundred samples. Therefore, the survey was administered to micro-enterprises throughout Malaysia, resulting in the distribution of 140 questionnaires, all of which were returned. Table 2 provides insights into the characteristics of the study sample. Additionally, Table 3 depicts a comprehensive breakdown of the exploratory factors analysis associated with all questionnaire items.

Table 9: Demographic profile of respondents

Descriptions	Categories	Frequency (N=140)	Percentage (%)
Employment	Entrepreneurs	140	100
Age	Below 18 years old	2	1.4
	18-24 years old	38	27.1
	25-34 years old	52	37.1
	35-44 years old	25	17.9
	45-54 years old	15	10.7
	55-60 years old	7	5
	61 years old and above	1	0.7
Gender	Male	39	27.9
	Female	101	72.1
Number of workers	1-2	79	56.4
	3-4	46	32.9
	More than 4 workers	15	10.7
Sales Turnover	Below RM300,000 per year	112	80
	Above RM300,000 per year	28	20
Duration of working/ operation year	Less than a year	13	9.3
	1-5 years	51	36.4
	6-10 years	27	19.3
	11-15 years	13	9.3
	16-20 years	12	8.6
	More than 20 years	24	17.1
Sector	Wholesale and retail trade	70	50
	Food and beverages	37	26.4
	Accommodation	2	1.4
	Information and communication	2	1.4
	Transportation and storage	2	1.4
	Health	5	3.6
	Education and art	7	5
	Entertainment and recreation	1	0.7
	Professional	1	0.7
	Others	13	9.3
Location	Northern region	15	10.7
	East coast region	39	27.9
	Central Region	28	20
	Southern region	28	20
	East Malaysia	30	21.4
Business account	Yes	70	50
	No	70	50
Have you received any assistance?	Yes	65	46.4

	No	73	53.6
Financial Assistance	Government	25	17.9
	State Agencies	3	2.1
	Zakat Institutions	4	2.9
	Financial Institutions	6	4.3
	Family	29	20.7
	Not Applicable	73	52.1

The dataset findings, as shown in Table 2, provide valuable insights into the demographic and operational characteristics of micro-entrepreneurs in Malaysia. First and foremost, the study exclusively focuses on individuals actively engaged in entrepreneurial activities, with all respondents identifying themselves as entrepreneurs. A noteworthy aspect of the demographic profile is the diverse age distribution observed among micro-entrepreneurs. The age distribution demonstrates diversity, with the majority falling within the 18-34 age bracket. Notably, individuals aged 25-34 represent the largest subgroup, comprising 37.1% of the sample. Gender representation within the micro-entrepreneurial community is another significant aspect illuminated by the data. Female entrepreneurs constitute a significant majority, accounting for 72.1% of the sample, while male entrepreneurs make up the remaining 27.9%. This gender distribution highlights the active participation and significant contribution of women to the entrepreneurial landscape in Malaysia.

Operational characteristics such as workforce size and sales turnover further enrich our understanding of micro-enterprises in Malaysia. They are used as the criteria to validate respondents as micro-entrepreneurs, based on the definition set by SME Corp. Malaysia. Most micro-enterprises operate with a small workforce, with 56.4% employing 1-2 workers, followed by 32.9% employing 3-4 workers, while sales turnover varies widely among respondents. Most micro-enterprises report annual turnovers below RM 300,000, with 80% falling into this category.

The geographic dispersion of micro-enterprises across various regions of Malaysia, with the East Coast region having the highest concentration (27.9%), highlights the widespread nature of entrepreneurial activities. The sectoral distribution highlights the diversity of economic activities undertaken by micro-entrepreneurs, with wholesale and retail trade emerging as dominant sectors representing 50% of the sample. Half of the surveyed micro-entrepreneurs maintain business accounts, while the remaining half do not. Additionally, the finding that about half of the respondents reported receiving financial assistance, primarily from the government (17.9%) and family sources (20.7%), highlights the importance of external support mechanisms in facilitating the growth and sustainability of micro-entrepreneurs.

Overall, these findings provide a comprehensive understanding of the demographic composition, operational characteristics, and support mechanisms prevalent among micro-entrepreneurs in Malaysia. Such insights are instrumental in informing policies and initiatives aimed at fostering an enabling environment for entrepreneurship and economic growth in the country.

Table 10: Results of Exploratory Factor Analysis

Factors	Cronbach's Alpha	Number of Items
Social Trust	0.784	5
Social Networks	0.865	5
Financial Innovation	0.911	14
Financial Well-being	0.912	5
KMO measure of sampling adequacy	0.854	
Bartlett's test of sphericity	2926.008*	
*Significant at 0.000		

Figure 7: Scree plot of all items

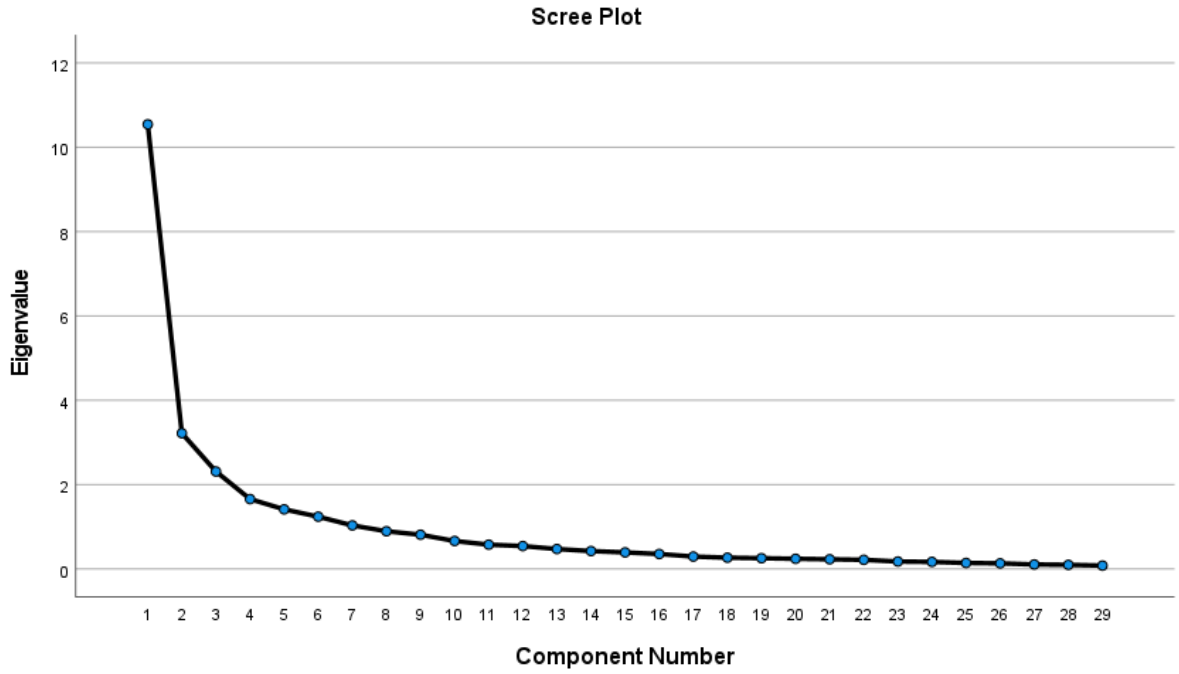


Table 3 presents the outcomes of an Exploratory Factor Analysis (EFA) conducted on the questionnaire items pertaining to four distinct factors: Social Trust, Social Network, Financial Innovation, and Financial Well-being. The analysis reveals strong internal consistency within each factor, as indicated by the high values of Cronbach's Alpha ranging from 0.784 to 0.912. These values suggest that the items within each factor are closely related and effectively measure the underlying constructs. Additionally, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, with a value of 0.854, confirms the suitability of the sample for factor analysis. Moreover, Bartlett's test of sphericity yields a significant result ($p < 0.000$), indicating that the variables are sufficiently correlated to justify conducting the factor analysis. Consequently, the outcomes present the robustness of the questionnaire in capturing the intended dimensions of social trust, social network, financial innovation, and financial well-being, thus enhancing its validity and reliability for the study's purposes.

5. Conclusion and Implications

The pilot study conducted as part of this research plays a pivotal role in ensuring the validity and reliability of the questionnaire used to measure the influence of social trust, social networks, and financial innovation on the financial well-being of micro-entrepreneurs in Malaysia. By administering the questionnaire to a smaller sample size before the full-scale implementation, researchers identified and addressed potential issues or ambiguities in the survey instrument, thereby enhancing its effectiveness in capturing the intended data. Through careful examination and feedback from academic and industry experts, researchers refined the wording, structure, and formatting of the questionnaire to ensure clarity and comprehensibility for the target audience. Furthermore, the pilot study serves as a valuable tool for establishing the credibility and trustworthiness of the research findings. By demonstrating a systematic and rigorous approach to questionnaire development and validation, researchers can enhance the confidence of stakeholders, including policymakers, SME agencies, and peer researchers, in the reliability and validity of the study outcomes.

The findings of this study carry significant implications for policymakers, industry stakeholders, and researchers alike. Firstly, they highlight the critical role of micro-entrepreneurs in driving economic growth and employment generation in Malaysia, necessitating targeted policy interventions to support their sustainability and resilience, particularly in the face of external shocks such as recent pandemic crises. Policymakers can leverage these insights to design tailored support programs and initiatives aimed at

addressing the specific needs and challenges faced by micro-enterprises, including access to finance, capacity-building, and market linkages. Moreover, the findings highlight the importance of fostering an enabling ecosystem for entrepreneurship, characterized by supportive regulatory frameworks, networking opportunities, and access to finance. Industry stakeholders, including financial institutions and SME agencies, can leverage these insights to design customized products and services tailored to the unique needs of micro-entrepreneurs, thereby facilitating their growth and expansion.

From a research perspective, the robustness of the questionnaire items, as evidenced by the outcomes of the Exploratory Factor Analysis, highlights their validity and reliability for measuring the constructs of social trust, social network, and financial innovation, towards financial well-being among micro-entrepreneurs. Researchers can build upon these findings to further explore the intricate relationships between these factors and their impact on the financial well-being of micro-entrepreneurs, thereby contributing to the body of knowledge in this field.

Overall, this study contributes to advancing knowledge in the field of micro-enterprise development and holds implications for fostering economic growth, reducing inequalities, and promoting inclusive development in Malaysia. The pilot study conducted in this research is instrumental in ensuring the validity, reliability, and credibility of the questionnaire used to measure the financial well-being of micro-entrepreneurs in Malaysia. By addressing potential issues and challenges proactively, researchers can enhance the quality and rigor of the study outcomes, thereby maximizing its impact and relevance for stakeholders across various sectors.

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The Relationship Between Digital Technology and Business Innovation Model Among Asnafpreneurs in Malaysia

Norazman bin Harun, Surya binti Ahmad Royali*, Masliana binti Tamrin, Ismadi bin Md Badarudin, Ilya Yasnorizar binti Ilyas, Nor Halawah Binti Ahmad, Muslihah Mohd Munahar
Universiti Teknologi MARA, Cawangan Melaka Kampus Alor Gajah, Malaysia
*surya107@uitm.edu.my

Abstract: Businesses must continually adapt and innovate to stay competitive and maintain high market shares. This includes not only incorporating the latest technology but also creating innovations that aim to increase profitability and sustainability. However, this approach also involves significant risks, as changing the business model to incorporate technological and sustainable elements can be challenging. Digital technology has forced entrepreneurs to reconsider their business models, leading to a need for research on entrepreneurial intention and business models in this area. Thus, this paper seeks to identify the relationship between digital technology and the business innovation model among asnafpreneurs in Malaysia. The study will use a quantitative approach, with a structured survey conducted using Google Forms to gather data. The researcher will use purposive and judgmental sampling, based on recommendations from zakat officers, to select a sample of 299 respondents. Descriptive analysis will be used to examine the existing elements of digital technology, while correlation analysis will be used to examine the relationship between the dependent variable (business innovation model) and the independent variables (digital technology). The study's objective is to analyze the relationship between the business innovation model with digital technology and to propose the elements of digital technology in business innovation to asnafpreneur.

Keywords: *Digital technology, Digitalization, Business Model, Business Innovation Model, Asnaf, Entrepreneur, Asnafpreneur*

1. Introduction

The relationship between digital technology and business innovation models is intricate and multifaceted, and digital innovation, which encompasses the development of market offerings, business processes, or models using digital technology, significantly influences business innovation. (Khin & Ho, 2019). The impact of digitalization on business model innovation (BMI) is complex, and leveraging technological possibilities presents significant strategic obstacles (Rachinger, Rauter, Müller, Vorraber, & Schirgi, 2019). Furthermore, digital innovations and business models are closely related, as digital technologies enable ongoing enhancements to stay relevant in the market and offer lasting value to customers (Parida, Sjödin, & Reim, 2019). Additionally, the advent of digital advancements introduces novel components to corporations, encompassing merchandise, amenities, frameworks, and business schemes, capitalizing on the inherent advantages of digital technology. The correlation between the business innovation model and digital technologies in established small and medium-sized enterprises (SMEs) has been examined, underscoring the necessity for an investigative inquiry into this correlation (Sabatini et al., 2022). The strategic harmonization of digital technology with business augments entrepreneurs' capacity to adapt to market unpredictability and is pivotal in attaining innovative performance (Li et al., 2023).

In today's world, digitalization is crucial for entrepreneurs to adapt to new norms and stay competitive. By embracing digital transactions and innovative technologies, entrepreneurs can transform their conventional business models into more profitable ones that are better suited to meet current market demands (Tasnim et al., 2023). Utilizing technology and digital media for marketing and business can increase access and revenue while reducing costs efficiently (Tasnim et al., 2023). Digitalization also serves various functions, such as information dissemination, promotion, and payment, making it an essential aspect of entrepreneurship activities (Tasnim et al., 2023). Social media platforms like Facebook, Instagram, TikTok, and YouTube provide entrepreneurs with opportunities to improve their businesses, while digital sales platforms like Shopee and Lazada are gaining popularity among customers. Moreover, online delivery companies like Foodpanda, Lalamove, and Grabfood are playing a significant role in the digitalization process (Tasnim et al., 2023). It has been proven that using digital gadgets can increase sales results for small and medium industry (SME) sector

in rural areas by up to 30 percent per year when they participate in the Rural Entrepreneur Digitization Program or Program Pendigitalan Usahawan Desa (PPUD) (Tasnim et al., 2023).

Zakat is an important topic due to its significant role in addressing various issues, particularly those faced by micro-entrepreneurs who are classified as asnafentrepreneurs (Bahri, Aslam, Hj Hasan, & Wibowo, 2019). These entrepreneurs need assistance to overcome their challenging circumstances and potentially become zakat contributors in the business world (Bahri, Bin Muhammad, & Mohammad Aslam, 2021). They are considered asnaf who receive financial support from zakat organizations, and they fall into the category of mustahiq under the classification of impoverished and indigent individuals (Bahri et al., 2021). They are characterized by households with low incomes and engage in diverse trade products and services (Nasir & Talib, 2018). Zalikha (2016) highlighted that the distribution of productive zakat is permissible to enhance the economic well-being of the mustahiq. Previous studies emphasized that asnaf entrepreneurs can fulfill both material and spiritual needs through the process of economic transformation (Rosalina & Bahri, 2022).

As a result, the Asnaf Entrepreneurs program aims to provide basic needs and enable worship of Allah SWT and the program's goal is to meet the material and spiritual needs of the mustahiq (Rosalina & Bahri, 2022). In the present era, Entrepreneurial Asnaf has emerged as a global subject of discourse to foster the progress of the Asnaf community in their pursuit of entrepreneurial endeavors. The underlying principle behind the development of a hybrid model, which combines elements of halal business innovation and technology, is the provision of added value to business enterprises (Munahar, bin Md Badarudin, bin Harun, & ..., 2022). Diverging from conventional acts of charity, zakat encompasses eight distinct categories of asnaf, each of which is explicitly delineated by Allah s.w.t in the Holy Quran, specifically in Surah At-Taubah, verse 60, as aforementioned (Munahar et al., 2022). The focus of this study centers on the needy and impoverished individuals who participate in entrepreneurial activities by using digital technology for their livelihood, referred to as asnaf entrepreneurs or asnafpreneurs.

The confluence of digital technology and entrepreneurship presents a multitude of obstacles and prospects. Digital entrepreneurship involves the merging of conventional entrepreneurial endeavors with cutting-edge technology to establish and manage a digital enterprise (Zainol, Mohd Esa, Muhamad, & Mohamad, 2022). The influence of digitalization on technology entrepreneurship has revolutionized manufacturing processes, resource acquisition, and other entrepreneurship-related operations (Jiao, Wang, & Shi, 2022). Additionally, digitalization offers businesses the chance to enter new markets, broaden their customer base, and engage in inventive activities, including the creation of digital products, services, and business models (Veretennikova & Kozinskaya, 2021). Unlike traditional companies, digital entrepreneurship employs technological advancements as a fundamental aspect of product development and value creation (Fauzi, Harits, Danial & Komariah, 2020).

Upon entering the realm of digitalization, the outdated business model loses its relevance if implemented without any enhancements. In accordance with the advancement of technology, the business model must embrace novel approaches and consistently enhance the caliber of the business. The quandary lies in determining the appropriate methods and procedures to accompany the innovative business model during the era of technological inception. The comprehension of the role that digital technologies play in entrepreneurship, as well as the involvement of users and agents in digital entrepreneurship, remains constrained (Shen, Zhang, & Liu, 2022). This limited comprehension may give rise to a misinterpretation of the concept of digital entrepreneurship, potentially resulting in a narrow distinction between traditional and digital entrepreneurship solely based on the extent of utilization of modern technologies in entrepreneurial endeavors (Krivokuća, Ćoćkalo, & Bakator, 2021).

In Malaysia, the distribution of opportunities by the government to foster a stable economy for Asnaf is a notable endeavor (Munahar et al., 2022). This is particularly done through the provision of allocated funds for entrepreneurial activities or the expansion of existing businesses. These funds encompass various aspects such as capital, working capital, equipment and machinery, as well as skill development courses and training (Munahar et al., 2022). However, the efficacy of this initiative and the caliber of its outcomes remain subjects of scrutiny (Tuan Mahmood, Mohd Din, Al Mamun, & Ibrahim, n.d.). While there exist instances of successful asnafs who have transformed into accomplished entrepreneurs with the assistance of financial support from

zakat organizations, evidence suggests that a considerable number of asnafs, despite receiving initial company financing, struggle to sustain their businesses and rely on monthly zakat assistance for survival (Abdul, Jamaliah, Sharifah, Syed, & Hasan Bahrom, 2012). The central issue at hand pertains to the potential for Asnaf entrepreneurs to achieve success in their business ventures.

It is important to note that these entrepreneurs often belong to the economically disadvantaged group and require financial support to operate their micro and small businesses. Consequently, these entrepreneurs are unable to meet the minimum requirements (kifayah limit) for zakat contributions and are not in a position to contribute to zakat institutions. Asnaf entrepreneurs are relatively new to the business world and may not have the necessary experience or resources to succeed. Thus, it is worth investigating whether asnaf entrepreneurs employ business innovation models that genuinely enhance their enterprises or if they merely serve as rudimentary frameworks for business establishment (Munahar et al., 2022). The study will concentrate on asnaf who operate a business in Malaysia known as asnafpreneur. The study region covers Malaysia, encompassing Peninsula Malaysia, Johor, Kedah, Kelantan, Melaka, Negeri Sembilan, Pahang, Perak, Perlis, Pulau Pinang, Selangor, Terengganu, and Wilayah Persekutuan, which includes West Malaysia, Sabah, Sarawak. Researchers will examine how state Islamic Religious Councils (SIRCs) support Asnaf entrepreneurs and how zakat centers support their businesses. This survey included 14 zakat centers.

2. Literature Review

Asnafpreneur: Previous research defines Asnaf as the groups of people who are permitted to receive Zakat (Syamsul Bahri, Ali, & Mizan Mohammad Aslam, 2023). In accordance with the Qur'an in at-Taubah verse 60, there are eight specific categories of Asnaf, namely: alfuqara (the needy), al-masakin (the poor), al-amylin (the employer of Zakat), almu'allafah qulubuhum (converts who are sought by their hearts), ar-riqab (slaves), algharimin (people who owe), sabilillah (people who engage in jihad in the way of Allah), and the one who travels. The study identifies two categories of assistance provided to Asnaf are identified: consumptive and productive (Syamsul Bahri et al., 2023). Taking into consideration the different categories of Asnaf, the Zakat institution has developed the Asnaf Entrepreneurial Programme (AEP) as an effective means to improve the social and economic well-being of these categories (Din, Ismail, & Rosli, 2019). Asnafpreneur was a term for asnaf and entrepreneur. Asnaf is a low-income citizen group classified as B40 in Malaysia (Tasnim et al., 2023).

According to the research conducted by Zuriyati Yaakub and Nurul Ilyana Muhd Adnan in 2018, it was asserted that asnaf entrepreneurs can be identified as individuals who are engaged in the process of establishing a business. Among the asnaf groupings, asnafpreneurs constantly hope to use entrepreneurial platforms to go from unproductive to productive asnaf. (Azhar Meerangani et al., 2022). These individuals possess the necessary abilities to fulfill their obligations and responsibilities, and they are motivated to engage in trade activities due to the support and guidance provided by zakat institutions in Malaysia (Yaakub & Muhd Adnan, 2018). The target beneficiaries of this support are primarily the destitute, the impoverished, as well as those who have recently embraced Islam and are facing financial hardship (Yaakub & Muhd Adnan, 2018). Additionally, this group will receive the support and direction they need to launch their own business. It is now time for these asnafpreneurs to enter the digital business sector to maximize their potential and secure the long-term viability of their company. (Tasnim et al., 2023).

Digital Technology: Digital start-ups that have driven significant waves of innovation over the past few decades, such as Airbnb, Amazon, Google, and Facebook, are frequently featured in media narratives (Sahut, Iandoli, & Teulon, 2021). These start-ups have been supported by emerging technologies like the Internet of Things, big data, and robotics and the rapid development has altered the competitive landscape and compelled traditional businesses to reconsider their strategies, models, and processes (Bharadwaj, El Sawy, Pavlou, & Venkatraman, 2013). Digital technologies have enabled the creation of new businesses and start-ups that integrate technology into their business models and operations (Elia, Margherita, & Passiante, 2020). Previous studies identified these technologies act as enablers of entrepreneurial activity and can take various forms, such as digital products or services, digital platforms, digital tools or infrastructure, digital or Internet-enabled service innovations (Elia et al., 2020)

The pervasive influence of digital transformation has extended to virtually all industries and types of companies, leaving only the most traditional businesses untouched. Furthermore, the growth of open innovation and digital communities has streamlined essential entrepreneurial activities (Elia et al., 2020) Although digitalization impacts all aspects of society, it primarily influences the transformation of entrepreneurial and business models across various industries (Satalkina & Steiner, 2020). This is due to changing societal needs (arising from new demands or industry pressure) that dictate adaptations in the value creation process, communication, and cooperation patterns, ultimately fostering innovative changes in business models (Satalkina & Steiner, 2020). Besides, the development of open innovation and participation are associated with the development of digital communities able to streamline crucial entrepreneurial activities. Digital technologies play a crucial role in empowering goods and services, as well as stimulating creativity to develop innovative solutions. (Elia et al., 2020).

The impact of information technology and digital technologies on business innovation and entrepreneurship is multifaceted, serving as a facilitator, mediator, or outcome of entrepreneurial operations, or the overall business model (Steininger, 2019). The concept of digital entrepreneurship was introduced to describe the creation of new ventures and the transformation of existing businesses through the development of new digital technologies or the adoption of novel usage patterns (Elia et al., 2020). It is also known as cyber-entrepreneurship, which refers to the use of Internet and technology platforms to manage and execute business operations with customers, intermediaries, or partners, and sell digital products or services across electronic networks (Elia et al., 2020). Digital entrepreneurship is a critical pillar of digital economic development and underscores the importance of pursuing opportunities based on digital media and technologies through a pivotal business model framework that leverages three key components such as marketing, transaction, and back-office (Elia et al., 2020; Shen et al., 2022). Adopting a knowledge-based perspective, it facilitates the exchange, transfer, and acquisition of knowledge while initiating new ways of doing business and also refers to how startups leverage digital technologies and human agents to accomplish the overall entrepreneurial process (Elia et al., 2020; Geissinger et al., 2019; Le Dinh et al., 2018).

Business Innovation Model: In the current business environment, various factors such as globalization, technological advancements, the emergence of the Internet, and progress in information technology have a significant impact on businesses (Turulja & Bajgoric, 2019). As a result, companies are constantly compelled to adapt and modify their business practices (Turulja & Bajgoric, 2019). This need arises from the recognition that organizational success in the modern era depends on effectively developing, capturing, and delivering value to end-users (Smajlović, Umihanić, & Turulja, 2019). Therefore, the concept of the business model becomes a crucial element in the pursuit of such achievements (Osterwalder, 2004; Smajlović et al., 2019). Earlier research defined of the business model as a "method of conducting business" and claims that the business model elucidates the company's operational framework and fundamentally offers insights into value generation (Smajlović et al., 2019). In the course of this, the potential for value creation arises from the configuration of interactions between companies and external stakeholders (Amit & Zott, 2001; Smajlović et al., 2019). The innovation of the business model involves the introduction of a completely new business rationale or, at the very least, an improvement of the existing business rationale, leading to value creation for the company (Markides, 2006; Casadesus-Masanell & Zhu, 2013; Smajlović et al., 2019).

In the dynamic and evolving business environment, the innovation of business models is widely recognized as a critical source of competitive advantage (Markides, 2006; Amit & Zott, 2001; Casadesus-Masanell & Zhu, 2013; Smajlović et al., 2019). It is considered one of the primary factors that determine the success of modern companies The primary focus of business model innovation is on discovering new ways to generate revenue and define value propositions for various stakeholders, including partners, suppliers, and customers (Smajlović et al., 2019). Several research studies have reported a positive impact of business model innovation on a company's performance (Smajlović et al., 2019). They argue that business model innovation can enhance corporate venture performance, contend that such innovations can help companies build a competitive advantage by creating a new business model that generates value for customers (Futterer, Schmidt, & Heidenreich, 2018). These authors further conclude that continuous innovation of products, services, and business models is necessary for a company's survival and growth, ultimately leading to increased value creation (Smajlović et al., 2019). Previous research also found that companies that enhance their business

model innovation can achieve optimal benefits, including cost reductions and strategic flexibility (Smajlović et al., 2019).

The hypothesis testing is based on the statements stated below:
H_0: There is no relationship between Digitalization Technology and the Present Business Innovation Model.
H_1: There is a relationship between Digitalization Technology and the Present Business Innovation Model.

In the diagram we can see the relationship as:

Figure 1: The Relationship between Digitalization Technology and Business Innovation Model among Asnafpreneurs in Malaysia



3. Research Methodology

This paper employed a quantitative approach wherein the researcher conducted a structured survey with the asnafpreneur using a Google Form questionnaire, which was then distributed among the asnafpreneur community until the research-based recommendations by selected officers were fulfilled. The focus of this study is on the asnafpreneur population in Malaysia. The researcher will utilize purposive sampling and judgmental sampling based on recommendations from zakat officers. Purposive sampling allows the researcher to select specific cases that illustrate relevant features or processes of interest. However, this sampling method requires careful consideration of the parameters of the population under study and the selection of sample cases accordingly. Additionally, purposive sampling helps identify common behavioral patterns across units of analysis that face diverse resource conditions and constraints, thereby facilitating theoretical extraction to a greater extent than with a more homogeneous sample. A total of 299 respondents were received from 420 respondents recommended by state zakat officer using Google Form questionnaire, which falls within the recommended sample size range of 30 to 500 respondents according to (Uma Sekaran, 2013). Descriptive analysis will involve the use of measures such as mean, mode, median, range, and percentage, as deemed appropriate. These findings will be presented in a suitable format, such as a table, graph, or chart. Correlation analysis will be conducted to examine the relationship between the dependent variable (business innovation model) and the independent variables (digital technology). This analysis is crucial for addressing the research objectives of the study.

4. Finding

Summary of Business Innovation Model: There are 7 elements in the respondent's opinion on the Business Innovation Model analyzed (Table 1). The respondents stated Strongly Agree against all those elements 1:I feel that internal nature plays an important role for the asnafpreneur to succeed (63.9%), 2:I feel that external nature plays an important role for the asnafpreneur to succeed (56.9%), 3:I feel that the Halal factor is necessary for the success of the asnafpreneur business (68.6%), 4: I am of the opinion that doing a shariah-compliant thing will make the asnafpreneur business a success (78.3%), 5: I feel that digitalization is necessary for the advancement of asnafpreneurs (59.5%), 6:I feel that technology is the catalyst for asnafpreneur progress (54.2%) and 7: I feel that the zakat center is the main source of asnafpreneur success (51.85).The 299 respondents put a 59.2% average for the Business Innovation Model.

Table 1: Asnafpreneur Opinion about Business Innovation Model

Business Innovation Model Among Asnafprenuer	Strongly Disagree (%)	Disagree (%)	Moderate (%)	Agree (%)	Strongly Agree (%)
I feel that internal nature plays an important role for the asnafpreneur to succeed	0.7	1.0	1.0	33.4	**63.9**

I feel that external nature plays an important role for the asnafpreneur to succeed	1.0	1.7	3.7	36.8	**56.9**
I feel that the Halal factor is necessary for the success of the asnafpreneur business	0.7	0.7	2.0	28.1	**68.6**
I am of the opinion that doing a Shariah-compliant thing will make the asnafpreneur business a success	0.3	0.0	1.3	20.1	**78.3**
I feel that digitalization is necessary for the advancement of asnafpreneurs	0.3	1.0	2.3	36.8	**59.5**
I feel that technology is the catalyst for asnafpreneur progress	0.3	0.3	4.7	40.5	**54.2**
I feel that the Zakat Centre is the main source of asnafpreneur success	1.7	3.3	9.7	33.4	**51.8**
The mean average of 299 respondents	**0.3**	**0.3**	**1.0**	**39.1**	**59.2**

Summary of Digitalization Technology: Table 2 displays the platform in opposition to the 12 components of Digitalization Technology implemented by the participant in the research area. Overall, the mean participant's equalization resided at the level of agreement (74.9%). In more specific terms, there exist 7 components at the level of strong agreement, 4 components at the level of agreement, and there is 1 component at the level of strong disagreement. These circumstances transpire due to their negative nature in comparison to the remaining 13 elemental affirmations.

Table 2: Asnafprenuer's Opinion about Digitalization Technology

Digitalization Technology Among Asnafprenuer	Strongly Disagree (%)	Disagree (%)	Moderate (%)	Agree (%)	Strongly Agree (%)
I learned that the passage of time impacted my business	0.7	1.0	5.0	39.8	**53.5**
I feel I don't need to change anything to keep trading in this digital age	**31.1**	22.1	27.4	11.7	7.7
I need to take to know about digitalization	0.7	0.0	2.0	38.5	**58.9**
I need to adjust my business situation in line with today's digitalization era	0.7	0.0	1.3	33.8	**64.2**
I know the basic information and communication technology equipment	1.3	2.3	13.4	**50.5**	32.4
I know the software system that is in the information and communication technology equipment	1.7	3.0	30.4	**43.5**	21.4
I found out about web browsers (like Internet Explorer/Mozilla/Opera) and so on	3.3	12.7	29.1	**34.1**	20.7

I use at least one online marketing technology on social media such as (Instagram/TikTok/Facebook and so on) in my business	1.0	1.3	7.0	43.1	**47.5**
I use at least one simple order service technology through apps like 'WhatsApp/Telegram' in my business	0.7	1.7	3.0	38.1	**56.5**
I think the Information Technology System (ICT) taught by the Zakat Center makes it easier for me to convey business information to consumers	0.3	1.0	6.7	40.1	**51.8**
I think the website helps facilitate user access	0.3	1.3	2.7	37.8	**57.9**
The mean average of 299 respondents	**0.0**	**0.3**	**5.7**	**74.9**	**19.1**

The Relationship between Digitalization Technology and Business Innovation Model: Cross-tabulation analysis between Digitalization Technology and Business Innovation Model is shown in Table 3. 103 respondents expressed Agree with both the Digitalization Technology and Business Innovation Model. 119 respondents said they agreed with Digitalization Technology but said they strongly agreed with the Business Innovation Model. In the next way, we see the relationship between these two varieties with the following hypothetical statements:

H_0: There is no relationship between Digitalization Technology and the Present Business Innovation Model.
H_1: There is a relationship between Digitalization Technology and the Present Business Innovation Model.

The Chi-Square analysis found that Pearson's cynical value was at 0.00. It is at a level of less than 0.05, resulting in the meaning that this test successfully rejected H_0. It means that there is a relationship between Digital Technology and the Business Innovation Model. Any changes in Digital Technology will leave significant changes to the Business Innovation Model.

Table 3: The Relationship between Digitalization Technology and Business Innovation Model

		Digitalization Technology				
		Disagree	**Moderate**	**Agree**	**Strongly Agree**	**Total**
Business Innovation Model	Strongly Disagree	1	0	0	0	1
	Disagree	0	1	0	0	1
	Moderate	0	1	2	0	3
	Agree	0	11	103	3	117
	Strongly Agree	0	4	119	54	177
Total		1	17	224	57	299

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	359.661[a]	12	.000
Likelihood Ratio	70.118	12	.000

Linear-by-Linear Association	58.822	1	.000
N of Valid Cases	299		

a. 14 cells (70.0%) have expected countless than 5. The minimum expected count is .00.

5. Recommendations and Conclusion

Recommendation for Digitalization Technology Elements

Table 5: Digitalization Technology Elements with Ranking

Digitalization Technology Among Asnafprenuer	Strongly Disagree (%)	Agree (%)	Strongly Agree (%)	Ranking
I learned that the passage of time impacted my business	0.7	39.8	**53.5**	**5**
I feel I don't need to change anything to keep trading in this digital age	**31.1**	11.7	7.7	11
I need to take to know about digitalization	0.7	38.5	**58.9**	**2**
I need to adjust my business situation in line with today's digitalization era	0.7	33.8	**64.2**	**1**
I know the basic information and communication technology equipment	1.3	**50.5**	32.4	8
I know the software system that is in the information and communication technology equipment	1.7	**43.5**	21.4	9
I found out about web browsers (like Internet Explorer/Mozilla/Opera) and so on	3.3	**34.1**	20.7	10
I use at least one online marketing technology on social media such as (Instagram/TikTok/Facebook and so on) in my business	1.0	43.1	**47.5**	**7**
I use at least one simple order service technology through apps like 'WhatsApp/Telegram' in my business	0.7	38.1	**56.5**	**4**
I think the Information Technology System (ICT) taught by the Zakat Center makes it easier for me to convey business information to consumers	0.3	40.1	**51.8**	**6**
I think the website helps facilitate user access	0.3	37.8	**57.9**	**3**
The mean average of 299 respondents	**0.0**	**74.9**	**19.1**	

Table 5 illustrates that the foremost aspect in the domain of business is adapting to the digital era, as indicated by its highest ranking by asnafpreneurs. Following this, entrepreneurs must possess knowledge of digital technology as a secondary factor. Additionally, the utilization of a website can greatly aid in facilitating user interaction, serving as the third factor. To achieve success in entrepreneurial endeavors, all parties involved in the development of Malaysian asnafpreneurs must prioritize these aforementioned elements, in addition to the implementation of other related factors. The meaning and manifestations of entrepreneurship on a global scale have been profoundly transformed by the unparalleled digital revolution. The rapid advancements in the digitalization of our society and economy have outpaced the ability of the nascent field of technology entrepreneurship research to keep up (Giones & Brem, 2017). This is done to adapt to the platform economy and identify growth opportunities to sustain competitiveness (Vaska, Massaro, Bagarotto, & Dal Mas, 2021).

Furthermore, recent studies indicate that firms utilize external venturing modes, such as startup programs and accelerators, to cultivate dynamic capabilities (Enkel & Sagmeister, 2020). Consequently, digitalization is considered an entrepreneurial process as firms strive for digital transformation, rendering previously successful business models obsolete through implementing the business Innovation Model which is

revolutionizing various industries (Vaska et al., 2021). Digital technologies are intrinsically linked to strategic changes in business models (Sebastian et al., 2017), thereby necessitating the development of new business models (Hess, Benlian, Matt, & Wiesböck, 2016). This study will assist District or State Islamic Religious, Ministry of Entrepreneur Development and Cooperatives (MEDAC), Asnaf associations, Department of Islamic Development (JAKIM), and non-profit organizations in developing strategic guidelines to support asnafpreneurs in achieving the National Entrepreneurship Plan (NEP, 2030). This new hybrid model for halal business innovation among asnafpreneurs in the digital era aligns with government goals to achieve Sustainable Development Goals (SDGs).

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Perceived Organisational Support, Transformational Leadership and Organisational Performance: Perspectives of Hospitality Industry in Malaysia

Nor Sabrena Norizan[1*], Ahmad Fadhly Arham[1], Ahmad Firdhaus Arham[2], Fatanah Jislan[1], Siti Norashikin Bashirun[1]
[1]Faculty of Business and Management, Universiti Teknologi MARA, Melaka, Malaysia
[2]Centre for Liberal Studies, Universiti Kebangsaan Malaysia, Malaysia
*norsabrena@uitm.edu.my

Abstract: Leadership studies within the field of business research in Malaysia and around the globe are expanding rapidly but remain divided and inconclusive. The hospitality industry provides significant contributions to Malaysia's economy, reflecting its financial standing. Therefore, this paper intends to analyze the most recent research breakthroughs linked to transformational leadership and organizational performance in Malaysia's hospitality industry, as well as to put forward recommendations for potential mediating or moderating variables. Past literature confirms that practicing and exhibiting transformational leadership qualities is relevant for hospitality leaders. Furthermore, it suggests that transformational leadership dimensions may significantly contribute to organizational performance. Finally, this study concludes that POS could bridge the gap in existing research on the relationship between transformational leadership towards organizational performance. This study strongly postulates that by examining the role of POS in different contextual studies, it is highly anticipated that the direct links between transformational leadership and the performance of an organization can be enhanced. Furthermore, implications and recommendations are also discussed.

Keywords: *Perceived organizational support; transformational leadership; organizational performance; hospitality industry, Malaysia.*

1. Introduction and Background of Study

The onset of the COVID-19 pandemic occurred in December 2019 and has had a global impact on individuals. COVID-19 has presented itself as a notable illustration of a challenging business climate. It has become a tool for assessing business leaders' readiness and responsiveness to sustain business operations despite the obstacles in the environment. The outbreak of the pandemic has impacted organizational performance, prompting the firm to adopt proactive measures aimed at enhancing organizational performance (Wiradendi Wolor et al., 2020). Despite the anticipated impact on organizational performance, there has been a lack of efforts to examine how the styles of leadership could affect organizational performance within Malaysia's hospitality industry. The current study hypothesized that specific management leadership styles have the potential to yield a notable enhancement in organizational performance. It is observed that the hospitality industry has experienced the impact of globalization, digital technology, and the emergence of innovative service models. As a result, the hospitality industry has undergone significant shifts in its characteristics and dynamics, thereby necessitating a corresponding adaptation in leadership styles. Therefore, management style plays a crucial role in the hospitality industry in producing favorable employee outcomes.

In reality, the hospitality industry has a unique and distinct culture as compared to other industries. This service industry is characterized by frequent interactions with both customers and employees, with frontline personnel being of paramount importance in ensuring the effective delivery of the service (Terglav et al., 2016). The success of hospitality businesses is contingent upon the attitudes and behaviors of their employees (Ubeda-Garcia et al., 2014). According to several authors, hospitality industry employees encounter a deficiency in recognition, emotional exhaustion, occupational stress, excessive workload, and inadequate remuneration (Kim & Agrusa, 2011; Tongchaiprasit & Ariyabuddhiphongs, 2016). In addition, this particular industry has reported a notable incidence of employee absenteeism and turnover, which can be related to the fundamental features of its operations. As with other companies, the hospitality industry must acknowledge the significance of effective leadership and implement its principles to improve organizational performance. Failure to exhibit and exercise appropriate leadership practices may incur high costs for organizations. Adverse consequences, including high employee turnover, absenteeism, poor performance, and client discontent can greatly affect the sustained success of a hospitality organization, leading to substantial costs (Boger & Lim, 2005). This study

aims to examine how transformational leadership affects the realization of the full potential of hospitality employees.

The effective utilization of leadership style is a crucial management skill that has the potential to foster favorable employee interactions, improve performance, and increase customer service. Existing literature suggests the styles of leadership being practiced by leaders significantly affect the performance of the organization (Alamir et al., 2019). However, most of the outcomes of the research have been established within the Western context (Mangkunegara, 2016; Naeem & Khanzada, 2018). The selection of transformational leadership as the preferred leadership style may facilitate employee retention in the food and beverage industries. The transformational leadership practice has been proven to be beneficial in sustaining customer engagement and fostering innovation despite the challenges posed by transformation. The practice fosters a culture of experimentation, promotes innovative problem-solving techniques, and stimulates employees to transcend conventional thinking. This particular leadership style is customer-centric and encourages employees to devise customer-centric solutions.

The study's objectives are three-fold. Firstly, it intends to establish the need to exhibit transformational leadership within the hospitality industry. Secondly, it ascertains the potential effect of the dimensions of transformational leadership on employees within the food and beverages industry. Finally, it intends to observe the potential moderating effect of POS on the relationship between transformational leadership and the organization's performance. All of these objectives are proposed with the awareness that the current research on leadership within the hospitality industry in Malaysia is still lacking and the findings on the effects of transformational leadership on subordinates remain inconclusive (Hoch et al., 2018; Judge & Piccolo, 2004). There are a few that have established that individual and behavioral outcomes were impacted by transformational leadership (Gui et al., 2020 & Mohamed, 2016) and others have not observed such a relationship (Gu et al., 2017).

2. Literature Review

Leadership within the Hospitality Industry: Leadership is essential in influencing organizational performance and determining an organization's capacity to adapt to new circumstances (Bass et al., 2003). Thus, a specific leadership style might serve as an indicator of the organization's success (Arham, 2014a). Hence, the leadership styles exhibited are crucial in influencing the organization's growth and employees' performance. Leadership entails the identification of an organization's goal, the promotion of behavior that is conducive to its attainment, and the exertion of influence over group civilization and maintenance. Erkutlu (2008) asserted that there would be no leader without subordinates. According to the author, leadership is the act of exerting influence, providing encouragement, and granting permission to employees to facilitate their contribution to the organization's success and efficiency.

The significance of leadership in the hospitality industry has been established through various studies (Patiar & Wang, 2020; Koo et al., 2019; Jang et al., 2017). There is a notable connection between leadership styles and employees' well-being (Correia de Sousa & van Dierendonck, 2014). Additionally, the study highlights leadership has different effects on supportiveness and openness. Moreover, it has been observed that leaders tend to attain elevated levels of accomplishment by giving precedence to the work engagement of their subordinates, particularly in situations involving customer interaction (Barnes & Collier, 2013). Successful leaders can provide guidance that stimulates, possess the ability to offer the direction that motivates individuals to take action, cultivate innovativeness and make prudent decisions to help the team achieve their success (Bennet, 2009). However, leadership styles have been found to have had no significant impact during the COVID-19 pandemic (Mathende & Karim, 2021).

Yom and Gibbs (2021) postulated that the lack of significance could be attributed to various factors, including organizational, environmental, cultural, and situational circumstances. Transformational leadership can be implemented by all leaders within the organization. Teams led by transformational leaders achieve greater outcomes by enhancing and guiding the individual contributions of their members. Transformational leaders create significant changes in values, attitudes, behavior, emotions, and superior performance among subordinates (Effiyanti et al., 2021). Previous research has commonly employed Bass's (1985) model of

transformational leadership as a means of motivating personnel to surpass anticipated levels of performance. Still, past studies have identified certain constraints within his theoretical frameworks. Rafferty and Griffin (2004) found a lack of empirical evidence supporting the proposed factor structure model and the significant correlation between leadership components in their research. Similarly, several authors have made similar claims (Avolio et al., 1999 & Tejeda et al., 2001). Furthermore, Barbuto (1997) contended conceptual ambiguity between the dimensions of charisma and inspirational motivation of transformational leadership.

Transformational Leadership: The transformational leadership theory has undergone several modifications over three decades of scholarly inquiry. In recent years, there has been a proliferation of theoretical and empirical research on transformational leadership. Brown and Keeping (2005) define transformational leadership as a leader's ability to share a vision for the future of their subordinates, stimulate their intellectual faculties, and acknowledge the diversity among individual staff members. In addition, transformational leaders stimulate and influence subordinates to put aside their self-interests in favor of the greater good (Lord et al., 2017 & Banks et al., 2016). In the hospitality industry, transformational leaders focus on maintaining a good relationship with their employees, customers, and other stakeholders. Leaders who adopt a transformational approach in the hospitality industry are known to be resourceful to their employees to succeed. They prefer to cultivate employees' training and development and enable them to assume greater accountability and exert influence over customer experiences. Transformational leadership is linked to various individual and organizational outcomes such as performance, citizenship behavior, subordinates' satisfaction and commitment (Banks et al., 2016 & Alamir et al., 2019). However, subordinates' performance is the most crucial variable among the numerous outcome variables.

Bass's (1985) research on transformational leadership and organizational performance highlights that the implementation of this leadership approach results in employees exceeding performance expectations. According to the author, the implementation of transformational leadership may eventually result in extraordinary performance from subordinates. Overall, transformational leadership is a powerful tool in the hospitality industry because it facilitates the establishment of a positive work culture, fosters employee motivation and engagement, and enhances the quality of the customer experience. Although the literature highlights theoretical and practical studies on transformational leadership and organizational performance, further research is still required to comprehend and predict this correlation fully. Insufficient scholarly attention has been devoted to the fundamental mechanism that governs the correlation between the aforementioned variables; thus, scholarly inquiries are necessary to elucidate this matter (Wang et al., 2013). Furthermore, it is imperative to examine the pertinent factors that influence the correlation between transformational leadership and organizational performance (Han et al., 2020). This study suggests a transformational leadership model that Rafferty and Griffin (2004) developed in response to the shortcomings of the previous model. This transformational leadership model appears to possess a greater degree of practicality and thoroughness due to its incorporation of five distinct dimensions: vision, inspirational communication, intellectual stimulation, supportive leadership, and personal recognition (Rafferty & Griffin, 2004).

Transformational Leadership Dimensions: According to Rafferty and Griffin (2004), the transformational leadership model should comprise five dimensions as follows:

Vision: This dimension has been highlighted as one of the factors that can help increase organizational performance. Organizations necessitate leaders with a crystal direction, as they are capable of effectively conveying their expected future accomplishments to their subordinates. According to Rafferty and Griffin (2004), the attribute of vision is encompassed within the wider construct of charisma, which is regarded as a key trait of effective leadership. The recurrent matter of charisma pertains to the importance of defining vision. Charismatic leaders demonstrate behaviors such as effective communication and a strong conviction that enhances clarity of goals, attention to tasks, and alignment of values (House, 1977). The current study has established the definition of vision as proposed by Rafferty and Griffin (2004), which describes it as a representation of an idealized future state that is grounded in the values of an organization.

Inspirational Communication: Researchers have used a variety of perspectives in the past to define the concept of inspiration. Inspiration has been described as the force that moves the mind or emotions (Downton,

1973). On the contrary, Bass (1985) described inspiring leadership as when a leader uses emotional traits in the influencing process Bass added that inspirational leaders employ inspirational presentations and emotional appeals to add affective characteristics to the influence process. These definitions reveal a recurring usage of oral communication in the context of inspirational communication, which Rafferty and Griffin (2004) decided to focus on. Inspirational communication is defined by the authors as positive and encouraging messages and statements about the organization that enhance employee motivation and confidence.

Intellectual Stimulation: According to some authors, this dimension is the most important element of transformational leadership (Lowe et al., 1996). This attribute involves behaviors that cultivate subordinates' interest and knowledge regarding various issues and their ability and inclination to address them using diverse approaches (Bass, 1985). Transformational leaders consistently promote, demonstrate, support, and seek innovative problem-solving solutions from all members of the organization through continuous intellectual stimulation. In the current study, the term "intellectual stimulation" is defined as enhancing the cognitive abilities of subordinates to generate innovative solutions to problems while concurrently augmenting their awareness and inclination towards problem-solving. In addition, the benefit of intellectual stimulation can increase subordinates' capacity to conceptualize, interpret, and evaluate issues, as well as improve the value of results (Bass & Avolio, 1990).

Supportive Leadership: This dimension emphasizes individual consideration. The authors argue that supportive leadership - a leader's behavior that shows concern for their subordinates' well-being—is essential to transformational leadership. This study supports Rafferty and Griffin's (2004) definition, which emphasizes subordinates' requirements for attention and care. Supportive leadership involves friendly and approachable traits that provide employees with social-emotional, material and informational resources, showing respect and care for the well-being of employees (Bass, 1990; Oldham & Cummings, 1996). Besides being the subject of interest in various fields, including management, public administration, and industrial and organizational psychology, supportive leadership has been shown to affect employee performance significantly.

Personal Recognition: The final dimension encompasses the contingent reward aspect associated with transformational leadership. Personal recognition pertains to leaders' exhibiting acknowledgment for their subordinates' efforts and granting them incentives in accordance with accomplishments that align with the primary vision. In accordance with the definition by Rafferty and Griffin (2004), the current study defines this dimension as the provision of incentives, such as commendation and appreciation of effort, for accomplishing organizational targets. Many organizations currently use personal recognition to encourage and motivate employees to achieve high performance and productivity (Amoatemaa & Kyeremeh, 2016). Personal recognition has been identified as a contributing factor in enhancing employee motivation toward the accomplishment of organizational goals (Imran et al., 2014).

Organizational Performance: Before the rapid technological progress and intense competition in the corporate landscape, research has underscored the necessity of enhancing organizational performance and long-term viability through the establishment of effective leadership and the optimal use of resources, including human capital (Le & Le, 2021). Organizational performance is a factor that contributes to an organization's success. In addition, sustaining high levels of performance can help improve the quality of services and goods, boosting the firm's competitive advantage (Scotti et al., 2007). Consequently, improving performance is crucial for organizations that aim to ensure their survival and achieve sustainable growth.
According to Judge (2011) and Lei and Le (2019), leadership is a factor that influences organizational performance.

Previous research argues that, among dominant leadership styles, transformational leadership is the most effective as it brings the organization numerous essential benefits and a variety of significant results (Garcia-Morales et al., 2008; Yang et al., 2018 & Son et al., 2020). Son et al. (2020) mentioned that transformational leadership encourages people to attain the highest organizational and managerial performance levels. Furthermore, Garcia-Morales et al. (2008) indicated that high organizational performance is driven by an environment where transformational leadership is applied and practiced correctly. The current study seeks to propose the introduction of a moderating variable to the aforementioned relationship. This involves an analysis

of contemporary research on transformational leadership and its impact on organizational performance in the hospitality industry. The findings of this study are organized and presented in the table below.

Table: Research on Transformational Leadership and Organisational performance (2019–2023)

No.	Author/Year	Journal	Findings	Future Research
1	Nguyen et al. (2023)	IIMB Management Review	These authors investigated the effect of TL, organizational culture, and OP among 903 employees within the Vietnam manufacturing industry. The study showed organizational culture mediated the relationship between TL and OP.	It is recommended that future research investigate the individual effect of TL on OP. Secondly, it is suggested that other mediating variables should be used in explaining the links between TL and OP. Finally, future studies should consider different industries.
2	Aftab et al. (2023)	Journal of Hospitality and Tourism Insights	These authors examined the role of work engagement in the relationship between TL and job performance among 360 employees. It is found that TL is related to job performance and work engagement.	Future studies should be conducted in settings other than hotels in Italy to ensure the data can be generalized to other settings.
3	Sudha et al. (2023)	International Journal of Public Sector Management	These authors included the effect of organizational commitment as the mediator between TL and job performance in the Maldive civil service. The result found that there was no relationship between TL and job performance, but there was a small mediation effect between the variables.	It is recommended to employ stratified random sampling to evaluate the impact of transformational leadership on various organizational levels, and to determine which level has a much greater impact.
4	Mohammed & Al-Abbrrow (2023)	International Journal of Organisational Analysis	These authors intended to assess the impact of TL on OP, considering shared leadership as a mediator and organizational culture as a moderating component. It used a quantitative technique, and the data was acquired from 301 personnel in the health sector. The finding indicated that all correlations were significant and underlined the importance of mediating variables.	It is suggested that future studies should involve employees working at different levels in the organization. Besides that, it is recommended that future studies test other leadership styles.
5	Teoh et al. (2022)	Frontiers in Psychology	These authors investigated the dimension level of TL and performance in the Malaysian hospitality industry. The data was obtained from 400 employees in the Malaysian industry and analyzed by using PLS-SEM. The study found that idealized influence and inspirational motivation significantly influenced employee performance	Future studies are recommended to compare the differences across cultures and nations since this study was conducted only in Malaysia. Besides that, it was suggested that future research should use longitudinal rather than cross-sectional research.

			out of the four dimensions proposed.	
6	Jiatong et al. (2022)	Frontiers in Psychology	These authors determined the impact of TL, organizational commitment, and OP in the affective domain. Respondents were employees working in China, and the data was assessed by using SEM. The result indicated that the relationship between TL and OP was mediated by employee engagement.	Future studies are expected to test the relationship between variables using different samples. Additionally, future research could compare different leadership styles regarding OP and employee engagement.
7	Puni et al. (2022)	Leadership and Organisation Development Journal	Their study examined the mediating role of innovative climate, TL and OP in Ghana. The data in this study was analyzed by using SPSS. The finding showed that TL significantly affected firm performance, and an innovative climate was a significant mediator in this relationship.	It is recommended for future studies to incorporate different leadership styles, to consider different industries and to encourage cross-country cultural differences.
8	Budur & Demir (2022)	Iranian Journal of Management Studies	Their study examined the effect of TL and employee performance and organizational citizenship behaviors as the mediator. It was conducted among SME employees in Iraq. They reported that inspirational motivation significantly and positively affected employee performance. Additionally, it was found that OCB partially affected employee performance, while courtesy and conscientiousness significantly and positively impacted employee performance.	It is suggested that future research consider a similar model in a different cultural setting. The researchers also suggested that future research should test different leadership styles in measuring employee performance and OCB.
9	Firmansyah et al. (2022)	Cypriot Journal of Educational Sciences	These authors conducted a meta-analysis approach to integrate the findings from 65 separate studies and concluded that in terms of average influence, "transformational school leadership" positively influenced teacher performance.	It is recommended that future studies include situational aspects to establish a clear overview of "transformational school leadership" and how it could affect teacher performance.
10	Hilton et al. (2021)	Management Research Review	In their study, job satisfaction has been adopted as the moderator of the relationship between TL and OP. Employees in selected commercial banks in Ghana were taken as samples. The results indicated that individualized consideration has the most significant impact on OP. Moreover, job satisfaction	Future research should include other leadership styles and conduct the same study in different contexts.

			mediated the interaction between these variables.	
11	Dahleez & Abdelfattah (2021)	International Journal of Productivity and Performance Management	This study examined the correlation between TL and OP, taking into account the moderating influence of market orientation. The data was gathered from personnel employed in Omani SMEs and examined using SEM and AMOS. The results demonstrated a direct correlation between TL, OP and market orientation.	Future studies may compare outcomes based on the data collected from developing countries. Besides that, future research should test other types of intervening variables when studying organizational performance.
12	Effiyanti et al. (2021)	Journal of Asian Finance, Economics, and Business	The study examined how TL influences OP, with readiness to change and empowerment of knowledge sharing acting as mediating factors. The participants in this study were personnel of the National Agency of Drug and Food Control in Indonesia. The study indicated that TL was a strong predictor of preparedness for change and enhanced the quality of knowledge-sharing, which has a major impact on OP.	It is recommended that future research consider sampling sites other than public service organizations. Besides that, future studies are encouraged to consider proper TL program strategies and implementation to improve OP.
13	Le & Le (2021)	Psychology Research and Behaviour Management	These authors have included organizational change capability as a mediator in the relationship between TL and OP among Vietnamese firms. This study used AMOS and SEM to analyze the relationship between the proposed variables. The finding showed a significant influence of TL on organizational change capability and performance.	Future research should use a longitudinal approach, as this study only used a cross-sectional design. Besides, it is suggested that future research include respondents from a different context.
14	Rawashdeh et al. (2020)	International Journal for Quality Research	These authors investigated the effect of TL and OP and considered the mediating role of quality innovation. The quantitative data was collected among middle-level leaders and analyzed by using IBM AMOS 22. The finding showed that TL was significantly related to OP and quality innovation.	It is suggested that future research conduct exploratory research on OP in different industries and use different samples.
15	Jensen et al. (2020)	European Management Journal	These authors used a mixed-method approach to investigate the effect of TL and OP. The study was conducted among CEOs of publicly listed US and European companies. The findings of this research revealed a significant relationship between intellectual	Future research should be conducted in other countries, such as Asia and Australia. Additionally, future research should replicate this study by using secondary sources of CEOs' TL annually.

			stimulation, inspirational motivation, and OP, thus supporting the positive role of CEO TL in OP.	
16	Jnaneswar & Ranjit (2020)	Journal of Advances in Management Research	These authors investigated the relationship between TL and OP by including the mediating effect of corporate social responsibility. The data came from employees working in the manufacturing industries in India. Besides that, the PROCESS macro was used to analyze CSR's mediating effect. The result supported that TL affected OP and CSR. In addition, there was a partial mediation of CSR in the relationship between TL and OP.	Subsequent investigations must consider broadening the scope of the study by gathering data from various sources and employing a longitudinal methodology to ensure the generalisability of the results to different contexts.
17	Anselmann, & Mulder (2020)	Journal of Nursing Management	These authors identified the relationship between TL, knowledge sharing and reflection, a safe team climate and team performance among nursing and social work teams. In this cross-sectional study, data were analyzed using SEM. This study found that TL influenced team performance among nurses and social workers. Furthermore, this study suggested that TL could establish a safe environment in a work team, which in turn will improve team learning and OP.	
18	Lai et al. (2020)	Sage Open	These authors used a multitemporal and multisource research design to confirm the relationship between TL and OP, with the mediating role of work engagement. It was conducted among nurses, and hierarchical linear regression was used to analyze the data. They found that work engagement mediated the positive relationship between leadership, OP and helping behavior.	It is suggested that future research should consider examining more beneficial outcomes of TL. Besides that, the authors indicated that data collection could be made from different occupations and sectors.
19	Bastari et al. (2020)	Management Science Letters	This study investigated the relationship between TL style and OP, with job motivation as the mediator. The respondents to this research consisted of the employees working at PT. Kereta Api Indonesia. The findings revealed that TL significantly affected employee performance,	

			with job motivations as the mediating variable. Besides that, findings showed that employees' job motivation also significantly affected OP.	
20	Nguyen & Luu (2019)	Economics & Sociology	These authors studied the significant effect of TL and OP performance among manufacturing firms in Vietnam. The finding revealed that TL significantly affected organizational performance through learning, innovation, and culture. In addition, the data were analyzed by using AMOS and SPSS to assess the relationship between latent variables.	Since this research used CEOs as respondents, it is suggested that future research use subordinates or immediate leaders to achieve accurate results. In addition, this study also proposes that future research explore additional variables that could influence the relationship between TL and OP in various settings.
21	Atan & Mahmood (2019)	Management Science Letters	This quantitative study examined the role of TL in enhancing employee competency for OP. It was conducted among supervisors working in the food manufacturing industries. The data in this study were analyzed using SPSS and PLS-SEM. The findings indicated that TL significantly affected OP.	This study recommends that future research incorporate samples from many industries to enhance its generalisability.
22	Matar et al. (2019)	International Journal of Recent Technology and Engineering	These authors identified the impact of TL on OP among government employees working in Dubai. PLS-SEM was used for data analysis. The result indicated that the four elements of TL significantly predicted employee performance.	Future research should include various samples from many sectors to increase its generalisability.
23	Manzoor et al. (2019)	Sustainability	These authors examined the relationship between TL and OP. Corporate social responsibility was taken as the mediating variable. It was conducted among employees working in SMEs in Pakistan. The findings revealed that TL was a predictor of OP. Additionally, corporate social responsibility mediated this relationship.	Future research could use a longitudinal study technique to present the research model. Also, it is suggested that future research extend the study by involving other organizations in different countries.

Notes: Transformational leadership (TL); Organisational performance (OP).

Table 1 highlights research that has been conducted on transformational leadership and organizational performance from 2019 to 2023. A meta-analytic approach was used to establish links between transformational leadership and organizational performance. The meta-analytic approach was vastly employed to analyze and synthesize literature (Ali et al., 2019; Bastari et al., 2021). All articles were obtained by searching the Scopus database using the terms "transformational leadership," "performance", and "Malaysia." The literature search has yielded 219 articles. Out of 219 articles, only 70 were on the study area topic. Unfortunately, this study only kept 24 articles because they fulfilled the research criteria. The results

shown in Table 1 confirm that the majority of past research has established that transformational leadership is associated with organizational performance.

Consequently, the incorporation of transformational leadership characteristics into organizational operations results in increased job satisfaction among employees, ultimately leading to enhanced organizational performance. In addition, it was found that numerous researchers had conducted investigations on the relationship between transformational leadership and performance across various contexts and industries, as depicted in Table 1. presented earlier. Despite the recognition of hospitality employees as the hotel's most distinctive and significant asset and the most expensive investment, the hospitality industry has not received adequate empirical attention (Hwang et al., 2021). Furthermore, most earlier studies on transformational leadership and organizational performance have included mediating variables, with only a few studies analyzing the moderating effect between the variables. Therefore, this study anticipated that the inclusion of POS as the moderating variable could help improve organizational performance in Malaysia's hospitality industry.

The Relevance of Transformational Leadership on Organisational Performance: The data reported in Table 1 indicates a correlation between transformational leadership and organizational performance, which exhibits both direct and indirect effects (Atan & Mahmood, 2019; Khan & Adnan, 2014 & Overstreet et al., 2014). Transformational leadership is a multifaceted notion linked to organizational success because of its association with being forward-thinking, open-minded, and proactive (Bass, 1985; Howell & Avolio, 1993). In addition, Table 1 demonstrates that studies have been conducted across many sectors, indicating a significant correlation between transformational leadership and organizational success. Chai et al. (2017) suggested that transformational leadership can enhance organizational performance by including employees in decision-making, boosting their performance, and laying the groundwork for achieving the organization's objectives.

Perceived Organisational Support as the Moderating Variable: The third objective of this study is to evaluate the potential influence of POS as a moderating variable in the link between the factors mentioned above. Based on Blau (1964) and Gouldner (1960), POS refers to the perception of employees towards organizational support and care. Based on the organizational support theory (Eisenberger et al., 2001), while delivering the organization's expectations, reciprocally employees assess how their organization appreciates their efforts and are concerned about whether their well-being is looked after. The notion of POS elicits a sense of duty to reciprocate the advantageous treatment that has been bestowed upon an individual. Many studies have reported the positive outcomes of POS for the organization, such as affective commitment, career satisfaction, intention to stay, and organizational performance (Kurtessis et al., 2017 & Jeung et al., 2017). However, despite the immense contribution to transformational leadership and organizational performance literature, there is scant empirical evidence on how POS moderates this relationship, especially within the scope of this study. Table 1 reveals a lack of studies that incorporate moderating variables in the correlation between transformational leadership and organizational performance. Due to the inconsistencies of findings established, this study postulates POS as the moderator that will strengthen the existing association between transformational leadership and organizational performance.

3. Research Methodology

This study will employ a cross-sectional design, and a self-administered questionnaire will be distributed among employees working in the food services sub-sector in Malaysia. Explanatory study is chosen for its capacity to clarify the connection among independent, dependent, and moderating variables. Zikmund et al. (2010) recommend using this research design as the data to be collected is singular in nature.

Sample and Procedure: The data of this study will be collected data from full-time employees in the food and beverage business in the Klang Valley, which has the highest employment rate in the services sector (DOSM, 2022). Thus, it indicates that this industry is significant to the Malaysian economy. The record also indicated that between the three sub-sectors of the food and beverage industry, the food services sector employed the highest number of employees with 758,992, as compared to event catering services with 106,701 and beverage with 93,110 (DOSM, 2019).

Measures: The study aims to assess the correlation between transformational leadership styles and organizational performance in the hospitality sector through the use of a survey questionnaire. The scales employed in this study will be derived from prior research. The questionnaires will employ a 5-point Likert scale, where scale 1 will denote the response option of "strongly disagree," and scale 5 will denote the response option of "strongly agree." For the transformational leadership measurement items, the questionnaires will be adapted from Rafferty and Griffin (2004). The five dimensions of the transformational leadership scale included vision, inspirational communication, intellectual stimulation, supportive leadership, and personal recognition. For organizational performance, the items will be adopted from Janssen and Van's (2004). The questionnaires will include inquiries regarding the completion of job duties as outlined in the employee's job description and the fulfillment of performance requirements by the employee. Finally, for the moderating variable, the shortened version of the Survey of POS by Eisenberger et al. (1986) will be adopted. Considering the possibility of common method bias, this study will exercise the recommended approach by Podsakoff et al. (2003), which involves incorporating reverse items into the questionnaire and randomizing the order of items within the questionnaire.

Data Analysing Strategy: For data analysis, Statistical Package for Social Science (SPSS) 26.0 and Smart PLS-SEM will be employed. SPSS will be used to extrapolate data and assess data normality, as well as to assess the demographic profiles of the respondents. Furthermore, as this study attempts to identify the key driver constructs of transformational leadership on organizational performance, PLS-SEM 3.0 has been chosen as the software for assessing the relationship between variables. The measurement model will be evaluated by defining the measurement and structural models. The reflective model demonstrates the connection between constructs and their associated indicator variables, while the structural model explains the connections between constructs (Hair et al., 2017). The reflective measurement model will undergo three assessments: internal consistency, convergent validity (indicator reliability/outer loading and average variance extracted), and discriminant validity. Then, this study will evaluate the structural model through six stages: investigating collinearity difficulties, evaluating the significance and relevance of structural model relationships, and measuring R2, f2, predictive relevance, Q2, and q2 effect size.

4. Discussion

This study aims to analyze the correlation between transformational leadership and organizational performance, as well as explore the potential moderating impact of POS on this relationship. Past studies indicate that leaders who possess a well-defined vision exert a beneficial and noteworthy influence on the employees (Alamir et al., 2019 & Banks et al., 2016). Therefore, it is proposed that leaders express a concise and unambiguous vision to their workforce because sharing future visions with the employees motivates them to work hard to achieve the company's goals and objectives. Furthermore, when employees are provided with a clear vision, they will have confidence in the organization's long-term survival and growth. Similarly, Kantabutra (2010) agreed that organizational leaders should formulate a clear and brief vision to provide instruction. When the shared vision is apparent, employee satisfaction increases, leading to improved organizational performance.

Transformational leadership primarily centers on organizational performance, as past findings have demonstrated that this style of leadership is a substantial predictor of various job-related outcomes (Buil et al., 2018). While transformational leadership has received substantial investigation in Western culture, further research in other cultures, such as Malaysia, is required to determine whether it is a universal leadership style. A comparative analysis of transformational leadership across diverse cultures can shed light on how culture influences the effectiveness of leadership styles. Moreover, with the growing prevalence of technology and remote work, it is essential to investigate how transformational leadership can be adapted to the digital age. Thus, this study could investigate how leaders can utilize digital tools to engage and inspire their subordinates and how the absence of face-to-face interaction impacts the effectiveness of transformational leadership. Ardi et al. (2020) state that transformational leadership in the digital age should understand digital advancements and have a role in initiating change.

Theoretical Contribution: Despite significant evidence supporting the idea that transformational leaders enhance subordinates' performance, a recent study yielded conflicting outcomes. By using samples from

employees from the food and beverages sector, this study will examine how transformational leadership influences organizational performance. It aligns with the meta-analyses in Table 1.1, which synthesize the results of prior research on these two variables. Furthermore, this study aims to enhance the existing literature on leadership and hospitality by deepening the authors' comprehension of the correlation between transformational leadership, employee performance, and their underlying mechanisms. Even though, the interest in studying transformational leadership on organizational performance is increasing, this study will contribute theoretically to the application of this leadership style within the context of Malaysia, especially in the food and beverage sector. The inclusion of POS as the moderator is expected to fill the gap in the existing literature and build up a new theoretical foundation in enhancing the performance of the organization in the Malaysian food and beverage industry.

Practical Contribution: This study has important implications for practitioners. The study could provide several real-world results for hospitality executives and managers. Leaders in Malaysia's hospitality industry will be informed that they must demonstrate and practice transformational leadership to increase organizational performance. The advantage of having transformational leaders in the organization is that they may encourage employees to collaborate to achieve the organization's overarching goals. Furthermore, as indicated by previous literature and the outcomes of this study, the function of transformational leadership is critical to enhancing subordinate performance. They may affect outcomes at both the human and organizational levels, and transformational leaders enable organizations, particularly those in the food and beverage industry, to achieve their objectives in a competitive environment (Lin et al., 2016). This is due to transformational leaders' efforts to ensure consistency between subordinates' work and organizational responsibilities, which results in greater motivation (Zhu et al., 2013).

5. Conclusion

The establishment of the organization is intended to attain the requisite level of organizational performance. Hence, the principal objective of leaders who adopt a transformational leadership approach is to promote effective organizational performance. The present study contributes comprehension of the underlying mechanisms of transformational leadership specifically in the hotel industry. The meta-analysis conducted also indicated the current research on transformational leadership and organizational performance. The analysis highlighted the need to explore potential intervening variables that could enhance the relationship between those two variables. Moreover, the current study provides insights into the effectiveness of transformational leadership in enhancing organizational performance within the food and beverage industry in the 21st century. For the future direction of research, this study would recommend the inclusion of other leadership styles too. Resilient leadership and digital leadership are the two recent styles of leadership that have received greater attention in the body of knowledge. Perhaps, exploring the intertwining relationship between any of these styles against POS and organizational performance might provide different perspectives for scholars and practitioners. To conclude, the practice of transformational leadership can prove to be a highly effective leadership strategy for managers operating within the hospitality industry. Leaders who exhibit and practice transformational leadership attributes are expected to improve organizational performance by means of inspiring, coaching, empowering, establishing relationships, and fostering organizational performance. Finally, the current study posits that POS could be taken as the intervening variable that could strengthen the links between transformational leadership and organizational performance.

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A Conceptual Framework on Factors Influencing Nurses' Job Performance

Rabiatul Adawiyah Ma'arof[1*], Umi Kartini Rashid[2] & Juzaimi Nasuredin[2]
[1]Faculty of Business and Management, Universiti Teknologi MARA (UiTM), Cawangan Terengganu Kampus Dungun, Terengganu, Malaysia
[2]Faculty of Technology Management and Business, Universiti Tun Hussein Onn Malaysia, Parit Raja, Batu Pahat, Johor, Malaysia
radawiyah@uitm.edu.my*, kartini@uthm.edu.my, juzaimi@uthm.edu.my

Abstract: The nurses' job performance can be regarded as a reflection of healthcare organizations, given that they comprise the largest group of human resource professionals who are responsible for providing high-quality care to patients. However, previous studies have emphasized that nurses in Malaysia are underperformed because of shortages in the workforce and excessive workload. Hence, understanding factors influencing the job performance of nurses will empower decision-makers to develop effective strategies aimed at enhancing nurses' performance. In Malaysia, only a few research have been performed on job performance, especially among nurses. Furthermore, limited research has delved into the specific factors influencing nurses' job performance in Malaysia's public hospital system. This study contributes to the existing knowledge by investigating the impact of spirituality at work and HRM practices on the nurses' job performance in Malaysian public hospitals. This study employs a quantitative survey method using self-administered questionnaires, and the data collected will be analyzed using SPSS software Version 26. A total of 375 nurses from a population of 12, 514 nurses who worked at public hospitals in Malaysia will be selected as a sample of the study. This study offers potential benefits to authorities in Malaysian healthcare organizations by providing valuable insights for the development of compelling effective spirituality at work values and human resource management strategies aimed at enhancing the job performance of nurses.

Keywords: *HRM practices, Nurses' Job Performance*, *Spirituality at work, Social Exchange Theory, public hospitals*.

1. Introduction and Background

The healthcare sector, especially within the public sphere, plays a central function in safeguarding the overall welfare of the nation's populace. In Malaysia, public healthcare is a key factor in Malaysia's healthcare landscape, and the performance of nurses is paramount to its success in delivering services. The public healthcare system in Malaysia is widely acknowledged for its ability to provide essential medical services to the diverse population of the country. In fact, according to the data reported by the Malaysian Ministry of Health (MOH) in 2021, the number of patients admitted to public hospitals reached 2,284,303 during the year 2020, while private hospitals recorded 916,294 patients admitted during the same year (Ministry of Health, 2021). As a result, this has created a substantial burden on nurses in public hospitals, which is reflected in increased workloads and extended working hours (Zakaria, et al., 2021). Additionally, a study by Manogaran and Muthuveloo (2019) revealed a significant decline in the performance of nurses within the healthcare sector in Malaysia. The poor performance of nurses has a direct impact on the effectiveness of healthcare provision and the standard of patient care (Russeng, et al., 2020). In Malaysia's context, several researchers are actively investigating factors affecting nurses' job performance in Malaysia's private healthcare sector. For instance, a study by Nasurdin et al. (2020) explored this among 639 nurses working in private hospitals.

Similarly, Nasurdin et al. (2018) investigated factors affecting nurses' performance in nine privately owned hospitals. In addition, Mahat, et al. (2018) conducted a study at the Universiti Kebangsaan Malaysia Medical Centre. Meanwhile, research by Arshad et al. (2016) and Hee et al. (2016) focused on nurses in Mawar Renal Medical Centre and health tourism facilities respectively. Nevertheless, it is worth noting that the research has exclusively been conducted inside the confines of privately owned healthcare facilities. According to Johari et al. (2019), there remains a dearth of studies on job performance among public service employees, despite the scholarly consensus regarding the importance of studying job performance within the public service sector (Garg & Rastogi, 2006), particularly for nurses. At the same time, while research has explored various factors that influence employee performance, specific gaps exist in understanding the factors affecting nurses' job

performance remain limited (Mousa, 2020). Furthermore, prior research on job performance within the nursing profession has mostly concentrated on several variables, including human resource practices (El-Gazar & Zoromba, 2021; Nasurdin et al., 2020), psychological capital (Nasurdin et al., 2018), motivation (Gunawan, Hariyati, & Gayatri, 2019), job satisfaction (Safarpour, Sabzevari, & Delpisheh, 2018), job characteristics (Mahat, et al., 2018), leadership (Trichandhara, Somrongthong, & Rinthaisong, 2019), and working condition (Cho & Han, 2018) as factors influencing job performance among nurses. Garg and Rastogi (2006) assert that the enhancement of the job performance of employees is influenced significantly by two internal aspects: spirituality at work and HRM practices. Several studies point towards the potential benefits of spirituality at work and effective HRM practices in organizations. Hisam and Sanyal (2021) and Wagner, Brooks and Urban (2018) suggested considering spirituality at work as a crucial factor in cultivating a healthcare environment that is conducive to well-being and productivity, leading to positive outcomes such as improved job performance among employees. Additionally, Nasurdin et al., (2020) and Vivek (2019) claimed that the implementation of HRM practices has the potential to enhance employee job performance by increasing motivation and providing more performance opportunities. Hence, this study employs a comprehensive approach and examines the impact of spirituality at work and HRM practices on the nurses' job performance in public hospitals in Malaysia. Furthermore, the presence of spirituality at work becomes evident as a coping strategy that can aid employees, especially nurses, in dealing with stress.

Spirituality in this context can function as a personalized approach for regulating individual conduct within the professional setting (James, Miles, & Mullins, 2011). According to Ashmos and Duchon (2000), the integration of spirituality at work provides nurses with an opportunity to cultivate a sense of purpose in their professional roles by fostering a supportive community atmosphere where they can align their inner selves. In fact, the studies conducted by Kouhdasht et al. (2019) as well as Reutter and Bigatti (2014) have revealed a significant correlation between increased workplace spirituality, and a decrease in perceived occupational stress and improved psychological well-being. Nevertheless, there are limited studies exploring spirituality in healthcare settings and among nurses (Wagner et al., 2018). Consequently, researchers such as Hisam and Sanyal (2021) and Belwalkar, Vohra, and Pandey (2018) have reached the consensus that there is a need for empirical research on spirituality at work and to ascertain its potential association with employee behaviors. In the same line, the effective administration of human resources plays a pivotal role in exceptional patient care.

The HRM practices have a crucial role in fostering employee engagement (Ooi, Ng, Heng, Chua, & Lim, 2022), cultivating job satisfaction (Mohd Noor, Wan Razali, & Mutalib, 2022), and strengthening employee retention (Halid, Kee, & Rahim, 2020). Consistent with this viewpoint, Wright, McMahan, and McWilliams, (1994) have argued that organizations utilize HRM practices to shape employee perceptions, attitudes, and behaviors, all with the ultimate objective of enhancing performance. In fact, according to Pamungkas and Wulandari (2021), employees are more inclined to exert their utmost efforts and passion towards improving the quality of service rendered when they believe that their organization appreciates them and implements efficient HRM practices. However, research specifically investigating the influence of HRM practices on job performance within the healthcare sector remains scarce (Kusu & Gowtham, 2020) even though previous researchers such as Alghnimi, Habeeb, and Kadhim (2020) and Vivek (2019) acknowledge the influence of HRM practices on job performance is certainly influenced by certain HRM practices. In summary, the scarcity of research conducted in developing countries, particularly in Malaysia, relating to the interaction between spirituality at work, HRM practices, and job performance, provides an interesting foundation for performing this study. Therefore, the objective of this study is to investigate the link between spirituality at work and HRM practices on nurses' job performance in public hospitals in Malaysia.

2. Literature Review

Job Performance: In the contemporary business landscape, job performance works as a cornerstone in organizational psychology and management, playing an important role in contributing to the overall performance of the organization. The existing body of literature has presented a wide range of characterizations of the concept of job performance. Historically, researchers such as Rotundo and Sackett (2002) have evaluated job performance by considering both the quantity and quality of effort. Unlike previous theories, Campbell (1990) and Murphy (1990) believe that employee performance encompasses behaviors and activities that directly contribute to an organization's goals. Mahmoud and El-Sayed (2016) support this view,

suggesting that job performance can be used to develop employee traits like behaviors, attitudes, and characteristics that improve organizational output and adherence to established criteria. In addition, the job performance of nurses holds substantial significance within the healthcare sector. As stated by Greenslade and Jimmieson (2007), the attitudes and behaviors exhibited by nurses have a pivotal role in influencing the overall quality of healthcare service delivered to patients. Within this particular work, the evaluation of nurses' job performance is predicated upon their ability to proficiently execute their assigned duties and obligations, which have a direct influence on the attainment of optimal patient care standards (Abu AlRub, 2004; Asiamah, Mensah, & Ocra, 2019).

Nonetheless, previous scholars have made valuable contributions to the understanding of job performance by broadening its definition to encompass behaviors that facilitate the completion of essential professional tasks. Campbell (1990) made a significant contribution by proposing a classification of job performance that includes eight discrete elements. These elements consist of non-job-specific task proficiency, job-specific task proficiency, personal discipline maintenance, written and oral communication skills, demonstration of effort, facilitation of peer and team performance, administration, and leadership. Expanding upon the existing paradigm, Borman and Motowidlo (1993) introduced an additional categorization within job performance, distinguishing between two distinct theoretical domains: task performance and contextual performance. The viewpoint presented, which is backed by prior scholars like Motowidlo and Van Scotter (1994) and Rana, Pant, and Chopra (2019), argues that job performance is a multifaceted concept that requires evaluation using task and contextual performance. According to Borman and Motowidlo (1997), the inclusion of both components of performance is essential for attaining organizational goals. Task performance is viewed as specific behaviors that are required for the successful completion of job tasks or the technical core of an organization. Conversely, contextual performance plays a pivotal role in establishing the organizational, social, and psychological context inside an organization. Meanwhile, within the nursing profession, the evaluation of nurses' performance includes the consideration of both task performance and contextual performance. The use of a holistic approach is crucial due to the wide array of behaviors that are inherent in nursing positions (Tong, 2018; Greenslade & Jimmieson, 2007).

Spirituality at Work: In current years, there has been a notable surge in interest surrounding the notion of spirituality at work. Organizations are giving more importance to taking care of their employees' overall well-being. Nowadays, employees want more than just a paycheck. They also want to feel like their work is meaningful and fulfilling (Sony & Mekoth, 2019). According to Bharadwaj and Jamal (2020), when employees find jobs that match their spiritual values, they feel a deeper connection with themselves and a sense of purpose. This can help them do their jobs better and reach the organization's goals. Spirituality at work, as described by Mitroff and Denton (1999), involves finding purpose in one's work, building positive work connections, and aligning personal values with organizational values. Similarly, Ashmos and Duchon (2000) define spirituality at work as a sense of purpose, valuing one's work, and feeling connected to the workplace community. Therefore, spirituality at work typically revolves around meaningful work, a sense of community, and inner life (Belwalkar et al., 2018).

Furthermore, previous research has consistently revealed that spirituality at work has positive outcomes. Studies have indicated that spirituality promotes organizational commitment (Hisam & Sanyal, 2021; Giacalone & Jurkiewicz, 2010). Similarly, previous studies have demonstrated that spirituality significantly influences employee engagement (Almotawa & Shaari, 2020), intention to stay (Milliman, Gatling, & Kim, 2018), and reduced turnover intention (Fitriasari, 2020). Furthermore, Garcia-Zamor (2003) has emphasized the positive influence of spirituality at work on overall organizational performance. However, it is crucial to acknowledge that most previous research has primarily investigated the associations between spirituality with various variables, with less emphasis on its relationship with job performance, particularly within the context of nursing. James et al. (2011) have pointed out that only a small number of studies have studied spirituality as a variable influencing job performance. According to Van Wingerden and Van der Stoep (2017), when nurses perceive their work as meaningful, they become more engaged in their jobs or tasks and more committed to providing high-quality care, indirectly leading to improved job performance.

HRM Practices: Within the dynamic and ever-changing landscape of modern organizations, the effective management of human resources has emerged as a crucial component for achieving long-term success and

maintaining a competitive advantage. Delery and Doty (1996) propose a conceptualization of HRM practices as a carefully constructed and regularly executed system to promote the active contribution of employees to the attainment of business goals. Similarly, Ivancevish (2010) defines HRM practices as a strategic function implemented within organizations to optimize the efficient utilization of human resources in achieving the goals of both employees and the organization. As such, HRM practices include practices like recruitment, career development, employee participation, performance appraisal, occupational safety and health, compensation, and training and development. Moreover, studies like Huselid's (1995) have shown that certain HRM practices can lead to better job performance and make employees more motivated. Furthermore, Sasongko (2018) found that effective HRM practices are very important in healthcare settings because they encourage employees to provide patient-centered care. Therefore, it is evident that effective HRM practices directly impact job performance, serving as a valuable tool for organizations seeking to boost employee output.

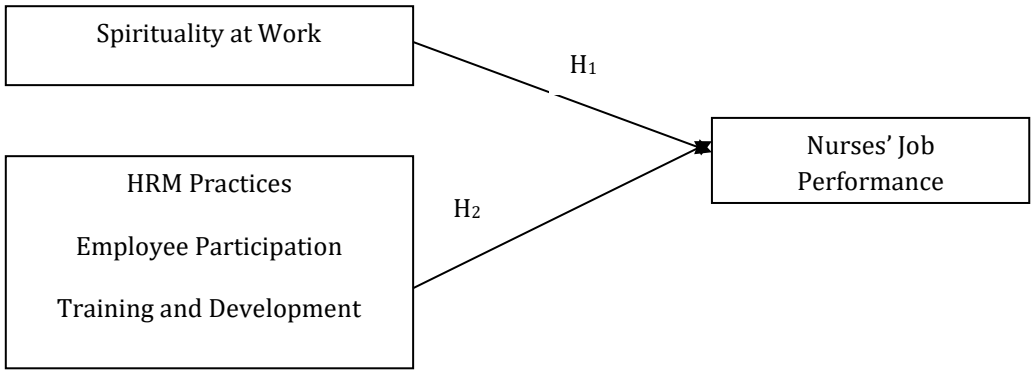
The study by Nasurdin et al. (2020) found that when nurses are involved in decision-making and receive training, their attitudes and behaviors at work will improve. Beh and Loo (2012) suggest that nurses who actively participate in making decisions have less stress and challenges at work. It is because they can voice their concerns and make suggestions for improvements, resulting in better work arrangements (Beh & Loo, 2012) that can increase their engagement and willingness to go above and beyond job description (Lepak, Liao, Chung, & Harden, 2006). Additionally, Ma'arof, Rashid, and Nasuredin (2023) report that training and development programs, along with employee participation, play a significant role in boosting nurse engagement in Malaysia. Simultaneously, El-Gazar and Zoromba (2021) argued that HRM practices such as training and development possess the capacity to enhance nursing performance and make a valuable contribution to the overall excellence of a healthcare organization. This is because in-service training equips nurses and other healthcare providers with exposure to the latest methods, technologies, patient-care standards, and relevant skills (Asiamah et al., 2019), which can increase employee motivation to perform their tasks (Lepak et al., 2006).

Social Exchange Theory: The theory that underpinned the framework in this study is the Social Exchange Theory by Blau (1964) which posits the presence of a reciprocal obligation within the employer-employee relationship. This theory is founded on the idea that social interactions are influenced by behaviors that are dependent on the responses and benefits acquired by each participant. The nature and duration of these encounters and relationships are fundamentally influenced by the reciprocal gratification obtained from this exchange (Cropanzano & Mitchell, 2005). According to Saks (2006), employees determine how often they are involved and perform in their jobs based on resources provided by their respective organizations. Therefore, considering that the Social Exchange Theory is a mutually beneficial relationship between employer and employee, nurses are likely to perceive that healthcare organizations support them in HRM practices through employee participation and training and development practices and offer them opportunities to discover their purpose and find meaning in their roles. So, in return, nurses may respond by exhibiting positive attitudes and behavior, thereby ultimately enhancing their nurse performance.

Research Framework: Drawing on the literature review and underpinning theories, this study proposes a research framework illustrated in Figure 1. The framework examines the potential influence of two independent variables: spirituality at work and HRM practices (employee participation and training and development) on the dependent variable nurses' job performance). It is hypothesized that these independent variables will have significant relationships with the dependent variable. To satisfy the objectives of this study, the following hypothesis may be summarized based on prior discussion and proposed framework:

Objective 1: To examine the relationship between spirituality at work and nurses' job performance.
Hypothesis 1, H_1: There is a significant relationship between spirituality at work and nurses' job performance.
Objective 2: To determine the relationship between HRM practices and nurses' job performance.
H_{2a}: There is a significant relationship between employee participation and nurses' job performance.
H_{2b}: There is a significant relationship between training and development and nurses' job performance.

Figure 1: Research Framework



3. Methodology for Research Direction

This research will employ a quantitative method to gather data from a selected group of respondents. According to Sekaran and Bougie (2010), the quantitative approach is preferable because it allows for hypothesis testing, which may be used to investigate the impact of spirituality at work and HRM practices on nurses' job performance in public hospitals. Additionally, Cavana, Delahaye, and Sekaran (2001) proposed that the quantitative study can be applied to confirm the hypotheses and provide strong reliability and validity.

Research Design: This study will employ two sets of well-structured questionnaires: Set A will be filled out by nurses and Set B will be answered by sisters as tools to gather primary data. The instrument tools will be based on previously published scales in the literature. For example, the job performance instrument will be adapted from the work of Greenslade and Jimmieson (2007). Meanwhile, the spirituality at work instrument will be based on the scale created by Ashmos and Duchon (2000). The instrument developed by Delery and Doty (1996) will be adapted for measuring HRM practices. Respondents in this study will be asked to answer a questionnaire using a 7-point Likert Scale. All items in the questionnaires have been validated. The study proposes possible research that will look at the relationship between Spirituality at Work (IV1) and HRM Practices: Employee Participation (IV2) and Training and Development (IV3) on Job Performance (DV) among nurses in Malaysian Public Hospitals.

Population and Sampling: Respondents for this study will be drawn from nurses and their sisters who are working in public hospitals throughout Malaysia. The reason for selecting public hospitals is that most Malaysians utilize them, which are less expensive and dependent on a taxation system (Ahmad, 2019). The study's unit analysis is a nurse and their sister from all departments. Nurses will be chosen because they are the biggest healthcare workers group (Russeng et al., 2020), and their pivotal role in providing direct patient care. Since the target population is approximately 12,514 nurses across ten general hospitals in Malaysia, a sample size of 375 participants is appropriate based on Sekaran and Bougie's (2010) recommendations and the Krejcie and Morgan (1970) sample size table.

The researcher will employ a purposive sampling technique as a sampling procedure due to the inaccessibility of the sampling frame. Purposive sampling, as defined by Cooper and Schindler (2014), is a non-probability sampling method in which participants are chosen based on their unique features, experiences, attitudes, or views. Although purposive sampling is a method that does not allow generalization, the main purpose is to select a specific target group of respondents who can offer the most relevant information and want to participate, aligning with the study's purpose (Kumar, 2011). Therefore, in this proposed study, nurses and sisters are deemed the most suitable individuals to provide the necessary information. This is mostly due to their firsthand experiences, attitudes, and involvement in the relevant procedures, which enable them to offer valuable data and insights to the researcher.

Data Analysis Tools: This study will utilize the Statistical Package for Social Science (SPSS) version 26.0 for data analysis. Frequency and percentage will be utilized to analyze the respondents' backgrounds. To test the

dependability of each variable in the generation of data, analyses such as demographics, reliability, descriptive statistics, normality tests, correlation, and regression will be conducted. Checking for missing values will also be conducted to ensure the quality of the result is maintained. The demographic information will be analyzed using frequencies and descriptive analysis techniques. The study will employ multiple regression analysis to investigate the link between spirituality at work and HRM practices (employee participation and training and development) on job performance among nurses. Additionally, the study will also employ multiple regression analysis to determine the primary factor that influences nurses' job performance in Malaysian public hospitals.

4. Results and Discussion

The findings of the study will identify factors influencing the nurses' job performance in public hospitals in Malaysia. In other words, the incorporation of spirituality at work and HRM practices, namely employee participation and training and development has the potential influence to improve the overall work environment and support the performance of nurses. Nurses may perform better in the workplace when they possess the ability to openly express their spirituality at work values within the work environment. This integration of spirituality into the nursing profession serves as evidence of the holistic nature of healthcare. Furthermore, when HRM practices such as employee participation and training and development align with the spiritual beliefs and requirements of nurses, the result will show that nurses are not only engaged with their work but satisfied and will constantly deliver a higher standard of care. It is because the way the organization manages its human resources activities establishes a sense of fairness and mutual obligation between the employee and employer relationship, which is in line with Social Exchange Theory (Blau, 1964). According to this theory, nurses tend to display good views toward positive behavior when they receive sufficient support and care from the organization. Therefore, this underscores the need to provide support and nurturing for nurses, so that both healthcare organizations and healthcare professionals such as nurses have equitable advantages in the long run. In other words, integrating spirituality at work and HRM practices has the potential to not only improve the job performance of nurses but also enhance the overall quality of patient care.

5. Conclusion and Recommendations

The nurses' performance has a direct impact on the quality of patient care and is impacted by several factors. Understanding the nurses' job performance is vital for public hospitals in Malaysia since most of the Malaysian population gets medical services from public hospitals. Therefore, healthcare organizations should understand what factors that can motivate their nurses to excel in their profession. Based on previous literature, spirituality at work and HRM practices, namely employee participation and training and development, are influential variables in nurses' job performance, particularly in public hospitals. The decision-makers and authorities of healthcare organizations in Malaysia should integrate spirituality at work values into nurses' daily routines and modify human resource policy to continuously support and facilitate in enhancing the performance of nurses. Nursing management could incorporate spirituality in nursing education by encouraging open dialogues and providing spaces for reflection in a more spiritually nurturing workplace. Feedback mechanism for nurses to share their experience with the integration of spirituality and HRM practices should be established with continuous improvement should be made based on nurse input. Therefore, the proposed framework will provide a better solution for improving the nurses' job performance in Malaysia's public hospitals.

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Policies Improving the Well-Being of Gig Workers in Malaysia

Khaizie Sazimah Ahmad[1], Khairunnisa Abd Samad[1]*, Nur Hayati Abd Rahman[1], Siti Nurazira Mohd Daud[2], Najihah Hanisah Marmaya[3], Yenni Samri Juliati Nasution[4], Raseeda Hamzah[5],
[1]Faculty of Business Management, UiTM Cawangan Melaka, Malaysia
[2] School of Economics, Finance and Banking, Universiti Utara Malaysia
[3]Faculty of Business, Economics and Accountancy, Universiti Malaysia Sabah, Malaysia
[4]Fakultas Ekonomi Dan Bisnis Islam, Universitas Islam Negeri Sumatera Utara Medan, Indonesia
[5]Faculty of Computer and Mathematical Sciences, UiTM Cawangan Melaka, Malaysia
*khairunsamad84@gmail.com

Abstract: Very scarce research has assessed the extent of adverse effects on the well-being of gig workers, particularly in Malaysia. So, the study aims to examine the policies favoring the well-being of gig workers using qualitative methodology of secondary materials examination and semi-structured interviews with policymakers. One of the key findings is that the Malaysian government is very supportive in welcoming the new era of flexibility and freedom of work, such as gig workers. This is particularly relevant to the gig economy, which is characterized by a high degree of uncertainty and variability. The emergent issues significantly call for government and policymakers to design the right policies to enhance gig workers' welfare.

Keywords: *Policy, gig worker, gig economy, working environment, sustainable well-being*.

1. Introduction

In Malaysia, the popularity of the gig economy began during the COVID-19 pandemic. The most common use of digital platforms for gig work in Malaysia includes Uber, Airbnb, Grab and food delivery services such as FoodPanda. According to the Malaysian Digital Economy Corporation (MDEC, 2024) the gig economy in Malaysia is valued at RM 1.61 billion, with local platforms projected to increase from RM 371.4 million in 2021 to RM 650 million by 2025. Currently, there are over 1.12 million individuals engaged in the gig economy, with a yearly growth rate of 23%. Gig workers can earn extra money from their part-time and freelancing jobs; however, they face serious long-term sustainability issues. They can easily earn an instant income that can only last on a short-term basis. Their career growth, income stability and job security are subject to sustainability issues which can affect their long-term well-being. Given that there is no specific protection for gig workers in Malaysia, how can their well-being be guaranteed and not jeopardized if something were to happen in the future? These are just some concerning examples that can lead to sustainability issues. They must be addressed for the benefit and well-being of gig workers in the long run.

Therefore, this paper aims to examine the policies favoring the well-being of gig workers in Malaysia. The gaps policies found in this study are employed to propose better-formulated policies for improving the well-being of gig workers. It was found that very scarce research had assessed the extent how policies improvising the well-being of gig workers, particularly in Malaysia. Therefore, this paper is unique since it significantly aids government and policymakers in designing the right policies for enhancing the general welfare of gig workers.

The remainder of this article is organized as follows: a definition of the gig worker is provided. Subsequently, the methodology employed and findings are discussed in the next section accordingly. Finally, the conclusion of this work is presented.

2. Literature Review

Overview of Gig Workers

The word “gig” is regarded as a tiny, individual task or microtask that is the purpose for which an employee is hired (Aguinis and Lawal, 2013). Duggan et al. (2020) highlighted four elements for classifying gig work, i.e., lack of commitment to long-term relationships, flexible working hours, project-based work and piece-rate payments. In the gig economy, the activity involves temporary, project-based and outcome-based work (Harun et al., 2020). The gig economy is an emerging labor ecosystem that has replaced the traditional full-time work

style tied to office hours with flexible working hours (Caza, 2020). It is fuelled by technical advancements that showcase a person's capacity to satisfy client demands through computers, cell phones, numerous applications and online payments (Sinicki, 2019). According to Schmidt et al. (2023), the gig economy is a type of workplace that includes elements of freelance work, independent contracting, temporary employment and contingent labor. It is widely used with applications that offer on-demand in-person consumer services, including food delivery, errands, home repairs or car-hailing (Kuhn & Galloway, 2019). Several definitions suggest that a gig is a work that must be accessible through a digital platform. Harun et al. (2020) defined gig workers as individuals who either work through digital applications or as independent workers, freelancers or part-time employees with flexible work schedules and workspace. Gig workers are also classified according to the occupation category. They can be freelancers (tutors, tuition teachers, photographers, videographers, and tourist guides), have a technology-based occupation (such as web designers and software developers), drivers (Grab, MyCar, etc.) or riders (Grabfood, Foodpanda, etc).

Digital platforms have greatly benefited the gig economy by providing various advantages for workers, businesses and customers (Gramano, 2019). Duggan et al. (2020) classified gig work into two categories: *appwork* and c*rowdwork* platforms. These platforms allow workers to connect with customers and sell their services by performing tasks. In *Appwork,* clients pay for services in their area and the application mediates the task between the customer and the gig worker. Examples of this gig work include food delivery, parcel delivery and transport services, such as p-hailing and e-hailing. *Crowdwork*, on the other hand, is a digital platform that enables work to be distributed to people in multiple geographical areas. Digital platforms, such as Amazon Mechanical Turk and Fiverr, help people find work to complete remotely (De Stefano, 2018). Those searching for easy and extra income will enjoy crowd work since it entails conducting activities that only require a minimum amount of ability. With appwork, a consumer requests a service, such as food or grocery delivery, and the platform's algorithm then pairs them with a suitable worker who can fulfill their needs (Schmidt et al., 2023).

Work transacted via platforms, which provide local services and require workers to be physically present, is one type of gig in the gig economy. Another type is jobs transacted through platforms but delivered remotely (Huws et al., 2017). Wood et al. (2019) stated there are two distinct types of gig labor: work that is performed in the immediate vicinity (local gig) and work that is performed remotely (remote gig). The term "local gig work" encompasses a wide variety of occupations, such as food delivery, couriering, transport and physical labor. On the other hand, remote gig work entails the remote provision of a wide variety of digital services which can range anywhere from data entry to software programming. These services are through online platforms such as Amazon Mechanical Turk (MTurk), Fiverr, Freelancer.com and Upwork.

3. Methodology

Merriam and Tisdell (2016) reconfirmed that using the qualitative design is a practical method for ensuring a better understanding of certain occurrences from the aspect of relevant parties who are personally experiencing such events. Its architecture has made it possible to organize and direct the data collection and analysis processes. The processes involved establishing a research topic, creating a conceptual framework for the study, gathering and analyzing data, interpreting data and utilizing the systemic diagnostic framework to help explain the results. We used the interpretative approach to perform this investigation, interpreting the data in light of diagnosing the current environment of gig workers' well-being based on secondary materials available online such as websites, journals, newspapers and chapters in books semi-structured interviews with policymakers up to saturated response following the research procedure recommended by the Merriam and Tisdell (2016) and Creswell (2007)

4. Findings and Discussion

This study aims to analyze the current phenomenon of the sustainable well-being of gig workers through the policies formulated in Malaysia. The analysis is represented in Table 1. Corresponding to the respondents' feedback, the gig economy's policymakers include the Economic Planning Unit (EPU) and the Ministry of Finance (MOF). Both entities are responsible for the preparation of development plans or initiatives for the gig

economy. Several initiatives have been introduced since the growth of the gig economy, which is recognized by the government.

Initiatives Taken by the Malaysian Government to Support Gig Workers

In recent years, the Malaysian government has taken some steps to support gig workers. MDEC helped new domestic platforms obtain demand (work) and supply (workers) by connecting each platform to a list of registered workers and promoting the platforms on this list (Olsen, 2019). Malaysia Digital Economy Development (MDEC) was granted RM 25 million to create the Global Online Workforce (GLOW) program. GLOW promises to equip Malaysians with instructions on how to earn money through online platform tasks. In addition, Malaysia encourages the gig economy by introducing e-rezeki, a digital platform that can stimulate gig economy participants. People will receive digital employment based on their talents in e-rezeki. It can also indirectly help those who have lost their jobs to continue living (Rahim et al., 2021).

The government then introduced i-Saraan through the Workers Provident Fund (EPF). The government allocated RM 50 million to this program, which assisted registered gig workers. Notwithstanding the fact that i-saraan is a voluntary contribution, gig workers who enrolled in the program can enjoy the same benefits as full-time KSWP members. It also sought to encourage gig workers to save and accumulate funds. The government further introduced the SOCSO Generator Programme in addition to i-Saraan. This program provides gig workers with assistance through the National Economic Redevelopment Plan (PENJANA). The program's objective is to safeguard the social security of self-employed and gig economy participants. Under Plan 2, the government contributed RM 232.80 to the Self-Employed Social Security System (SKSPS), and the coverage duration is one year. SKSPS SOCSO also provides benefits such as medical benefits, permanent disability benefits and corpse management benefits, among others (Rahim et al., 2021).

The Economic Planning Unit in their Malaysia Digital Economy Blueprint had presented two vital initiatives to gig workers. The "GigUp" program was designed to provide gig workers with a wide range of skills. The aim of this initiative is to guarantee that gig workers with varying educational backgrounds benefit from the necessary skills to improve their employability and mitigate job insecurity. This initiative promotes entities that hire gig workers, such as technology companies, start-ups, and larger corporations, to allocate resources for educating gig workers. The training is subsidized on established online platforms through HRDF, such as Coursera, Udemy, edX, and Codeacademy. The government implemented extended social protection for gig workers to enhance existing benefits provided by PENJANA, safeguarding full-time gig workers or those meeting a minimal hourly threshold across different platforms. A feasibility study was conducted to create suitable social protection programs and outline the implementation strategy for gig workers. Employers are given indirect incentives for their gig workers when they contribute to SOCSO and EPF as stated in the Malaysia Digital Economy Blueprint.

Table 1: Roles of ministries and government agencies

Government Agencies	Citation	Roles
Ministry of Finance (MOF)	• (Employee Provident Fund, 2020) • (Economic Planning Unit, 2021)	• Accountable for overseeing the fiscal management of budget allocated to the ministries and agencies including for the gig economy sector.
Economic Planning Unit (EPU)	• (Economic Planning Unit, 2021) • Ministry of Economy (2023)	• Designing activities for gig workers.
Employee Provident Fund (EPF)	• (Employee Provident Fund, 2020) • (Economic Planning Unit, 2021) • (Aziz, 2023) • (NST Business, 2023)	• Creates a voluntary contribution scheme with incentives known as i-Saraan for self-employed workers. • Increasing the tax relief for their contributions up to RM4,000.
Social Security (SOCSO)	• (Jemon et al., 2021) • (Economic Planning Unit, 2021) • (The Star, 2022)	• Expanding the coverage of social protection to include new categories of informal

	• (Berita Harian, 2022) • (Harian Metro, 2022)	workers under scheme Self-employed Social Security Scheme (SKSPS). • Through this scheme, the government will provide 80% coverage for these gig workers and the other 20% will be covered by the gig workers.
Department of Occupational Safety & Health (DOSH)	• (Ministry of Transportation, 2022) • (TERAJU, 2022) • (Rahman et al., 2021)	• Strengthen awareness and sensitivity of Occupational Health and Safety practices in e-hailing services. • Promotes prevention and health measures through the "Vision Zero" campaign, which is the development of modules or additional promotion guides for work safety and health for drivers and e-hailing operators as well as gig economy players.
Human Resources Development Fund (HRDF)	• (Human Resources Development Fund, 2019) • (Economic Planning Unit, 2021)	• Provides training programs that are related to digital technology.
Jabatan Tenaga Kerja (JTK)	• (Ching et al., 2022)	• Enforce labor laws and international agreements related to labor laws. • Draft and review amendments to labor laws, regulations and orders enforced from time to time.
• Malaysian Institute of Road Safety Research (MIROS) • Jabatan Keselamatan Jalan Raya (JKJR)	• (TERAJU, 2022) • (Rahman et al., 2021) • (Ministry of Transportation, 2021)	• Carrying out research on road safety • Increase public knowledge and awareness of road safety, especially among p-hailing gig workers. • Plan, conduct training and evaluate road safety programs for p-hailing gig workers.
Jabatan Pengangkutan Jalan (JPJ)	• (TERAJU, 2022) • (Rahman et al., 2021) • (Ministry of Transportation, 2021)	• Plan, coordinate and monitor the activities implemented to improve the effectiveness of law enforcement. • Manage activities related to blacklisting, suspension or cancellation of p-hailing's driver's license. • Plan, implement, monitor and evaluate new enforcement programs or policies.
Agensi Pengangkutan Awam Darat (APAD)	• (Agensi Pengangkutan Awam Darat, 2021)	• Monitor and regulate operator performance standards through licensing of buses, goods vehicles, taxis and intermediary businesses (e-hailing). • Hold regular engagement sessions with ministries, government agencies, statutory bodies, operators, associations and industry players. • Analyse and coordinate all activities of collecting, updating, storing and reporting bus data, goods vehicles, taxis and intermediary businesses (e-hailing).
Jabatan Pengajian Tinggi (JPT)	• (Kassim et al., 2020) • (Ghazali & Muhammad, 2021)	• Conduct research related to the gig economy. • Educate students about entrepreneurship in the gig economy.

Malaysian Digital Economy Corporation (MDEC)	• (Rahim et al., 2021) • (Olsen, 2019)	• Develop and implement various digital initiatives and programs related to: • Digital Skills (mydigitalmaker, Premier Digital Tech Institutions, e-Usahawan, GLOW) • Digital Business (Malaysia Digital Hubs, GAIN, DFTZ) • Digital Investments (MSC, Global Business Services, Global Testbed Initiative)

Several challenges facing Malaysian gig workers have been identified, including external issues experienced by gig workers. The first issue faced by the gig industry is the lack of job security and benefits for gig workers (Abd Samad et al., 2023). Gig workers typically do not receive the same benefits as full-time employees, such as health insurance, retirement plans or paid time off. The lack of benefits can make it difficult for gig workers to maintain financial stability, which may further affect their overall well-being. Another potential weakness is the lack of regulatory oversight and accountability for gig platforms. Gig platforms operate as intermediaries between gig workers and customers, but they may not always have the best interests of their workers in mind. This can lead to issues such as low wages, unfair labor practices and lack of transparency in the gig work process. One suggestion to address these weaknesses is to implement regulations that provide more protection and benefits for gig workers. This could include measures such as setting minimum wage standards, requiring gig platforms to provide benefits to their workers and establishing dispute resolution mechanisms to handle grievances between workers and platforms. Additionally, increasing transparency in the gig work process can help ensure that gig workers are treated fairly and that their rights are protected.

The second issue is health and safety concerns. For instance, gig workers may not have access to proper rest breaks since they need to work long hours without adequate rest to meet and maintain ratings for high payment. They also do not have access to appropriate protective equipment or safety protocols. Gig workers may be at risk of physical harm or injury while conducting their tasks, such as drivers involved in road accidents or delivery workers handling hazardous materials (Bergström, 2018). Many gig workers, such as ride-hailing drivers or delivery drivers, spend a significant amount of time on the road. This puts them at increased risk of accidents, particularly if they are driving long hours or in unfamiliar areas. Studies have found that gig economy drivers have higher rates of motor vehicle accidents compared to traditional employees (Burgard, 2019).

The third issue is halal certificate issuance. It is impossible for gig workers to only choose halal-certified food delivery since the Muslim outlet that provides halal services may need to obtain certification from JAKIM or other relevant authorities to ensure compliance with halal standards and regulations. These regulations are generally complicated and time-consuming according to respondents. This may incur additional costs and administrative burdens for gig workers, which can impact their earning potential and ability to participate in the gig economy (Razak & Sulaiman, 2020; Yusof et al., 2019).

The future well-being of e-hailing gig workers is still at stake. A proactive approach must be taken to ensure that they are equipped with the skills and knowledge needed to succeed in the gig economy. The gig economy is still a relatively new and rapidly evolving industry, and many external factors can affect the demand for gig work and the overall financial stability of gig workers. However, with proper financial planning, skill development and a proactive approach to work, gig workers can achieve financial freedom and sustainability in the long run. This can be achieved by diversifying their income streams, investing in their skills and knowledge, keeping track of their finances and prioritizing self-care.

The above-mentioned issues all require careful consideration. Hence, the study outcomes revealed that although the gig economy in Malaysia is supported by government incentives, there is room for improvement. Such improvement is captured in the environment dimension. Hence, Figure 4 offers the sustainable well-being of the gig worker system.

5. Conclusion and Recommendations

The study aims to examine the policies favoring the well-being of gig workers. The conducted study applied the qualitative design since data was obtained through secondary materials and interviews with qualified officials involved in policymaking. The findings indicate there are several policies, initiatives, and incentives in favoring the well-being of gig workers in Malaysia. However, there are some recommendations in the future.

The first proposal is to develop a clear and consistent regulatory framework, one that governs the rights and responsibilities of gig workers, employers and other stakeholders. This can include guidelines for fair wages, working conditions and social protections, as well as mechanisms for monitoring and enforcing compliance. The second proposal is to create a legislative framework that identifies the status and rights of gig economy workers as well as a social safety net that ensures that gig workers have access to health insurance and retirement savings. A platform should also be created for gig workers to connect, share resources and support each other as they work in this new economy. This platform can provide workers with access to health insurance, legal expertise, job postings and educational events. By offering a package of services and helping gig workers with their issues, the platform can become an invaluable resource. The third proposal is to establish a centralized gig worker database to better understand the needs and challenges of gig workers. A centralized database can track gig worker demographics, employment patterns and earnings, which can be useful. This can enable policymakers to develop more targeted policies and interventions.

The fourth proposal is to provide training and support for gig workers. Many gig workers lack the skills and knowledge needed to effectively navigate the gig economy. To address this, policymakers can consider providing training and support programs that help gig workers develop new skills, expand their networks and access resources such as healthcare and financial services. The fifth proposal is facilitating access to halal certification to ensure that gig workers can effectively tap into the growing market for halal products and services. Policymakers can provide access to halal certification programs and resources. This may include providing information and support to gig workers seeking certification, as well as streamlining the certification process and reducing costs. The sixth proposal is fostering alliances between gig workers and traditional industries by promoting greater collaboration and innovation with the help of policymakers. This can involve creating incentives for industries to work with gig workers, as well as developing platforms and resources that enable gig workers to connect with potential partners and collaborators.

These proposals are intended to be a starting point for future policy formulation and can be further developed and refined through ongoing research and stakeholder engagement. Ultimately, the aim is to create a gig economy that is sustainable, equitable and responsive to the needs of all stakeholders.

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The Impact of Blockchain in Financial Industry: A Concept Paper

Alya Ayuniey Mohd Fairoh, Nurul Najihah Hussin, Nur Aina Arisha Jamali, Mazurina Mohd Ali*
Faculty of Accountancy, Universiti Teknologi MARA, Cawangan Selangor, Kampus Puncak Alam, Malysia
*mazurina@uitm.edu.my

Abstract: Blockchain is a cutting-edge technology that is gaining fast recognition as a transformative drive with the possibility to reform many sectors. This concept paper seeks to understand the influence of blockchain on the financial industry, shedding light on its key features, benefits, and challenges. Specifically, this paper explores whether blockchain technology promotes cost-saving in the financial industry. Additionally, this paper discusses the implications of blockchain, particularly regarding its security. It emphasizes the need for collaboration between industry stakeholders, regulators, and technologists to harness the blockchain's full potential while addressing the associated challenges. As blockchain continues to evolve and mature, its effect on the financial industry is expected to increase, reforming the way financial transactions are conducted and recorded in the digital age. This study contributes a holistic approach to expanding the transformative potential of blockchain in the financial sector.

Keywords: *Blockchain; collaboration; decentralization; security; technology; transaction*

1. Introduction

Blockchain used in the financial industry has a significant influence on users and financial institutions, including banks (Mishra & Kaushik, 2023). Users can perform transactions using contemporary systems of electronic payments that act as trusted central third parties and process payments that are secured. Blockchain has made trading incredibly convenient because users, including traders, can now effortlessly deposit funds from one bank account to another without the hassle of converting physical money to gold for transfer purposes (Ullah et al., 2022). This convenience is due to the complex process of transferring funds. Problems could arise from converting money into gold when transferring funds from the payer's bank to the payee's bank. Transferring funds between bank accounts becomes complex as the number of banks involved in fund transfers grows. In response, banks are driven to find methods to enhance the efficiency of the system. One such explanation has been the rise of digital currencies, such as Bitcoin, which utilize blockchain technology to combine decentralized payment systems with new forms of currency (Shaikh et al., 2024). Blockchain has played a vital role in assisting the financial industry in ensuring transparency, democracy, decentralization, effectiveness, and safety by offering a secure, verifiable, and stable method for recording and transmitting data (Marques & Pereira, 2023). When the financial industry is unable to provide transparent service, economic growth slows since fraudulent practices are widespread (Mishra & Kaushik, 2023).

The decentralized nature of blockchain, a key attribute, enhances the security of everyday transactions by maintaining an unchangeable record of all users (Dewang et al., 2023). Consequently, system users' sensitive information remains confidential and protected from unauthorized access. The primary goal of this study is to gain insight into the effects of blockchain on the financial industry. Specifically, the aims include (i) ascertaining whether blockchain is a cost-effective technology in the financial industry; (ii) exploring the potential benefits of implementing blockchain technology in the financial industry; and (iii) assessing the safety of utilizing blockchain technology in the financial industry. This study deliberated to enhance understanding of the effects of blockchain technology in the financial industry, investigating its ability to shape the future of the sector. Blockchain technology can improve the financial industry, specifically banking, by making it easier to track data shared between businesses. This innovation not only presents opportunities for significant cost savings but also has the capacity to reduce the susceptibility to security attacks. Security is one of the abundant benefits of adopting blockchain technology in the banking industry because it secures the transaction ledger via encryption (Javaid et al., 2022). The security is guaranteed by the system's incapability to alter transactions after they are recorded since a unique code is required to access the data. Thus, embracing blockchain in the financial industry can give substantial developments to security, efficiency, productivity and transparency.

Problem Statement: Implementing blockchain in the financial sector presents hurdles, particularly concerning security, as blockchain systems are susceptible to vulnerabilities. The risk of attacks from undisclosed self-

interested individuals poses a threat to the reliability of blockchain. Various incidents have underscored that blockchain's safety is not perfect (Chang et al., 2020). Chang et al. (2020) note that the concerns were unfortunately demonstrated by the infamous Mt. Gox case, where the world's foremost Bitcoin exchange fell victim to theft. He further noted that, on February 28th, 2014, Mt. Gox announced a staggering loss of 850,000 bitcoins from both user and company accounts, resulting in a devastating financial hit of 467 million US dollars.

Additionally, blockchain faces issues related to privacy leakage. Blockchain technology could make artificial addresses that stand in for real user profiles. This method seeks to protect users' identities by lowering exposure and strengthening security (Yang et al., 2023). Unfortunately, blockchain could not prevent the transactional data leak, since all information concerning business and transactions is freely available to everyone (Kosba et al., 2016). Barcelo (2014) demonstrated that transactions made through Bitcoin can uncover personal information about the user. This raises worries about privacy as it could compromise the security of user data. Mischievous actors may obtain users' account passwords or other personal information, allowing them unauthorized access to accounts. This can lead to financial losses if funds from bank accounts or other assets are compromised without the user's knowledge. The concern is continuously unsolved regardless of various efforts to enhance blockchain implementation (Tyagi et al., 2023).

Many studies have focused on how integrating blockchain technology can influence the financial sector, specifically the banking industry. These studies aim to elucidate the complex functioning of blockchain and investigate its various applications in the banking business model. The present operating system in the banking sector is causing concern because of its recurring nature, huge time requirements, and cost. Major banks and central banks are progressively exploring blockchain technology as a practical solution for their current issues in the shift of the financial environment (Khadka, 2020). The pressing question remains: is the integration of blockchain technology truly necessary in the financial industry? This study aims to address the existing gap by exploring the possible effects of integrating blockchain technology in diverse financial institutions, especially banks.

2. Literature Review

Blockchain: Blockchain is a system for managing data that records transactions between multiple parties (peers) securely and transparently. Contrasting with traditional databases, blockchain is not centralized, meaning that there is no single entity ruling or validating the data. Via its sophisticated technology, participants can approve and validate transactions with no reliance on a middle authority like a bank. These potential initiates infinite potential activities, such as trades and fund transfers. The procedure begins with a transaction request, which is then shared with a network of computer nodes, making blockchain an effective and uniform approach to conducting transactions. In a peer-to-peer network, nodes use reliable algorithms to validate transactions and verify user identities. Validated transactions can contain digital currency, records, or varied data. Upon validation, these transactions are merged with others to form new data blocks. These blocks are securely attached to the blockchain, making them irreversible and unalterable. This concludes the transaction process effectively.

Blockchain in its early application was established for Bitcoin cryptocurrency (Nakamoto, 2009). Blockchain was introduced as a virtual currency system that could alter middle authorities to issue money units and confirm transactions. Blockchain permits individuals to make transactions and traders to buy or sell shares from the comfort and convenience of their home or office at a time that suits them best. According to Lim (2021), 56 digital currency firms had registered with Bank Negara Malaysia in 2021.

Blockchain and the Financial Industry: Blockchain is different from the traditional method in the financial industry. One benefit is the unlimited customer service time frame in blockchain technology. Participants can make transactions at any time. In the traditional bank method, there is a limit in the customer service time frame. Participants can only do the transaction or withdraw their money during office hours when accountants are working in the bank. However, digital models like blockchain have an immediate speed of customer service due to the advanced technology. The traditional method needs the act of a middleman, such as a bank, to authorize the transaction. Therefore, there are many steps to complete the transaction because users or participants need to go to the bank to get approval. Next, the scope of service by using blockchain is unlimited because the technology can be accessed anywhere. If a traditional method is used, there is a limit on the branch

network and the workforce. Therefore, a lot of time, money, and energy are required to complete a simple transaction compared to using blockchain technology.

In the Islamic finance industry nowadays, there are many applications for blockchain technology, such as blockchain used in smart contracts, zakat collection and distribution, smart sukuk, and waqf utility (Ardana et al., 2023; Kamaruddin et al., 2023). Every Islamic financial institution must prioritize adherence to Sharia law regarding any novel technology or mechanism, such as blockchain or its various applications (Muryanto, 2023). While the implementation of smart contracts is beneficial for financial institutions, it is imperative to evaluate thoroughly the contract process and correct sequence and establish a mechanism for setting and approving conditions and executing them (Moro-Visconti & Cesaretti, 2023; Sowmya et al., 2024). This evaluation is crucial in safeguarding the legality of financial transactions within Islamic financial institutions (Harahap et al., 2023; Qudah et al., 2023). However, Sharia compliance faces challenges due to the absence of Shariah standards, the shortage of qualified experts, inconsistent rulings and interpretations of fatwas, and the absence of central Shariah supervision (Alaeddin et al., 2021).

3. Discussion

Blockchain is a Cost Saving Technology in the Financial Industry: Contrasting to the conventional method, the use of blockchain technology brings about a significant decrease in costs and value transfers, revolutionizing the way financial processes are managed in comparison to conventional methods (Dong et al., 2023; Naher & Uddin, 2023). For example, conventional banks, as a centralized authority, invest a large amount of funds to prevent technical problems, which demonstrates that conventional methods are more vulnerable and more prone to failures. Integrating blockchain technology in the financial sector could enhance a decentralized system, distinguishing it from conventional approaches. Practically, with the use of blockchain automation and a decentralized ledger, the transactions are more transparent, and the handling is more cost-effective. Therefore, the need for extreme expenditure can be reduced (Moro-Visconti & Cesaretti, 2023). The blockchain model not only lowers the costs but also improves security measures for preventing and detecting fraud (Rane et al., 2023).

In conventional payment method which is characterized as a centralized structure, involves several intermediaries, currency conversions and fees. This leads to transaction lags and substantial costs. For example, the fee charges form a modest portion of any transactions. Therefore, utilizing blockchain technology can minimize intermediary costs by reducing transaction and operational expenses throughout payments and settlements. In other words, blockchain technology eliminates third parties with costly broker fees (Khadka, 2020). Additionally, due to the decentralized system, blockchain also eliminates the requirement for a central authority or intermediary. Therefore, blockchain does not rely on intermediaries to verify and complete the transactions. This is giving advantage and remarkably helpful for cross-border transactions, which frequently require the involvement, communication, and coordination among intermediaries. Through the blockchain system, the procedure is expedited and more cost-effective by eliminating the need for third-party communication and coordination, as a result reducing costs and saving time.

Without blockchain technology, financial institutions, particularly banks, rely on the SWIFT system (Society for Worldwide Interbank Financial Telecommunications) to handle and oversee international money transfers. Through the SWIFT system, banks can efficiently and securely transfer financial information using encrypted messages (Mishra & Kaushik, 2023). It is broadly regarded as the standard for international payment transactions for its extraordinary safety and reliability. However, using services such as the SWIFT system may lead to transaction lags that may vary between 1 to 5 working days. Therefore, blockchain technology may cut the associated charges with international transactions by using innovative solutions that eliminate the need for a third party. This ability directs to automatic payment records and accounting transactions, resulting in decreased operating expenses (Khadka, 2020; Sachitra & Dayaratna, 2023).

The Implication of Blockchain Technology in the Financial Industry: The introduction of blockchain technology has brought forth significant improvements to the financial sector of Malaysia. The major impact of incorporating blockchain technology into the Malaysian banking industry is perceived in the active application and use of this technology by commercial banks. By employing blockchain's security, transparency, and

immutability, financial institutions can eliminate the need for intermediaries and streamline their centralized banking system (Gupta et al., 2023). The decentralization feature of blockchain transforms the way transactions are conducted within the industry. Using blockchain technology, each transaction within the network must be authorized by its users. This feature draws more interest to blockchain technology among financial institutions and investment banks. Furthermore, blockchain has accelerated the process of transferring funds from one account to another. This feature also forces reformation in the traditional banking industry as a result of market competitive advantage and consumer demand. As technology advances, the ability of blockchain to change the financial industry becomes apparent (Satish et al., 2023). Blockchain has the potential to transform the current financial landscape by introducing novel instruments and techniques that emphasize internet connectivity and speed. The need to keep massive volumes of data in financial institutions necessitates the development of creative and advanced technologies for securely storing and transmitting information. As a result, blockchain might provide a reliable and secure platform for data storage and transfer. Blockchain has the ability to eventually replace traditional financial systems to successfully develop asset transfers and enhance global financial infrastructures (Cocco et al., 2017).

Furthermore, blockchain technology functions as a valuable tool for managing risks. Blockchain technology can aid financial institutions in effectively detecting suspected fraudulent transactions. This can be accomplished by consistently observing and monitoring users' behaviors (Zidan et al., 2023). The implementation of anti-money laundering (AML) regulations plays an important role in combating a wide range of illegal activities, including financial fraud and corruption. These regulations are essential for ensuring the integrity of financial systems and prohibiting the flow of illegal funds. Businesses utilize Know Your Customer (KYC) practices to establish long-term relationships with their customers while also reducing risks. Blockchain technology's integration into Industry 4.0 is crucial for developing AML and KYC processes in financial institutions (Dhanabalan & Sathish, 2018). Blockchain technology is an effective tool for verifying and tracking money transfers since it accurately tracks financial transactions using permanent timestamps. This is because each blockchain transaction is entered into a shared ledger that contains all participants' transaction history and credit information. All data on the blockchain is visible and available to each node in the network. This permits all nodes to have a full record of transactions, confirming secure and efficient data sharing. Consequently, there is less demand for onerous and expensive audits. This is because each blockchain transaction is entered into a shared ledger that contains all participants' transaction history and credit information. All data on the blockchain is visible and available to each node in the network. This permits all nodes to have a full record of transactions, confirming secure and efficient data sharing. Consequently, there is less demand for onerous and expensive audits.

Blockchain in the Financial Industry: Is it Safe: Blockchain decentralized, immutable ledger is a feature that has the potential to revolutionize how records are kept. Blockchain technology applies to practically every industry, especially banking. It has the potential to lower operational costs and change the banking system's backend significantly. Blockchain would be necessary to address current challenges faced by banks today. Its advantages include (i) its efficiency to streamline processes through blockchain automation; (ii) its capability to reduce transaction costs by eliminating intermediaries and automating tasks; (iii) it's immutable and verifiable records which can enhance accountability, transparency and trust; and (iv) its decentralization feature which can reduce reliance on third parties, encouraging independence and data security. However, there are issues to be considered regarding blockchain technology, such as whether it is safe to be implemented in the financial industry.

Regulation is a pressing concern in the world of blockchain. As a decentralized system, the question of how best to govern it has sparked intense debate among regulators. While achieving a fully decentralized system may be near impossible, some level of oversight is necessary, especially for financial institutions (Mishra & Kaushik, 2023). Although governments have put effort into establishing rules and regulations for blockchain, its legal status remains unclear. The concern is who will assume responsibility during crises. Since blockchain is a decentralized system, the effect can yet be more severe because no appointed leader to direct through struggling times. Besides, the lack of legislation may leave the dispute resolution between the two financial entities unsure, delaying immediate settlement (Trivedi, 2023).

Even though blockchain technology has been acknowledged as the safest technology of our time, blockchain

still raises issues around data security and privacy. On one hand, the concern is notably true for public blockchains where all parties have access to the data, raising the risk of data misuse and fraud. On the other hand, private blockchains offer a more secure and private alternative to address these concerns (Gupta et al., 2023). Given the seriousness of the issue, financial institutions have raised solemn questions about the security and privacy of blockchain technology. Thus, it is essential for complete and detailed testing to be conducted before adopting blockchain technology (Mishra & Kausjik, 2023). According to a technological evaluation conducted by the Massachusetts Institute of Technology (MIT), about USD$2 billion in cryptocurrencies have been stolen since 2017. Security concerns are growing as a result of the frequent attacks on popular exchanges. A hacker needs to acquire the majority of mining power to gain control of a network, a concept commonly referred to as the 51 percent assault (Mollajafari & Bechkoum, 2023). Further investigation of this topic is crucial due to the potential consequences it may present, as indicated by Orcutt (2019)

Multi-factor authentication is necessary to safeguard blockchain systems from malicious attacks by performing several security checks. The use of multi-factor authentication verifies the legitimacy of users by implementing several verification methods. Furthermore, the integration of multiple authentication phases strengthens security and lowers the possibility of unauthorized system access. It protects sensitive user information against malicious breaches. Multi-factor authentication enhances security by allowing only authorized individuals to perform transactions. If unauthorized access takes place, the system records important data, including IP addresses, locations, and timestamps. This information helps in the investigation and any legal action brought against the offender.

On the other hand, specialized blockchains with tightly regulated governance, known as permissioned blockchains, only grant network access to authorized individuals who have received preapproval and meet specific criteria (Liu et al., 2019; Yawalkar et al., 2023). This closed network maintains the confidentiality of information to prevent it from falling into unauthorized hands. Restricting data access reduces the possibility of data breaches, hence improving secrecy and privacy through permissioned blockchain usage. Permissioned blockchains are crucial in fostering transparency, competency, and efficiency as blockchain technology becomes widely accepted, specifically in the financial sector.

4. Conclusion

Blockchain technology has brought about a significant transformation in the banking sector by revolutionizing the user experience. It has made financial transactions more accessible, efficient, and simple. With the help of innovative electronic payment systems, users can now conduct smooth transactions, which has simplified trading. While blockchain has enormous potential, it also has its challenges, such as potential system weaknesses leading to security breaches and concerns about sensitive data protection. Further research is needed to explore the cost-saving benefits of blockchain technology compared to traditional finance. The most significant advantage of using blockchain technology is that users can verify transactions without the need for clearance from a central authority, such as a bank. This approach is significantly different from conventional methods used in the financial industry. Blockchain technology eliminates the need for time-consuming bank trips, allowing clients to complete transactions quickly, inexpensively, and without the hassles of traditional banking operations.

Blockchain technology offers substantial cost savings compared to traditional banking systems and enables continuous value transfer. Unlike banks that heavily invest in maintaining and building centralized databases, blockchain operates on a decentralized network, which eliminates these costs. The costs associated with centralizing terminal maintenance can also be significant. Conversely, the decentralized ledger and automation of blockchain technology can lead to a reduction in costs while maintaining accountability. Blockchain technology can significantly reduce costs when it comes to managing financial transactions. However, implementing it in the financial sector requires careful consideration. While it offers excellent security, there are still challenges to overcome. Financial institutions must still be monitored by regulatory organizations, making complete decentralization both intriguing and challenging. Although blockchain is considered highly secure, concerns about data privacy and safeguarding personal information must be addressed

Apart from the regulators, industry stakeholders and engineers play a crucial role in maximizing the potential

of blockchain technology and addressing its problems. Collaborative efforts between industry stakeholders and technologists are essential in establishing industry standards and best practices for blockchain technology, which can help enhance security and reliability in various blockchain systems. Standardization of blockchain technology can significantly benefit the industry and pave the way for its widespread adoption.

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Uncovering the Significance of Transformational Leadership in Islamic-Based Institutions: A Systematic Exploration

Jabran Jasni[1], *Sharfizie Mohd Sharip[1] & Dalila Daud[2]
[1]Faculty of Business Management Universiti Teknologi MARA Cawangan Negeri Sembilan Kampus Rembau, Malaysia
[2]Faculty of Accountancy Universiti Teknologi MARA Cawangan Negeri Sembilan Kampus Seremban, Malaysia
*sharfizie@uitm.edu.my

Abstract: Studies on transformational leadership have shown to be beneficial for employees and organizations, particularly those with an Islamic foundation. Islamic elements present within Islamic institutions seem to have different viewpoints regarding the numerous implications of transformational leadership. To have a clear understanding of the transformational leadership presence in Islamic-based institutions, it is crucial to compile prior literature. Then will ensure the efficiency on effectiveness of transformational leadership in Islamic-based institutions for future reference. Regrettably, there has yet to be enough research that thoroughly reviews the body of knowledge on transformational leadership implications for employees in Islamic-based institutions. Therefore, a thorough literature assessment on the impact of transformational leadership on employees in Islamic-based institutions was conducted in this project. This study used the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) review approach to guarantee that the results were of high quality. Two eminent databases, Scopus and Web of Science, as well as one auxiliary database, Google Scholar, were used to retrieve the articles. Two key topics were found through thematic analysis, including 1) employee performance and effectiveness, and 2) employee ethical behavior. Six sub-themes were then created by combining these two primary themes. This research will add to the body of knowledge currently available in the fields of transformational leadership and practical application in institutions with an Islamic foundation. The following are the study's key contributions: 1) pinpointing the beneficial effects of transformational leadership towards employees in Islamic-based organizations, and 2) formulating recommendations for more research in this area.

Keywords: *Transformational leadership, leadership, Islamic-based institution, systematic literature review.*

1. Introduction

The usefulness of the four transformational leadership dimensions in Islamic-based organizations has been demonstrated in various earlier research. For instance, Noor Azizah et al. (2020) demonstrated the importance of individualized consideration and intellectual stimulation during the pandemic in the context of the head of lecturers at the Islamic Education University in Indonesia, whereby job satisfaction and lecturer performance can be maintained even when severely impacted by the pandemic. This was achievable by understanding the struggles faced by the lecturers and encouraging them to hold their classes using innovative means. This is further reinforced by Fadillah et al. (2020), who asserted that transformative leaders were able to boost teachers' capacity for creativity at an Indonesian Islamic school in Jakarta by giving them the freedom to run their classes during COVID-19. This demonstrates that each dimensional characteristic has unique advantages and approaches in pushing workers to perform their duties. From the preceding discussion, it becomes apparent that a considerable body of research has emphasized the advantages associated with transformational leadership within organizations grounded in Islamic principles.

This highlights a growing imperative to conduct a systematic review of these datasets to furnish future scholars with an organized and comprehensive grasp of prior findings pertaining to the implications of transformational leadership on employees in Islamic-based institutions. One established method for conducting such a review is the systematic literature review (SLR), which is a rigorous scientific approach aimed at mitigating systematic biases through the systematic identification, screening, and synthesis of research inquiries using a defined and systematic methodology (Petticrew & Roberts, 2006). However, it is regrettable that in contrast to various other sectors where systematic reviews have been undertaken concerning the implications of transformational leadership, such as in sports coaching (Turnnidge & Côté, 2018), healthcare (Mistry et al., 2020), education (Li, 2022), public universities (Saad Alessa, 2021), and the service industry (Kim et al., 2022), there exists a

noticeable dearth of studies that have systematically scrutinized the implications of transformational leadership within the context of Islamic-based institutions, particularly within the past five years.

In today's rapidly evolving business landscape, effective leadership plays a crucial role in the success of organizations. Leadership is essentially about guiding a group toward common goals by influencing and motivating them (Kellerman et al., 2007). Leaders are accountable for the outcomes of their teams, and the way they lead greatly impacts organizational achievements (Silva, 2016). Research by Meraku (2017) has shown how leaders and their styles can significantly affect organizational effectiveness. In the context of Islamic-based institutions, Jabran and Sharfizie (2022) highlighted the importance of leadership in ensuring their success. Therefore, strong leadership is essential in these institutions. Transformational leadership is a leadership theory that is particularly relevant for driving organizational transformation. Generally, transformational leadership, as outlined by Burns (1978) and Bass (1985), focuses on developing leaders and followers to elevate morale, motivation, and achieve organizational goals. Leaders inspire by harnessing potential and utilizing four key components: charismatic leadership, inspirational motivation, individual consideration, and intellectual stimulation (Epitropaki & Martin, 2004). Charismatic leaders lead with conviction and vision, while inspirational motivation involves guiding followers past obstacles.

Individual consideration involves empathetic leadership, addressing concerns, and offering solutions. Intellectual stimulation encourages followers to explore solutions independently. Considering the increasing need to systematically review existing literature and recognize its potential benefits, this research endeavor aims to undertake an SLR concerning the implications of transformational leadership towards employees within Islamic-based institutions. The findings obtained through the SLR underscore the prevalence of studies on the implications of transformational leadership within Islamic-based institutions across diverse industries and multiple countries. It is a widely held belief that when leaders within Islamic-based organizations embrace the tenets of transformational leadership throughout their teams, their organizations, and the institution, this is expected to yield a multifaceted array of favorable outcomes for the institution. Therefore, the contributions of this study indirectly respond to the imperative for leaders to adopt a transformational leadership approach, thereby promoting employee effectiveness and ethical conduct. In the context of this research, the term "Islamic-based institution" is defined as any form of organization or establishment characterized by an operational environment rooted in Islamic principles.

2. Methodology

This section encompasses three primary concerns: the review protocol, formulation of research questions and systematic searching strategies.

The Review Protocol–PRISMA: Systematic Reviews and Meta-Analyses (PRISMA). PRISMA offers methodological guidance for researchers conducting the current Systematic Literature Review (SLR). A notable challenge in presenting systematic reviews is publication bias. The PRISMA protocol, developed by Moher et al. (2009), provided a clear and structured method to address this problem. PRISMA acts as an evaluation framework, helping readers to understand the strengths and limitations of a systematic literature review. By following this approach, the review process becomes more transparent and objective, which enhances the trustworthiness of the sources and findings (Moher et al., 2016). In line with PRISMA, the researchers identified four main methodological steps. First, they formulated relevant research questions. They then implemented a systematic search strategy, which included three main stages: identification, screening, and eligibility. This was followed by a quality assessment stage and concluded with data extraction and analysis from the selected articles.

Formulation of Research Questions: The process of finding, selecting, and evaluating suitable sources to address the research inquiry can benefit significantly from the application of a systematic literature review Moher et al. (2009). Such a review serves to fill the existing knowledge gaps by revealing findings related to the impact of transformational leadership within Islamic-based organizations, thereby contributing to the existing body of knowledge in this area. It guides the selection of pertinent articles, facilitates data extraction, and informs the subsequent reporting process (Xiao & Watson, 2019). A comprehensive analysis of the literature is essential in addressing the research question, which seeks to provide an overarching understanding of the

effects of transformational leadership on employees within Islamic-based organizations. The formulation of the research questions is informed by a specific mnemonic approach, known as PICo (Population, Phenomenon of Interest, and Context), as proposed by Lockwood et al. (2015). In alignment with this framework, the keywords for this study include "Transformational leadership" (Population), "employees and Islamic-based institutions" (Phenomena of Interest), and the "global context" (Context). In response to that, the following research question was developed for this study:
RQ: What is the implication of transformational leaders towards employees in Islamic-based organizations?

Systematic Searching Strategies: To ensure the rigor and comprehensiveness of this systematic literature review, an exhaustive search endeavor was undertaken. Consequently, a methodical search approach was employed, encompassing four primary stages: identification, screening, eligibility, and quality assessment. These stages are delineated in Figure 1, a modification of the flowchart presented by Shaffril et al. (2019). Furthermore, to prevent bias throughout the procedure, two researchers are required to do this exhaustive search (Delgado-Rodríguez & Sillero-Arenas, 2018).

Identification: The identification phase was carried out from May 2022 until January 2023. It is crucial to determine the primary keywords of this study based on the research topic and their synonyms before proceeding with the initial process. This identification technique might make use of the keywords synonyms, various terms related to the main keyword in this study, which are *transformational leadership* and *Islamic organization*, as identified through thesaurus and previous research (see Table 1). Incorporating various synonyms for the main keywords was essential to ensure the comprehensive inclusion of relevant publications (Saunders et al., 2018). To mitigate retrieval bias, as cautioned by Durach et al. (2017), a multi-database approach was employed. Three reputable databases, namely Scopus, Web of Science (WoS), and Google Scholar, were systematically searched. Notably, the primary databases for article discovery were Scopus and Web of Science, chosen for their reliability and ability to maintain accurate scientific records. Scopus took precedence due to its extensive indexing, housing a repository of over 70 million records across various academic disciplines. Its advantages include stringent quality control, robust search capabilities, and consistent search results across different locations (Gusenbauer & Haddaway, 2020; Martín-Martín et al., 2018). The use of these well-established databases was expected to yield high-quality papers, given their adherence to rigorous standards. Scopus is recognized as the largest abstract and citation database for peer-reviewed literature, encompassing books, journals, and conference papers.

Similarly, WoS, a prominent Clarivate Analytics database, contains a multitude of citations spanning diverse academic subjects. Additionally, Google Scholar was employed as a supplementary resource to provide an alternative perspective on specific research fields. It boasts access to a vast repository of 389 million documents, with a strong focus on the social sciences and the arts and humanities. Furthermore, it offers a diverse array of publication formats, including proceedings, books, theses, chapters, and unpublished materials (Gusenbauer & Haddaway, 2020; Halevi et al., 2017; Martín-Martín et al., 2018). In Scopus and Web of Science databases, we constructed the search query using field codes, phrase searching, and Boolean operators (OR, AND) as detailed in Table 1. Truncation and wildcards were also employed. Similarly, in the case of the Google Scholar database, we utilized phrase searching and Boolean operators (OR, AND). We integrated relevant keyword combinations such as "transformational leadership," "transformative leader," and "transformational leader" into the search strategy for both databases. Additionally, we employed manual search techniques, including handpicking and snowballing, within Google Scholar. The complete search queries for Scopus, Web of Science, and Google Scholar can be found in Table 1. Through these methods, a total of 216 articles were automatically retrieved: 44 from Scopus, 34 from Web of Science, and 138 from Google Scholar.

Table 1: Keywords Search Strategy

Databases	Keyword Used
Scopus	TITLE-ABS-KEY((“transformational leadership*” OR “ transformative lead*r” OR “transformational lead*r”) AND (“employees” OR “subordinate*” OR “work*r” OR “memb*r” OR “Islamic organization*” OR “Islamic institution” OR “Islamic company” OR “Islamic business” OR “Islamic” OR “Islam”))
Web of Science	TS=((“transformational leadership*” OR “ transformative lead*r” OR “transformational lead*r”) AND (“employees” OR “subordinate*” OR “work*r” OR “memb*r” “Islamic

	organization*" OR "Islamic institution" OR "Islamic company" OR "Islamic business" OR "Islamic" OR "Islam"))
Google Scholar	allintitle: ("transformational leadership" OR "transformative leader" OR "transformational leader")("employee" OR "subordinate" OR "worker" OR "member" OR "Islamic organization" OR "Islamic institution" OR "Islamic company" OR "Islamic business" OR "Islamic" OR "Islam")

Screening: In the second phase, known as the screening process, articles were assessed for inclusion or exclusion. From the initial 216 articles identified, duplicates across databases were first removed. For articles sourced from the Scopus and Web of Sciences databases, an automatic screening was applied using the 'limit to' function available within these platforms. However, the Google Scholar database required a semi-automatic approach for screening, as its 'limit to' function only pertains to the publication year. Selection criteria were predicated on the research question previously formulated (Kitchenham, 2007). Adhering to these criteria ensures the relevance of the included articles to the study (Alsolami & Embi, 2018), and effectively narrows down the pool of potential articles (Okoli, 2015). The specific selection criteria utilized are detailed in Table 2. Utilizing database functions, the researchers were able to apply these criteria, further refining the list of articles, as illustrated in Table 2. Only articles written in English were considered. This language restriction ensures clear comprehension and mitigates potential misunderstandings (Okoli, 2015). Furthermore, to maintain the relevance and reliability of the content, this systematic literature review prioritized articles published between 2018 and 2022. This five-year span is chosen as it provides a substantial pool of articles for the SLR and aligns with the notions of research maturity (Alexander, 2020; Kraus et al., 2020). Only articles encompassing all designated keywords were retained. From the original set, nine articles were discarded as duplicates, and an additional 142 were excluded based on the established criteria. Thus, 65 articles were advanced to the next phase, termed the eligibility procedure.

Figure 1: Flow Diagram Adapted from Shaffril et al. (2019)

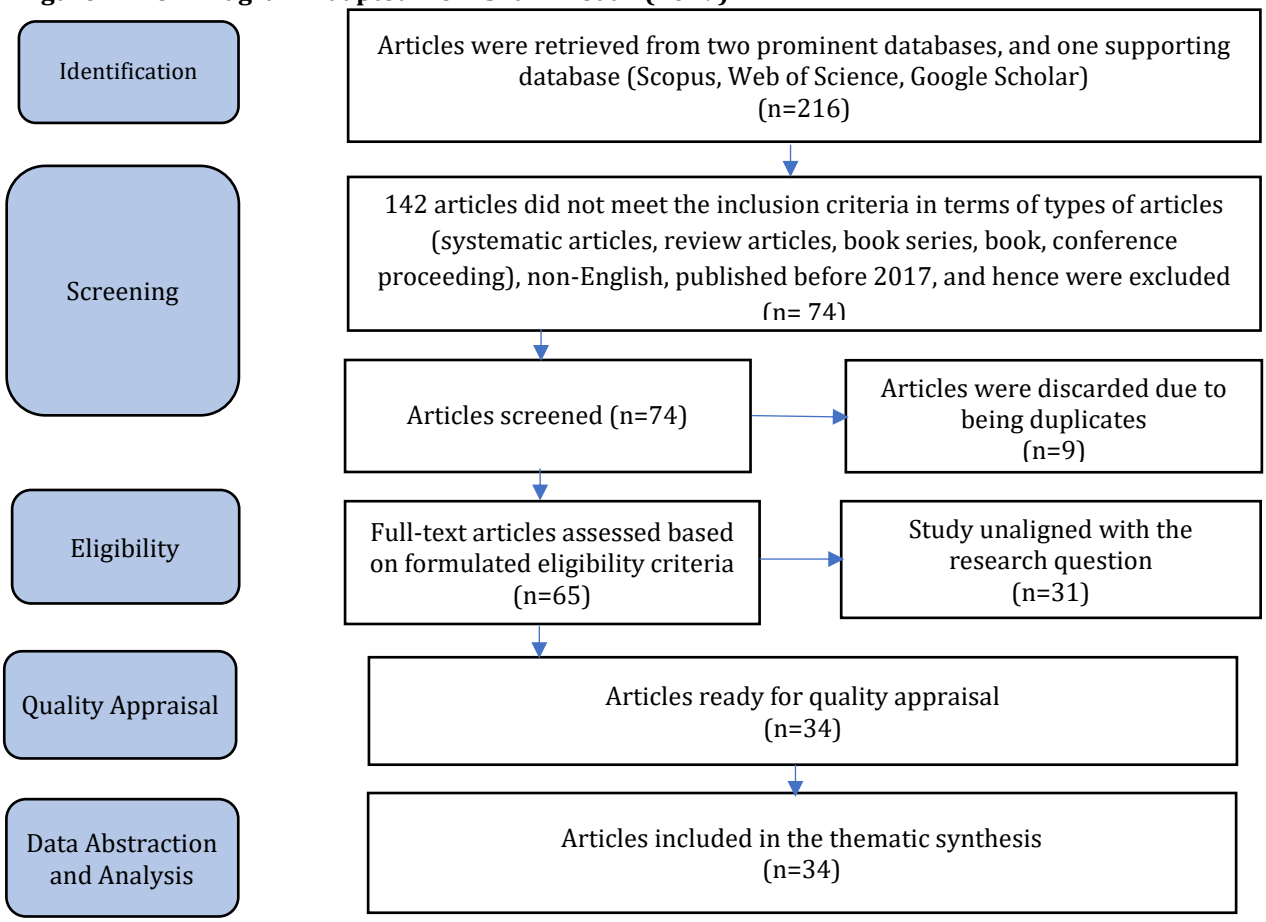


Table 2: The Inclusion and Exclusion Criteria for Screening Process

Criterion	Inclusion	Exclusion
Literature type	Journal (research articles)	Journal (systematic review), book series, book, chapter in book, conference proceeding
Language	English	Non- English
Timeline	Between 2018-2022	<2018

Eligibility: The eligibility stage, as the third procedure, is dedicated to manually assessing the articles post-screening to ascertain their appropriateness. It necessitates a thorough review of the titles and abstracts to gain a comprehensive understanding of the content. Table 3 presents the eligibility criteria derived from the initial research question, aiding in evaluating the suitability of the remaining articles. From the 65 articles subjected to this process, only 34 align directly with the specified criteria. Several were excluded due to their broader emphasis on general leadership factors rather than a specific focus on transformational leadership. Furthermore, certain articles were not pertinent to the specific context of this study, which targets Islamic-based organizations. There were also instances where articles were deemed unfit because they examined leadership implications directed at consumers or external stakeholders rather than organizations and their employees.

Table 3: The Articles' Eligibility Criteria

Criterion	Eligibility
Methodology	Article journals that report on empirical, qualitative data and quantitative data.
Focus	The focus is on transformational leadership styles toward employees within Islamic-based organizations.
Context	The presence of transformational leadership should be in the context of an Islamic-based organization.
Implication	The implication is towards an organization and employees, not towards consumers or other stakeholders.

Only 34 out of the 65 articles considered in this eligibility process are directly relevant to the requirements. Those 34 articles were therefore reviewed in the final step, i.e., the quality assessment.

Quality Appraisal: A total of 34 articles proceeded for further quality analysis. The author and co-author (who are subject-matter experts), examined the abstracts, literature, research methodology, findings, and conclusion of the entire article in depth (Appraisal Quality). This is done to guarantee the quality of the papers and their appropriateness for this systematic literature evaluation. Following that, the articles were divided into three primary categories: good, mediocre, and low (Petticrew & Roberts, 2006). Articles that are rated as good or moderate will move on to the review process. Articles that are rated low will not be reviewed in the interim. A total of 13 articles were classified as good quality, 21 as moderate, and none as bad. This indicates that the review process was initiated for all the remaining articles.

Data Extraction and Analysis: To gain a deeper understanding of the publications that had successfully passed the quality assessment, a comprehensive examination of each article was meticulously undertaken, contributing to the formulation of themes for this systematic literature review. The process initiated with data extraction, wherein the researchers conducted a detailed review of the abstracts, results, and findings within each of the 34 selected articles to extract pertinent information. This data was considered relevant if it satisfied two criteria established by the researchers: firstly, addressing the specified research questions, and secondly, aligning with the study's objectives. During this phase, a qualitative synthesis approach, specifically thematic analysis, was employed to underscore the implications of transformational leadership on employees within Islamic-based institutions. This analytical choice was underpinned by the inclusion of articles encompassing qualitative, quantitative, and mixed-method studies, grounded in the principle of integration (Okoli, 2015; Whittemore & Knafl, 2005). Flemming et al. (2019) supported this approach, asserting that for qualitative syntheses encompassing diverse research designs, thematic analysis stands as a suitable method. The thematic analysis commenced with the identification of themes and sub-themes, considering their commonalities and interrelationships gleaned from the literature.

By combining the abstracted data which share common characteristics, two basic categories emerged: "employee's performance and effectiveness" and "employee's ethical behavior," each comprising its sub-categories. Subsequently, these identified themes underwent a second, comprehensive analysis, involving meticulous examination and coding to refine central themes and ensure the accuracy and consistency of the thematic framework. In line with Braun and Clarke (2006), this analytical technique aimed to identify, assess, and elucidate emergent themes and sub-themes derived from the collected data. Any discrepancies regarding the concept of producing the themes and sub-themes must be corrected during the theme development process. Consequently, a number of sub-categories were omitted for those reasons. Specifically, the sub-categories under "employees' performance and effectiveness" are "organizational citizenship behavior", "job satisfaction", "teamwork" and "innovation capabilities" (see Table 4). Under "employees' ethical behavior" are the sub-categories of "self-integrity and "Islamic work ethic" (see Table 4). To enhance the rigor of the analysis, the developed themes and sub-themes were presented to two specialists in leadership and human resource management. These experts systematically reviewed each theme in light of the 34 articles and arrived at a consensus affirming their appropriateness.

Table 4: The Themes and Sub-Themes

Studies	Region	Sector	Employees Performance and Effectiveness				Employees Ethical Behavior (EEB)	
			OCB	JS	TW	IC	SI	IWE
(Tanjung et al., 2020)	Indonesia	Islamic Education	/	/				
(Mukhlisin et al., 2021)	Indonesia	Islamic Education			/			
(Masrohatin et al., 2019)	Indonesia	Islamic Education	/		/			
(M. Ahmad & Rochimah, 2021)	Indonesia	Islamic Education					/	
(Hendijani Fard et al., 2020)	Iran	Private Banks	/					
(Hambali & Idris, 2020)	Indonesia	Islamic Education				/		
(Noor Azizah et al., 2020)	Indonesia	Islamic Education		/				
(Sabran et al., 2022)	Indonesia	Islamic Banks					/	
(Fadillah et al., 2020)	Indonesia	Islamic Education				/		
(Javed et al., 2020)	Saudi	Information and Technology						/
(Aini et al., 2021)	Indonesia	Islamic Education			/		/	
(Y. Ahmad et al., 2019)	Indonesia	Islamic Education						/
(Subandi et al., 2021)	Indonesia	Islamic Education	/					
(A. B. Ahmad & Cheng, 2018)	Iraq	Public sector	/			/		
(Mukhtar et al., 2019)	Indonesia	Islamic Education		/		/		

(Kolomboy et al., 2021)	Indonesia	Islamic Healthcare		/			/
(Supriadi et al., 2020)	Indonesia	Islamic Education				/	
(Moey & Hashi, 2018)	Malaysia	Healthcare Education		/			
(Rizky Pratama et al., 2020)	Indonesia	Islamic Education	/				
(Rulitawati et al., 2021)	Indonesia	Islamic Education				/	
(Mohammad Al-Khaldi et al., 2020)	Kuwait	Islamic Banks	/				
(Siswaty Ibrahim et al., 2020)	Indonesia	Islamic Education					/
(Rianto et al., 2021)	Indonesia	Islamic Banks	/			/	
(Din et al., 2019)	Pakistan	Islamic Banks	/				
(Ananda Lubis, 2022)	Indonesia	Islamic Education		/			
(Khoiri et al., 2022)	Indonesia	Islamic Education					/
(Falah et al., 2021)	Indonesia	Islamic Education					/
(Hanafi et al., 2020)	Indonesia	Islamic Banks		/			/
(Fitriyah et al., 2019)	Indonesia	Islamic Education					/
(Risqina et al., 2019)	Indonesia	Islamic Education	/				/
(Harmen et al., 2018)	Indonesia	Islamic banks	/				
(Suryadi et al., 2022)	Indonesia	Islamic Education				/	/
(Mastur et al., 2022)	Indonesia	Islamic Education	/	/			
(A. Ahmad & Bayu, 2018)	Indonesia	Islamic Banks		/			

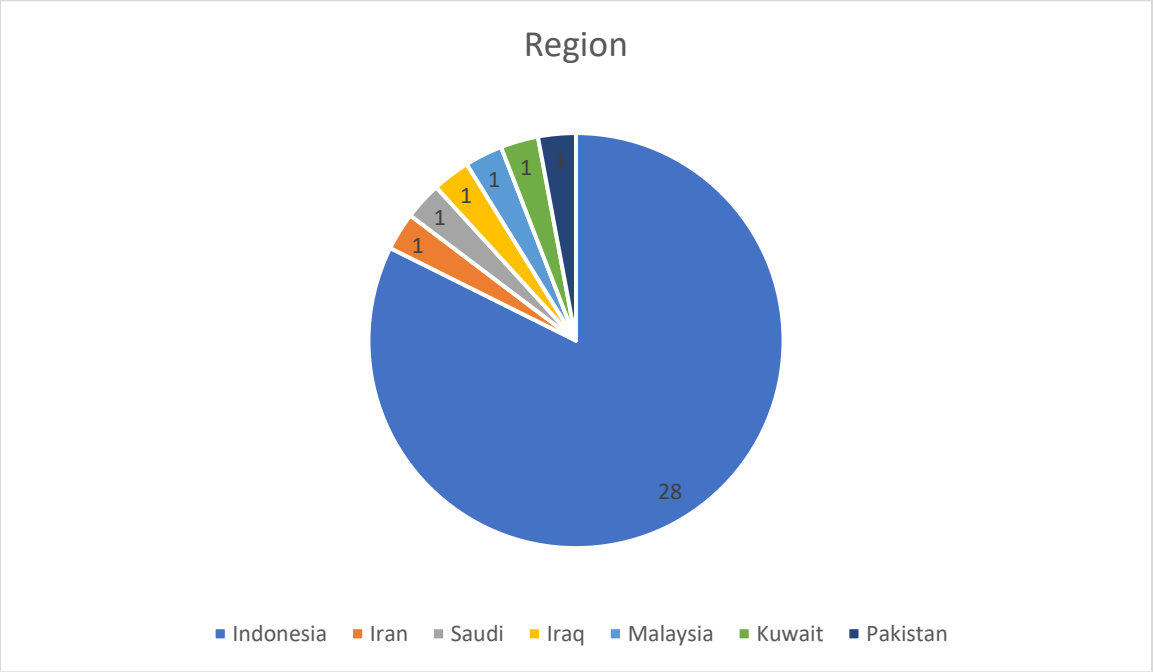
(*OCB: Organisational Citizenship Behavior, JS: Job Satisfaction, TW: Teamwork, EEB: Employees Ethical Behavior, IC: Innovation Capabilities, SI: Self-Integrity, IWE: Islamic Work Ethic.

3. Results

Background of Selected Studies: Upon reviewing 34 articles, two primary themes were discerned related to the implications of transformational leadership towards employees within Islamic-based institutions: employees' performance and effectiveness, and their ethical behavior. This thematic analysis further yielded six sub-themes: organizational citizenship behavior, job satisfaction, teamwork, employees' ethical behavior, innovation capabilities, and self-integrity, all culminating in the Islamic work ethic. A methodological breakdown reveals that out of these 34 articles, 26 adopted a quantitative approach, while the remaining 8 utilized qualitative methods. The research settings spanned seven countries, all located in Asia: Indonesia, Iran, Saudi Arabia, Iraq, Malaysia, Kuwait, and Pakistan. Notably, Indonesia was the focal point for 28 of these studies

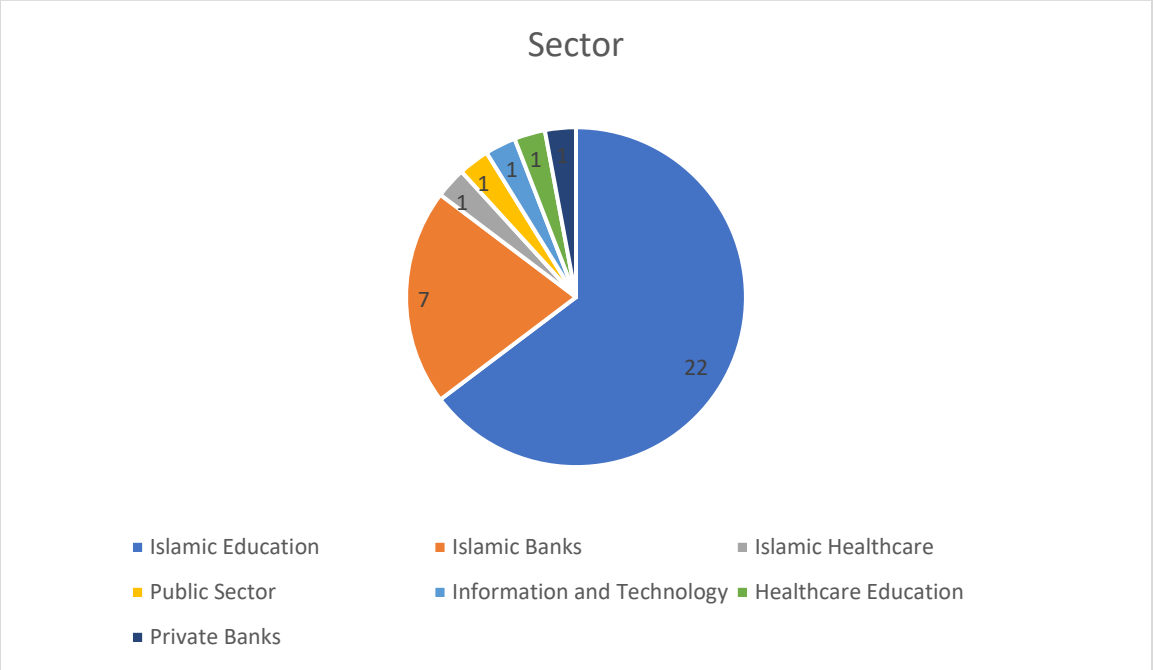
on transformational leadership in Islamic institutions, highlighting a profound understanding of this leadership style within its Islamic institutions. The exclusive representation of Asian countries in this review underscores the absence of relevant studies from other global regions.

Figure 2: Region



Under "Sector", the Islamic education sector was found to be the most dominant including *madrasahs*, *pasentran*, Islamic colleges, Islamic boarding schools and others.

Figure 3: Sector



The fact that there are many teachers worldwide—approximately 85 million—is a major factor in why so many studies have been conducted in the Islamic education sector (The World Bank, 2022). Teachers must guide their students in a transformative way if they want to guarantee creative and innovative learning outcomes (Vermeulen et al., 2022). This is done to serve as an example for the students and to encourage them to be more creative and keep up with the fast-paced setting. The Islamic banking sector is most predominant in Indonesia, Iran, Kuwait and Pakistan. This is because the existence of transformational leadership, with vision and the ability to read trends in market developments, technology, and competition patterns, is necessary to create strategic advantage in the Islamic banking industry (Hermawati & Mas, 2017). It is hence essential for the corporate-level global market to have a transformative leader who is aware of Islamic banking's human resource issues (Sabran et al., 2022). The rest of the studies were conducted in other sectors including the public sector in Iraq, information technology in Saudi Arabia, healthcare education in Malaysia, and Islamic healthcare in Indonesia. There is a need for future studies to concentrate on these types of Islamic-based institutions, including those not already mentioned like waqf, mosque, zakat, Islamic insurance, Islamic foundation, Islamic training center, and many others, due to the lack of studies in these diverse industries.

Themes and Sub-Themes: We identified two recurring themes in the remaining articles: employees' performance and employees' ethical behavior. The issue of how employees' ethical behavior affects performance and effectiveness was also brought up in several of the articles. The following sub-section provides a thorough explanation.

Employees Performance and Effectiveness: It was discovered that transformational leadership has a favorable impact on organizational and personnel effectiveness. There are four sub-themes under "employees' performance and effectiveness" namely: organizational citizenship behavior (OCB), job satisfaction (JS), teamwork (TW), and innovative capabilities (IC). These four sub-themes could improve how well employees perform for their Islamic organizations. First up is organizational citizenship behavior, which is defined as the action of employees who are willing to perform a task beyond the scope of their job description. To improve Islamic-based institutions, OCB is essential. Through it, subordinates can develop their work skills and teamwork abilities. In keeping with the findings of this study, the transformative principle was found to help Madrasah Aliyah achieve success on the national and international levels by fostering organizational citizenship behavior, inspiring motivation, and intellectual stimulation (Subandi et al., 2021). For instance, the principal's outstanding principles and high level of commitment pushed the school community to work together to raise the standard of education at the institution.

The next sub-theme is job satisfaction, which refers to how satisfied people are with their jobs overall, including the environment at work and the demands of their jobs. This study asserts that a transformative leader who can harness the power of people can improve staff performance and job satisfaction (Ananda Lubis, 2022). This is because transformational leaders make every effort to realize their vision and so indirectly boost the productivity and job satisfaction of their subordinates. As an Islamic institution, assisting one another is a culture (Mukhlisin et al., 2021) from the perspective of teamwork. Therefore, transformational leadership can enhance teamwork skills in Islamic organizations and positively affect performance where teamwork culture is strong. In the context of Indonesian Islamic banks, a manager's transformational leadership might affect their subordinates' ability to adapt to the corporate competitive advantage (Rianto et al., 2021). Consequently, the four pillars of transformational leadership are positively correlated with employees' willingness to adopt new ideas and change (A. B. Ahmad & Cheng, 2018; Fadillah et al., 2020).

Employees' Ethical Behavior: It has been discovered that transformational leadership encourages employees to act more morally. "Self-integrity" and "Islamic work ethic" are the two sub-themes under "Employees' Ethical Behaviour". The ethical behavior of employees in their affiliated Islamic organizations will eventually rise because of these two sub-themes. Employees' ethical behavior is described as the conduct governed by ethics displayed by employees at work, such as honesty and ethical manners. Islamic work ethics refer to moral conduct displayed by a person in accordance with the Qur'an and the Hadith. Employees who adopt an Islamic work ethic, for instance, will regard their work as one of their responsibilities and view it as a virtue. Additionally, numerous studies have revealed that higher ethical behavior on the part of employees can boost productivity and effectiveness. This is because followers will hold a leader with strong integrity in high regard, making them a role model (Aini et al., 2021). Additionally, as transformative leaders in

Islamic organizations, leaders who consistently spread Islamic principles and values to all staff members will eventually encourage an Islamic work ethic in the organization (Y. Ahmad et al., 2019).

4. Discussion

Under organizational citizenship behavior, various studies in the context of the Indonesian Islamic education sector have demonstrated that transformational leaders can help improve organizational citizenship behavior, which will ultimately boost the performance of students, teachers, non-educators, and the overall school community. This means that as leaders become more effective at influencing organizational citizenship behavior in their subordinates, the performance of the latter will improve (Tanjung et al., 2020). For instance, a transformational leader in an Islamic religious college in Jember, Indonesia, uses his authority and position to affect the organizational citizenship behavior of non-educator personnel (Masrohatin et al., 2019). Additionally, the Institute for Islam Studies Jember community was found to be positively motivated by the principles of transformational leadership even during the COVID-19 pandemic's difficult days (Risqina et al., 2019). This is because transformational leaders build emotional bonds with their teams as they work towards accomplishing their goals and vision to improve productivity, awareness, and trust (Mastur et al., 2022). In the context of an Islamic school in Bogor, Indonesia, Rizky Pratama et al. (2020)noted that transformational leadership can boost organizational commitment and lower personnel turnover.

Employee turnover rates that are too high can harm an organization's performance. In the Islamic education sector, transformational leadership supported by Islamic organizational culture was also found to increase organizational citizenship behavior among employees (Subandi et al., 2021). Numerous research conducted outside the context of Islamic education have come to the same conclusion, i.e., transformational leadership increases organizational citizenship behavior and improves employee performance. This was demonstrated in the contexts of private banks in Iran, the Iraqi public sector, Islamic banks in Kuwait, Indonesia, and Pakistan. Additionally, it was discovered that transformational leaders greatly increase job satisfaction levels among workers in a variety of industries and regions, including Islamic education, Islamic healthcare, Islamic banks in Indonesia, and healthcare education in Malaysia. This is due to the three crucial emotional, spiritual, and social talents that Islamic transformational leaders in Islamic organizations possess (Kolomboy et al., 2021). Transformational leaders have demonstrated their ability to improve subordinates' job satisfaction and performance in the context of Indonesia's Islamic education sector despite being badly hit by the COVID-19 pandemic (Noor Azizah et al., 2020). This is corroborated by Moey and Hashi (2018) who studied nine nurse educators and found that leaders at Malaysian nursing schools play critical roles in elevating the nurse educators' job satisfaction.

This is because nurse educators who practice transformational leadership always inspire their team members to strive for greater success than the intended outcomes. This suggests that the subordinates are content and satisfied since they are aware that they can develop under the guidance of transformational leaders. Based on a study on Indonesian Islamic banks, the individualized consideration of transformational leadership has been shown to improve employees' job satisfaction and performance (Hanafi et al., 2020). As an illustration, transformational managers in Islamic banking are constantly available to listen, encourage and counsel, as well as pay attention to the requirements and accomplishments of their subordinates. This is consistent with the study of A. Ahmad and Bayu (2018) conducted in an Islamic commercial bank in Indonesia, found that a transformational leader's continual discussion with staff members can help the latter understand what they can contribute to their work and boost job satisfaction. Through organizational citizenship behavior and transformational leadership, employees' job satisfaction can also be increased (Mastur et al., 2022; Tanjung et al., 2020). Three studies found that transformational leadership can affect employees' capacity for teamwork in the Indonesian Islamic education sector. The prevailing Islamic organizational culture in the organization affects organizational teamwork through transformational leadership (Masrohatin et al., 2019).

According to Mukhlisin et al. (2021), in the context of administrators in Indonesian Islamic schools, transformational leadership can improve performance in environments with a strong culture of teamwork. A leader who cultivates a positive bond with his followers could better communicate his motivational objectives, offer support whenever needed, and give attention to his subordinates. The employees' capacity for teamwork can be improved by a leader who serves as an example (Aini et al., 2021). The head of an Islamic

boarding school, for instance, serves as a positive example to her subordinates when she encourages teamwork and participates in all school events. Several studies have demonstrated that transformational leadership fosters creativity among staff, particularly in the Indonesian Islamic education sector, Islamic banking also in Indonesia and the Iraqi public sector. It goes without saying that to survive the COVID-19 outbreak, one must be able to adapt to the situation. In the context of an Indonesian Islamic school, Fadillah et al. (2020) demonstrated that transformational leadership substantially increased teachers' capacity for innovation during the pandemic. For instance, the administration frequently hosted online conferences and webinars to support teachers and enhance parent-teacher engagement while the school was in lockdown (Rulitawati et al., 2021; Suryadi et al., 2022).

This is to ensure that the subordinates have the ability, freedom, and autonomy to be more creative under the transformative leader (Mukhtar et al., 2019; Supriadi et al., 2020). With regards to employees' self-integrity, some Indonesian-based studies on the Islamic education sector and Islamic banking have demonstrated the ability of transformational leadership to increase employees' self-integrity and ultimately their organizational performance. Here, self-integrity refers to the leaders' value of integrity as demonstrated at work. Nasliza Arina & Jamilah, (2018) asserted that leaders who possess Islamic work ethics based on the Al-Quran and Al-Hadith can boost the self-integrity and professionalism of employees. For instance, a leader with high self-integrity can motivate students and teachers to successfully achieve their objectives. In Indonesian Islamic banks, it was discovered that a manager's transformational leadership can effectively lower employees' unproductive work behavior to achieve organizational goals (Sabran et al., 2022). Numerous studies have noted that transformational leadership significantly improves employees' Islamic work ethics in the contexts of the information and technology sector in Saudi Arabia, Islamic education, Islamic healthcare, Islamic banks in Indonesia. Due to the embedded Islamic culture, transformational leadership greatly affects employees' Islamic work ethics in Islamic-based organizations (Javed et al., 2020). Falah et al. (2021) asserted that employees with good Islamic work ethics are highly committed to their organization and demonstrate enhanced work performance.

5. Conclusion

Out of the 34 retrieved papers, transformational leadership positively affects Islamic institutions in Asia. This demonstrates that the four pillars of transformational leadership—idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration—are critical in improving employees' productivity and effectiveness. Transformational leaders are noted to boost job satisfaction, enhance citizenship behavior, improve teamwork, and drive innovation toward improving competitiveness. Transformational leaders rooted in Islamic culture and beliefs are also demonstrated to boost ethical behavior. Islamic-oriented transformational leaders can drive employees' sense of self-integrity and Islamic work ethics via the four transformational leadership dimensions. This is because Islamic leaders would always encourage their followers to act appropriately and do good (Jabran & Sharfizie, 2022). Through role modeling, transformational leadership has a positive impact on employees' ethical behavior.

Table 5: Table of Conclusions

Transformational Leadership Implications Towards Employees Within Islamic-based Institutions	Authors
Boost job satisfaction	(A. Ahmad & Bayu, 2018; Ananda Lubis, 2022; Kolomboy et al., 2021; Mastur et al., 2022; Moey & Hashi, 2018; Mukhtar et al., 2019; Noor Azizah et al., 2020; Tanjung et al., 2020)
Enhance organizational citizenship behavior	(A. B. Ahmad & Cheng, 2018; Din et al., 2019; Harmen et al., 2018; Hendijani Fard et al., 2020; Masrohatin et al., 2019; Mastur et al., 2022; Mohammad Al-Khaldi et al., 2020; Rianto et al., 2021; Risqina et al., 2019; Rizky Pratama et al., 2020; Subandi et al., 2021; Tanjung et al., 2020)
Improve teamwork	(Aini et al., 2021; Masrohatin et al., 2019; Mukhlisin et al., 2021).
Drive innovation towards improving	(A. B. Ahmad & Cheng, 2018; Fadillah et al., 2020; Hambali & Idris,

competitiveness	2020; Mukhtar et al., 2019; Rianto et al., 2021; Rulitawati et al., 2021; Supriadi et al., 2020; Suryadi et al., 2022)
Drive employees' sense of self-integrity	(M. Ahmad & Rochimah, 2021; Aini et al., 2021; Sabran et al., 2022)
Promote Islamic work ethics	(Y. Ahmad et al., 2019; Falah et al., 2021; Fitriyah et al., 2019; Hanafi et al., 2020; Javed et al., 2020; Khoiri et al., 2022; Kolomboy et al., 2021; Risqina et al., 2019; Siswaty Ibrahim et al., 2020; Suryadi et al., 2022)

Following the critical review of the 34 derived articles via qualitative synthesis for both quantitative and qualitative articles, several suggestions for further knowledge and practical contributions were made. Future research in transformational leadership can incorporate other regions or continents where the Islamic effect is prominent, thus adding to the body of knowledge. To acquire a clearer understanding of the impact of transformational leadership on Islamic-based institutions, future studies can also concentrate on the effect of transformational leadership on other Islamic sectors such as waqf, mosques, and other Islamic-related institutions. In terms of practical contribution, based on the significantly positive outcomes found in the selected articles, the leaders in Islamic institutions should implement and practice transformational leadership along with all four dimensions. This is particularly relevant in the seven regions—Indonesia, Iran, Iraq, Malaysia, Pakistan, Kuwait, and Saudi Arabia—as established in the reviewed studies. Methodology-wise, future studies can employ more databases in addition to Scopus, Web of Science, and Google Scholar in identifying relevant publications to gain a more comprehensive perspective of the subject matter. Future research can also look at other types of religious institutions as this current study focused primarily on Islamic-based institutions to gain varied viewpoints on transformational leadership.

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The Trend of Halal Cosmetics Supply Chain Research in a Decade: A Systematic Review and Bibliometric Analysis

Wan Marhaini Wan Omar[1]*, Nurzalikha Aimi Mohd Subri[1] & Mohd Hafiz Zulfakar[2]
[1]Faculty of Business and Management, Universiti Teknologi Mara Cawangan Kelantan Kota Bharu Campus, Kelantan, Malaysia
[2]Faculty of Business and Management, Universiti Teknologi Mara Cawangan Selangor Puncak Alam Campus, Selangor, Malaysia
*whaini299@uitm.edu.my, nurzalikhaaimi@yahoo.com, mohdhafiz@uitm.edu.my

Abstract: The Halal cosmetics sector has risen in recent years, and it has received attention from academics and practitioners. Prior works on halal studies have examined food and beverage, but not the supply chain of halal cosmetics. This study aims to explore the distributions and trends of the halal cosmetics supply chain and to identify the gap in this research domain. The integrated systematic literature review and bibliometric analysis were employed to gain insight and evaluate the literature of this study. Based on the reviewed articles, the number of published halal cosmetics supply chain studies is limited. Data were obtained from the Scopus database, resulting in a limited dataset of 58 articles published between 2012 and 2023. Several tools and software were utilized for data extraction and analysis, including Publish or Perish, Excel Spreadsheet, and VOS Viewer. Co-citations analysis and co-words analysis were used to map the trends of publications and distinguish current research potentials. The findings reported the top authors of this research area, the main sub-research areas, and the most cited articles. In addition, new research directions in the realm of halal cosmetics supply chains were offered. Future academics could investigate new study clusters of the halal cosmetics supply chain empirically.

Keywords: *Halal Cosmetics Supply Chain, Systematic Literature Review, Bibliometric Analysis, Network Analysis, Co-Citation Analysis.*

1. Introduction

The halal sector is expanding in response to the global demand for halal products (Fadzillah, 2022). Although the halal industry is new in the global economy, the industry has proliferated, valuing US$560 billion per year while the overall value is estimated at US$2.3 trillion (Azam & Abdullah, 2020). The demand for halal products is rising globally as the Muslim community expands. The population of Muslims globally is predicted to grow between 1.6 billion in 2010 to 2.7 billion in 2050, implying that the Muslim population will expand by nearly 1.1 billion during the following forty years (Pew Research Center, 2015). The halal industry is divided into product and service sectors (Ahmed, 2023a). The product sectors range from health products and cosmetics to pharmaceuticals, while service sectors are marketing, packaging, supply chain, manufacturing, logistics, financing, and branding. In addition, hospitality management, fashion, travel, and tourism are part of the extended sectors in the halal industry. There are highest demands for halal products in many Muslim-majority nations, and the halal business has grown to substantially contribute to the world economy. It is a complete process beginning with production until the product or service is delivered to the customers.

Halal is not only concerned with meat, poultry and food but it also incorporates lifestyle requirements such as personal care, cosmetics, and health products (Akram, 2020). Hence, the halal cosmetic industry is emerging and has become a primary concern among Muslims globally. The priority concern of Muslim consumers is being alert to the contents and ingredients of the cosmetics. Only products that satisfy their needs and give them "peace of mind" are being used and consumed (Shah et al., 2021). Certification by a recognized halal certification body is often required for a product to be marketed as halal, and several organizations around the world provide such certification. Halal cosmetics are cosmetic products that are formulated, manufactured, and packaged according to compliance with Islamic principles and requirements (Sugibayashi et al., 2019; Shamsuddin & Yusof, 2020). These products are free from ingredients that are considered haram (forbidden) in Islam, such as alcohol, pork, and any other animal-derived ingredients that are not sourced from animals slaughtered according to Islamic rules.

According to Isa et al. (2023), the industry of halal cosmetics is a rapidly growing segment of the global cosmetics industry, driven by the increasing demand from Muslim consumers who want to use products that align with their religious beliefs and values. Halal cosmetics are popular not only amongst Muslim consumers but also among non-Muslims who want natural and organic products. Halal certification for cosmetics involves a rigorous process that ensures the products are permitted from haram ingredients and meet the safety and quality standards set by the halal certification bodies (Latif et al., 2014; Masood, 2022). The certification process involves a thorough review of the ingredients, manufacturing processes, and packaging to ensure that they comply with halal requirements. Some halal-certified cosmetic brands also adhere to other ethical standards, such as being cruelty-free and vegan. These brands are not only catering to the Muslim market but also to the increasing demand for sustainable and ethical products in the global market. The academic literature on halal cosmetics supply chains has been relatively new since its emergence in the last decade. Several halal studies were conducted on pharmaceuticals and cosmetics in the previous literature.

Nonetheless, the research has primarily focused on the adoption of halal transportation and halal warehousing among Malaysian halal manufacturers (Ngah et al., 2019), certification, ingredients, and consumer behavior (Putri et al., 2019). Thus, limited empirical studies have been conducted on the halal cosmetics supply chain. For that reason, an integrated systematic literature review (SLR) and bibliometric analysis have been employed for further analysis. A bibliometric analysis is undertaken to determine the study's structure and identify the different literature patterns. Undertaking a bibliometric analysis will provide data extracted from citations, keywords, authors and a range of journals (Leung et al., 2017, Fauzi, 2022). Thus, the study aims to identify the research gaps by analyzing the bibliometric and systematic approach of halal cosmetics supply chain literature. A co-citation analysis combined with the co-occurrence of the keyword analysis was undertaken to visualize the growth of this study area. The following section starts with the study's introduction, followed by the literature review on halal cosmetics and the bibliometric approach. Then, the methodology section is discussed. Section four highlights the study's findings. The final section concludes the study and offers some suggestions for future research.

Overview of Halal Cosmetics Supply Chain: The halal cosmetics supply chain is the process by which halal cosmetics are produced, transported, and distributed to retailers and consumers. The supply chain begins with the sourcing of raw materials, which must meet halal standards, and concludes with the distribution of finished goods to retailers or consumers. The global demand for halal cosmetics among Muslim customers is increasing significantly (Gateway, 2024). By 2030, the Muslim community will account for 2.2 billion of the world's population. Due to this expansion, the halal products' demand will increase substantially (Mustafar et al., 2018). Muslim consumers are currently demanding high-quality products that must follow Islamic law (Sugibayashi, 2019). Halal cosmetics are in high demand among the large Muslim population and non-Muslim consumers who trust these products. The latter group is drawn to halal products due to their perceived decent consumerism and higher quality assurance standards (Sugibayashi et al., 2019). Non-Muslims prefer halal cosmetics because they believe they are clean and safe to use (Ahmed, 2023b). Asia is the primary market for halal cosmetics in terms of geography, with production anticipated to outpace other regions. The Global Islamic Economy 2021/22 report by Dinar Standard revealed a significant rise in the expenditure of Muslim consumers on beauty items.

In 2018, its worth was estimated at US$64 billion, and it is projected to increase to US$95 billion by 2024. According to Gateway (2020), Southeast Asia is the leading manufacturer of halal cosmetics, accounting for 40% of the market share. The Middle East follows with a 12% market share, while the United States and Europe both maintain a 4% market share. In 2020, Salaam Gateway, the largest website directory of halal cosmetic products, stated that the growing presence of halal cosmetic products in Asia can be attributed to the heightened consciousness among Muslim consumers and the well-established halal Islamic law that includes specific guidelines for cosmetics, particularly in Malaysia and Indonesia. Malaysia is a prominent Asian nation in the halal cosmetics sector, boasting an increasing number of halal-certified cosmetic brands (Swidi et al., 2010). The nation possesses a robust regulatory framework for the certification of halal products, and the government has undertaken steps to foster the growth of the halal industry. In addition, Indonesia holds the distinction of being the most populous nation with a Muslim majority and boasts a substantial market for halal cosmetics. The nation is seeing an increasing quantity of cosmetic companies that have obtained halal certification.

The government has enacted regulations to foster the expansion of the halal sector (Suparno, 2020). In addition, as emphasized by Hanim et al. (2015), Pakistan is a nation where most of the population adheres to the Islamic faith. This has resulted in a burgeoning market for halal cosmetics, with the country boasting several companies that have obtained halal certification. Furthermore, the government has taken measures to encourage the growth and advancement of the halal industry. Several studies have been conducted on the expansion of the halal cosmetics supply chain framework. Zainuddin et al. (2019) investigated the efficacy of the halal supply chain using a mixed-methods approach that comprises a case study and a survey. The objectives of the study were to look at the impact of halal certification and labeling on the efficiency of the halal supply chain. Yusoff et al. (2015) emphasized the significance of understanding the halal supply chain in influencing both Muslim and non-Muslim customers' purchasing preferences for halal products.

Ngah et al. (2019) also investigated the factors that influence cosmetics and pharmaceutical companies' decisions to use halal storage services. While empirical study on the halal cosmetics supply chain has been undertaken, there is a lack of systematic discussion on using bibliometric analysis for the halal cosmetics supply chain model. As a result, the objective of this research is to answer the following questions:

i. What is the knowledge framework of existing halal cosmetics supply chain studies?
ii. Under the current research structure of this area, is identifying insightful suggestions for future development in the halal cosmetics supply chain field possible?

Thus, to serve these purposes, the study's objectives are to complement the previous reviews on the area of the supply chain of halal cosmetics and identify the future trends in this area of study systematically. The research area of the halal cosmetics supply chain remains under-researched, specifically concerning bibliometric analysis on halal cosmetics supply chain-related issues, which analysis is yet to be done. Therefore, the bibliometric analysis in this study area requires immediate consideration.

2. Systematic Literature Review on Halal Cosmetics Supply Chain

A systematic review, according to Armstrong et al. (2011), is a sort of literature review that uses descriptive methodologies to collect secondary data, critically analyze studies, and qualitatively or quantitatively synthesize results. The objective of systematic review is to overcome these challenges by discovering, measuring, and synthesizing the findings of relevant, high-quality studies that address one or more research issues. A systematic literature review (SLR) was used to collect relevant material on the factors influencing natural lighting in the classroom. The SLR methodology was used by the reviewers to develop suggested daylighting design features, particularly for the classroom educational facility. The four stages of the SLR method are depicted in Figure 1.

Figure 1: Stages of SLR Method

Phase 1: Identifications
Phase 2: Data Screening
Phase 3: Eligibility
Phase 4: Data

A thorough analysis of the literature on the area of halal cosmetics supply chain and supply chain agility published in peer-reviewed journals was carried out by searching major bibliographic databases for publications published between 2012 and 2023. The major bibliographic database used in searching the relevant articles is the Scopus database. The data were extracted using a software known as Publish or Perish (POP). The keywords and title words are used to capture a variety of related topics. The research trend for halal cosmetics in the past ten years also shows that most previous studies on halal cosmetics focused on purchase intention, halal cosmetic adoption, knowledge and religiosity, awareness, and halal cosmetics concepts (Mohd Subri et al., 2022). Furthermore, most of the methods used in this study area are conceptual which include surveys, case studies, and SLR. However, limited studies are adopting SLR to analyze data on halal cosmetics supply chains. Past studies were using SLR; however, the studies only focused on halal cosmetics, not the halal

cosmetics supply chain. Mohd Subri et al. (2022) applied the SLR analysis to the area of halal cosmetics by focusing on the research trends and opportunities of halal cosmetics. Meanwhile, Isa et al. (2023) conducted an SLR on the research related to consumer adoption of halal cosmetics. Therefore, the SLR analysis in this research area is necessary.

Bibliometric Analysis in Halal Cosmetics Supply Chain: According to Pritchard (1969), the pioneer of bibliometric analysis, the word bibliometric is "the application of mathematical and statistical methods to books and other means of communication." This analysis allows literature in their field to be examined and helps researchers identify the major themes (Leung et al., 2017). Donthu et al. (2021) stressed that bibliometric analysis is also used by scholars to reveal the latest and developing trends in journal and article performance, research constituents, and collaboration patterns as this analysis explores the structure of specific domains in the literature. Therefore, combining bibliometric analysis with scientific mapping techniques enables researchers to visualize the academic research structured field (Cobo et al., 2011). According to Han et al. (2020), different bibliometric analysis approaches are influenced by the types of information used in the analysis, resulting in varying outcomes. Co-word analysis keywords co-occurrence analysis, and co-authorship analyses are the most often used approaches for citation-based analysis (Van Eck & Waltman, 2014). Van Eck and Waltman (2014) described three citation-based analytic methods: citation analysis, co-citations analysis, and bibliographic coupling.

Co-citations and co-word analysis were used to analyze the data in this study. According to Ding et al. (2014), the most used bibliometric method is co-citation analysis. Co-citation occurs when two publications are quoted in the same article (Ahmi et al., 2020). These two publications are thought to be related because they are frequently cited in other articles (Benckendorff & Zehrer, 2013). Co-words, on the other hand, relate to the occurrence of two or more items at the same time (Ahmi et al., 2020), while VOSviewer creates a visual representation of keyword co-citation and co-occurrence. According to Mohd Subri et al. (2022), halal cosmetics have become an emergent industry globally. The halal cosmetic industry is a highly competitive industry with numerous domestic and international players. Nevertheless, academic studies on halal cosmetics, especially on the supply chain, are limited and still in the early stage of publication (Azmi et al., 2021). Various studies have been undertaken on halal cosmetics areas, including research by Abd Rahman et al. (2015), Sugibayashi et al. (2019), Zulkifli and Abd Rahman, (2019), and Ngah et al. (2021). However, currently the study on the halal cosmetics supply chain is still unavailable.

The research trend for halal cosmetics in the past ten years also shows that most previous studies on halal cosmetics had focused on purchase intention, halal cosmetic adoption, knowledge and religiosity, awareness, and halal cosmetics concepts (Mohd Subri et al., 2022). Furthermore, the most common method used in this study area is conceptual which includes survey, case study, literature review, and systematic literature review. There are limited studies that adopt bibliometric analysis to analyze the data. According to the authors' research, the area of study on halal cosmetics supply chain that uses bibliometric and network analysis techniques is non-existent. In halal cosmetics, only one study employed bibliometric analysis. Azmi et al. (2021) conducted a bibliometric examination of halal cosmetics literature that spanned two decades. The year of publication, affiliations and author names, keywords, the language utilized, and geographical distribution of the publications were used to evaluate the data analysis. This research spans the years from 2000 to 2020. Despite the availability of empirical studies on bibliometric analysis of halal cosmetics, the use of bibliometric analysis for the halal cosmetic supply chain model has not been thoroughly studied. As a result, the bibliometric analysis in this research area is required.

3. Materials and Methods

The next section outlines the specific materials and research approach employed in the present study. To conduct the review, an interpretive systematic literature review (SLR) and bibliometric analysis are utilized.

Phase 1 – Systematic Literature Review (SLR): The review protocol, publication standard of publication, or recognized guidelines are applied in the systematic review. In social science research, the analysis methodology is analogous to a research design. It is critical to choose which review to read. At the start of the investigation, a protocol, publication standard, or recognized guideline is used (Okoli & Schabram, 2012). The established

guideline by Donthu et al. (2021) is adapted for this study. This established standard is created exclusively for the sector of education. However, the guideline is adaptable to different sectors and has been utilized in a variety of them. Formulating the research issues is the first step of this study, followed by a systematic searching method, screening the inclusion and exclusion criteria, assessing the eligibility, data extraction, data analysis, and reporting.

Formulating the Research Problems: The PICo refers to population, intervention, control, and outcomes. The difficulties of research or research questions for this investigation are developed using the works of Lockwood et al. (2015) and Mohamed Shaffril et al. (2020). PICo is used as a guideline in developing the questions of the study. PICo involves three fundamental concepts: population or issue, interest, and context. This research's population can be characterized as panel survey data that encompasses a wide range of topics, including trends and distributions, limitations, and methodologies. Therefore, the research questions are developed based on this concept: "What is the knowledge framework of existing halal cosmetics supply chain studies?" and "Under the current research structure of this area, is identifying insightful suggestions for future development in the halal cosmetics supply chain field possible?".

Systematic Search Strategies: The publications are found in one of the most important bibliographic databases which is Scopus. It has been studied for over 11 years from 2012 to 2023. Scopus is used as the database for the literature search. The database was chosen because it is one of the comprehensive peer-reviewed abstracts and database of citations in a variety of relevant fields, including environmental studies, multidisciplinary social sciences, social issues, developments and planning, and others. Furthermore, Scopus offers the largest repository of business search results, which are commonly employed in systematic literature reviews (Durach et al., 2015). To monitor and screen the articles from the databases, the Publish or Perish (POP) tool is employed. The keywords for the search procedure are identified using earlier literature.

Table 1: The Search String Used to Retrieve Records

Database	Search String
Scopus	TITLE-ABS-KEY (("halal cosmetics" OR "halal" OR "cosmetics") AND ("halal cosmetics supply chain"))

Screening the Inclusion and Exclusion: The articles are improved during the screening process based on four criteria in the bibliographic database: (i) timeline, (ii) language, (iii) document type, and (iv) subject area.

Table 2: Inclusion and Exclusion Criteria

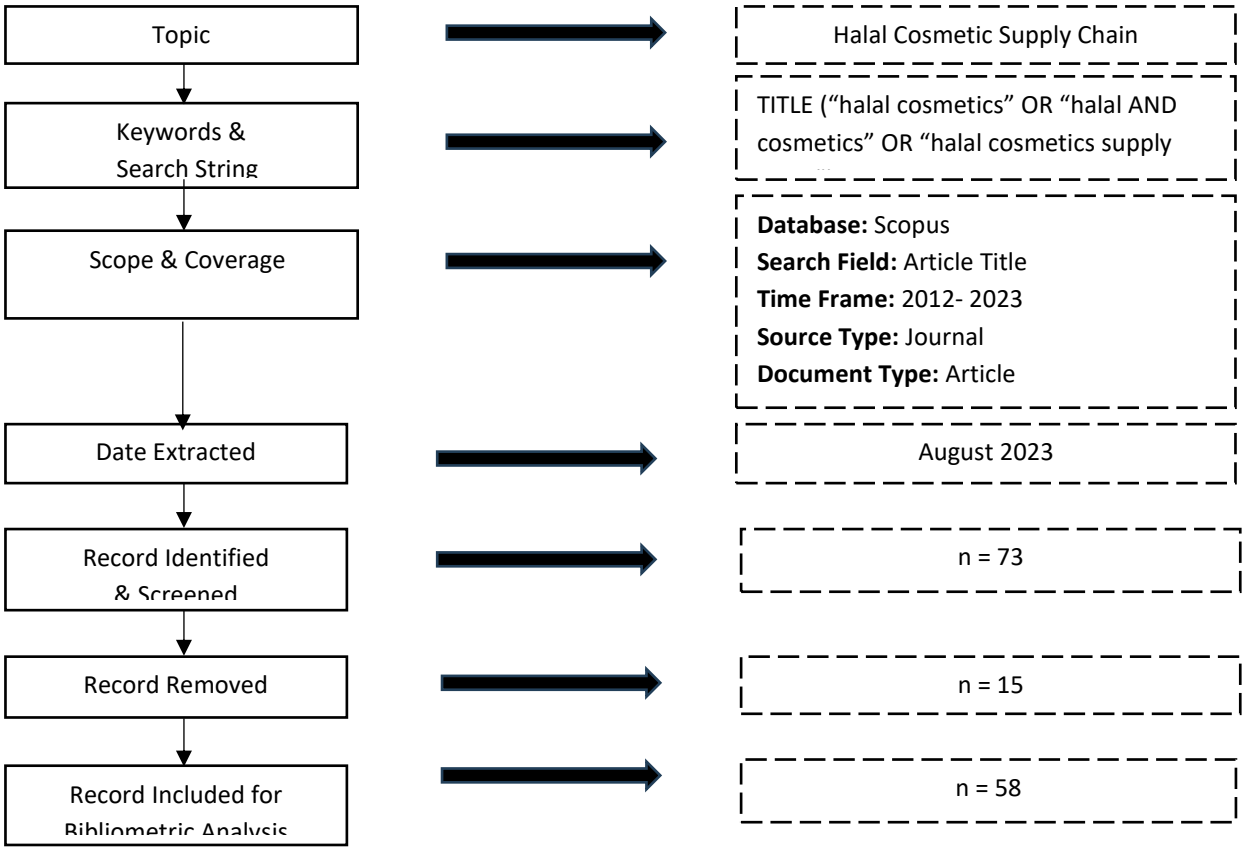
Criterion	Inclusion	Exclusion
Timeline	2012-2023	Other databases
Language	English	Non – English
Document Type	Journal article	Book series, book chapter in the book, conferences proceeding, editorial, non-research paper, review papers, opinion pieces.
Subject area	Social sciences, business, and management	Other subject areas in bibliographic databases of Scopus.

Eligibility: The search term in Table 1 is generated using the list of acknowledged keywords. The review questions are analyzed by searching for precise keyword groups on titles and abstracts. A total of 73 items are obtained through the search approach. Nevertheless, 15 records are removed from the dataset. Consequently, a total of 58 papers are selected for further scrutiny.

Data Extraction: Scopus, the most comprehensive database for global abstract and citation, is used to acquire the bibliographical data for this study. Keywords "halal cosmetic" AND "halal cosmetics supply chain" are searched in the database using TITLE-ABS-KEY ("halal cosmetic" OR "halal AND cosmetic" OR "halal cosmetics supply chain"). In terms of publishing time, the period under consideration ranges from 2012 to 2023. In the preliminary search, 73 publications are found relevant to halal, and all the articles' titles and abstracts are thoroughly assessed. Following that, three materials are removed from the search: books, reviews, and notes. As a result, 58 publications are retained for additional examination in this study. Each source of information

yields abstract, author affiliation, institution name, publication year, source name, and the number of citations. The descriptive analysis is evaluated using the Scopus Analyser. Following data cleansing, the data are exported to an Excel spreadsheet and Published or Perish (POP). The VOSviewer is used for co-citations analysis and keyword co-occurrences analysis. FIGURE 2 depicts the method used to specify the study topic, identify keywords to search for, set the scope and coverage based on specified criteria, and determine the total number of documents to be evaluated in the study.

Figure 2: Systematic Protocol of Retrieving the Datasets



Data Analysis: The tools used for the identification of the most productive journal, current publication trend, contributing institutions, contributing countries, and authors are Scopus Analyser, Publish or Perish (POP) and Excel spreadsheet. These tools utilize information such as the number of published information sources and the most cited articles. To verify the ranking of the journal and H-index, the SCImago Journal website and Country rank are consulted. Afterward, the bibliometric network is constructed and visualized by exporting the CSV files to VOSviewer software. The VOSviewer software is a tool utilized for the construction and visualization of networks involving documents, sources, authors, companies, or even countries. Networks can be constructed using several types of analysis, such as co-authorships, citations, or co-citation interactions.

Phase 2 – Bibliometric Analysis: In 1969, a scholar known as Pritchard introduced the bibliometrics method. Bibliometrics is a discipline within information and library sciences that employs quantitative methods to analyze bibliographic data. Additional factors to consider are the publication year, country of origin, and authors (Pritchard, 1969). Bibliometric analysis is a method that uses data of quantitative from previous publications to assess publishing patterns in various academic fields. Additionally, it allows the researcher to assess the corpus of literature in their specific area of research and pinpoint the primary subjects of interest (Feng et al., 2017; Vogel & Güttel, 2013). Researchers can utilize bibliometric analysis to examine trends, reader behavior, citation patterns, knowledge repositories, author networks, and the importance of a subject (Liang & Liu, 2018). The present study examines two widely used forms of citation-based analysis, namely bibliometric

analysis of co-word analysis, sometimes referred to as keywords co-occurrences analysis, and co-citations analysis.

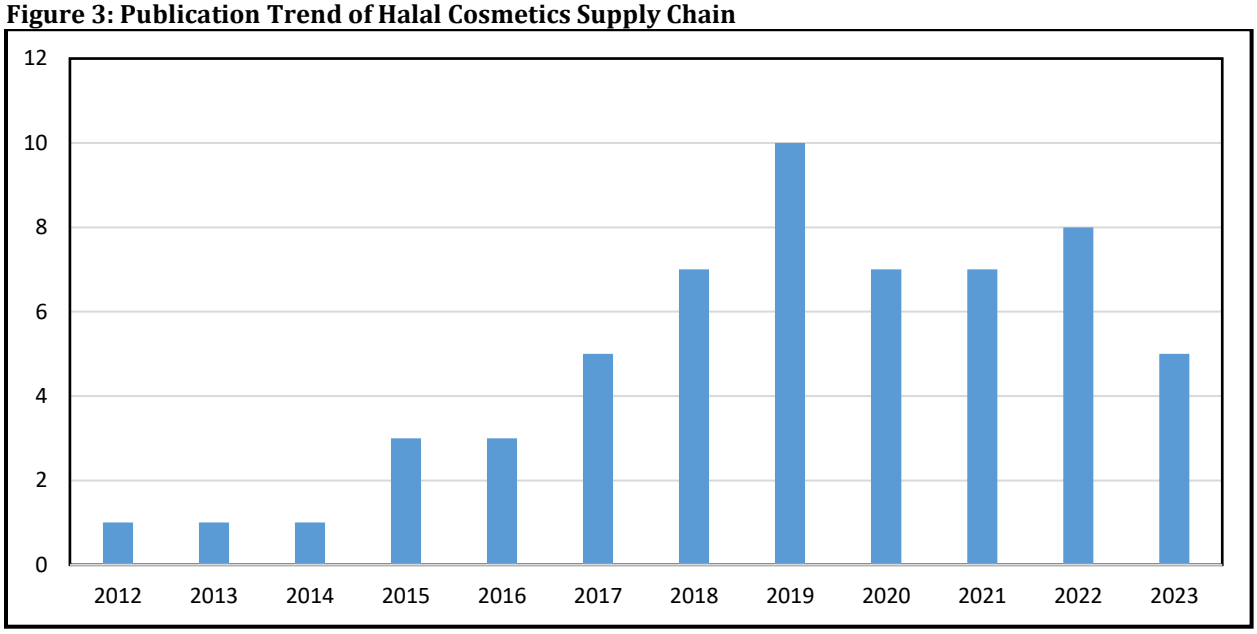
4. Results and Discussion

Publication Trend: Table 3 and Figure 3 show the publication trend of halal cosmetic supply chain topics per year. The graph displays an upward trend reflecting an increasing interest among the researchers in the area. The publication on halal cosmetic research began to grow from 2012 to 2019, and the trend slightly dropped in 2020 and 2021. However, starting from the year 2022, the number of publications showed an upward trend as the halal cosmetics supply chain became more popular. More than five papers were published from 2017 to 2022. Hopefully by the year 2023, publications for this area will grow and become more popular among the academia.

Table 3: The Publication Trend of Halal Cosmetic Supply Chain

Year	Total Documents	Percentage (%)
2012	1	2%
2013	1	2%
2014	1	2%
2015	3	5%
2016	3	5%
2017	5	8%
2018	7	12%
2019	10	17%
2020	7	12%
2021	7	12%
2022	8	14%
2023	5	9%
Total	58	100.00%

Figure 3: Publication Trend of Halal Cosmetics Supply Chain



Most Cited Articles: The Scopus Analyser website generated a total of 15 articles. These 15 articles, as shown in Table 4, are the most frequently mentioned on halal cosmetics. The analysis yielded the title, the initial author, the year of publication, the journal name, the total number of citations, and the number of citations. The most important publication, published in the Journal of Islamic Marketing, was mentioned 524 times by several

authors in halal cosmetic studies. Ab Rahman (2015) wrote the most cited paper, "Consumers and Halal Cosmetic Products: Knowledge, Religiosity, Attitude, and Intention."

Table 4: Top 15 Most Cited Halal Cosmetic Supply Chain Articles for the Period of 2012-2023

Title	First author	Year	Journal	C/Y	TC
Consumers and halal cosmetic products: Knowledge, religiosity, attitude, and intention	Abd Rahman, E. Asrarhaghighi, S. Ab Rahman	2015	Journal of Islamic Marketing	65.5	524
Assessing knowledge and religiosity on consumer behavior towards halal food and cosmetic products	Rahman et al.	2015	International Journal of Social Science and Humanity	32.75	262
Exploring antecedents and consequences of Indonesian Muslim youths' attitude towards halal cosmetic products: A case study in Jakarta	Briliana, N. Mursito	2017	Asia Pacific Management Review	32.67	196
The Effect of Halal Label, Halal Awareness, Product Price, and Brand Image on the Purchasing Decision on Cosmetic Products (Case Study on Consumers of Sari Ayu Martha Tilaar in Binjai City)	H Aspan, IM Sipayung, AP Muharrami	2017	International Journal of Global Sustainability	24.83	149
Factors influencing attitude towards halal cosmetic among young adult Urban Muslim women: A focus group analysis	Hashim and Musa	2014	Pertanika Journals of Science and Technology	15.56	140
A review of cosmetic and personal care products: Halal perspective and detection of ingredient	P Hashim, D Mat Hashim	2013	Pertanika Journals of Science and Technology	12.00	120
An Overview of Online Purchase Intention of Halal Cosmetic Products: A Perspective From Malaysia	RNN Naseri	2021	Turkish Journal of Computer and Mathematics Education	51.50	103
Halal certification organizations in the United Kingdom: An exploration of halal cosmetic certification	Annabi, O.O. Ibidapo-Obe	2017	Journal of Islamic Marketing	14.17	85
Relationship between product factors, advertising, and purchase intention of halal cosmetic	H SR, H Hashim, RN Yusof, NN Alias	2013	Pertanika Journal of Social Science and Humanities	8.10	81
A qualitative investigation into consumption of halal cosmetic products: The evidence from India	Shahid, S.	2018	Journal of Islamic Marketing	14.80	74
Muslim consumers' purchase behavior towards halal cosmetic products in Malaysia	Haque, A.	2018	Management Science Letters	13	65
The emerging Halal cosmetic and personal care market	M Hunter	2012	Personal Care	5.64	62
Online purchase intention of halal cosmetics: Stimulus-Organism-Response framework application	Suparno, C.	2020	Journal of Islamic Marketing	143	16
Purchase behavior of the millennial female generation on halal cosmetic products	Handriana, T.	2020	Journal of Islamic Marketing	27.0	55

Determinants of purchase Intention of halal cosmetic products among Generation Y consumers	Khan, A Sarwar, BC Tan	2021	Journal of Islamic Marketing	26.00	52

Note: TC-Total Citations, C/Y – Cited Per Year

Productive Journals: Based on the data of the Scopus database, 15 journals were recognized as the most productive in publishing halal cosmetics publications over 11 years from 2012 to 2023. Table 4 shows that the Journal of Islamic Marketing has the highest productivity with 13 publications, followed by the International Journal of Supply Chain Management which has four publications. Both publications originated in the United Kingdom and have SCImago Journal Rank values of 0.52 and 0.19, respectively. The results show that the majority of the top 15 productive journals are from the United Kingdom and India. The Malaysian Journal of Consumer and Family Economics and Global Journal Al Thaqafah are two of the journals featured. With a score of 39, the Journal of Islamic Marketing has the highest H-index.

Table 5: Top 15 Productive Journals Publishing Articles in the Halal Cosmetics Supply Chain

Journal	2012-2023	Sjr	H	Cs	Snip	Country of Origin
Journal of Islamic Marketing	16	0.551	43	4.7	1.24	United Kingdom
International Journal of Supply Chain Management	4	0.19	17	1	0.438	United Kingdom
Malaysian Journal of Consumer and Family Economics	3	0.175	3	0.4	0.212	Malaysia
Global Journal Al-Thaqafah	3	0.176	6	0.3	0.237	Malaysia
Advanced Science Letters	2	0.126	27	0.4	0.316	United States
Humanities and Social Sciences Reviews	2	0.663	9	0.6	0.457	India
Journal of Islamic Accounting and Business Research	2	0.359	22	2.2	0.828	United Kingdom
Journal of Islamic Monetary Economics and Finance	2	1.0	8	1.0	1.0	Indonesia
Academy of Entrepreneurship Journal	1	0.205	12	1.1	0.384	United States
Applied Biological Chemistry	1	0.417	21	3.2	0.836	Netherland
Asia Pacific Management Review	1	0.711	20	5	2.001	Taiwan
Bali Medical Journal	1	0.117	4	0.5	0.302	Indonesia
Cogent Arts and Humanities	1	0.169	7	0.5	0.73	United Kingdom
Cosmetics	1	0.449	21	3.4	1.003	Switzerland
FWU Journal of Social Sciences	1	0.231	3	0.4	0.439	Pakistan

Note: SJR – SCImago Journal Ranking/ H – H-Index

Top Ten Authors: To identify the authors who published the most publications in the halal cosmetics supply chain field, Microsoft Excel is used to analyze the data. The top ten authors are listed in Table 5. The result shows that Ngah, A. H. has three publications, while seven authors have two publications each. The remaining two authors have one publication each. Based on the results, it can be understood that there are no dominant authors in the field as it is still in the initial growing stage. Table 6 also shows the citation and the H-Index of the top authors that have the most publications in the halal cosmetics supply chain field. The analysis shows that Ngah, A. H., Abd Rahman and Islam have the highest citations and H-Index.

Table 6: Top Ten Authors with the Most Publications on the Halal Cosmetics Supply Chain

Authors	No. of publications	Citations	H-index
Ngah, A.H.	3	771	15
Abdinagoro, S.B.	2	129	6
Al Rasyid, H.	2	7	1
Arbak, S.	2	2	1

Islam, R.	2	758	15
Mohamed, R.H.N.	2	27	2
Putri, T.U.	2	3	1
Yeo, B.L.	2	2	1
Ab Rahman, S.	1	314	8
Abd Rahman, A.	1	900	15

Affiliated Organizations: Data are analyzed using Excel to retrieve the author's origin and affiliated organizations. Table 7 shows the top ten organizations publishing the most halal cosmetics supply chain articles. Universiti Teknologi MARA (UiTM) in Malaysia published six articles, followed by Universiti Utara Malaysia and Universiti Putra Malaysia with three articles. UiTM is the leading contributing organisation and this university's authors are also among the top ten authors with the most papers on halal cosmetics supply chain.

Table 7: Top Ten Organisations Contributing to the Topic of Halal Cosmetics Supply Chain

No. of Publications	Location	Organization
6	Malaysia	Universiti Teknologi MARA
4	Malaysia	Universiti Putra Malaysia
3	Malaysia	Universiti Utara Malaysia
3	India	Jamia Millia Islamia
3	Malaysia	Universiti Malaya
3	Indonesia	Universitas Airlangga
3	Malaysia	Universiti Malaysia Terengganu
3	Indonesia	Bina Nusantara University
3	Malaysia	Tunku Abdul Rahman University of Management and Technology
2	Malaysia	Universiti Sains Malaysia
2	Malaysia	Universiti Kebangsaan Malaysia

Co-Citation Analysis: It is used to measure the influence of academia in the study area. A publication or an author is considered influential in the field of study if the citation index is high. The network of co-citation is visualized in Figure 3 while the top ten authors of halal cosmetics research are listed in Table 6. VOSviewer bibliometric software is used to generate the results. The authors are the unit of analysis in the study that uses co-citation analysis. The relatedness of the writers is assessed by the degree of their citation within the same publication in co-citation analysis. According to Ahmi et al. (2020), when two authors are cited in the same work, their relationship becomes more apparent. Therefore, the authors who have a minimum citation of 10 ten times are selected in this study.

Table 8: The Ten Prominent Authors with the Highest Total Link Strength

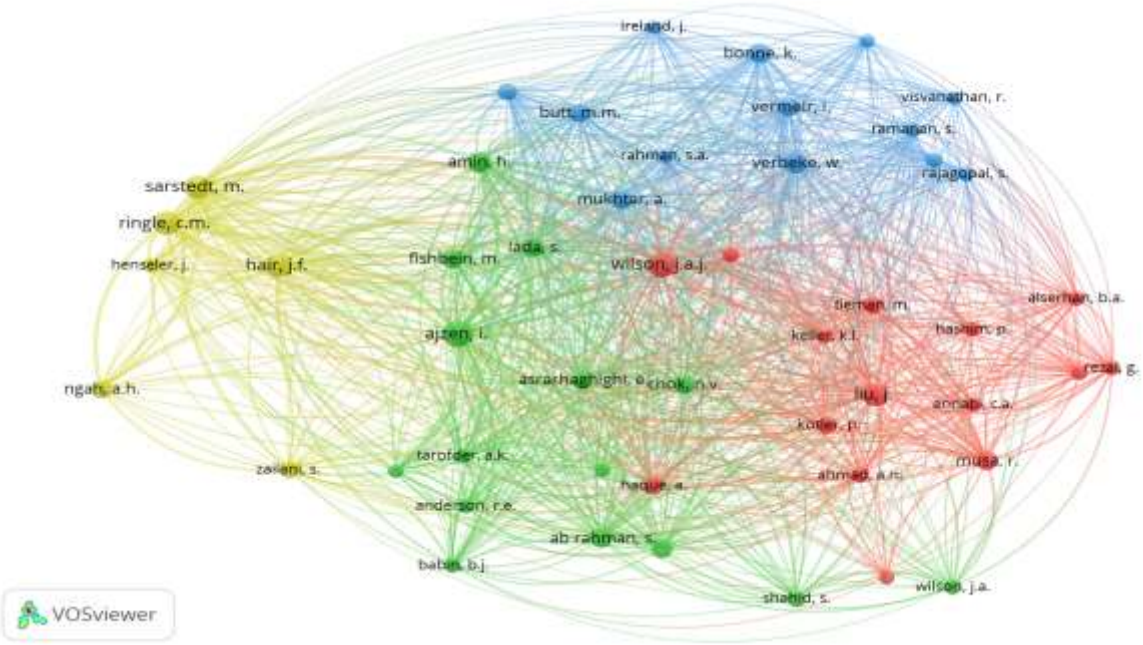
Authors	Citations	TLS
Ajzen, I.	35	925
Wilson, J.A.J.	31	855
Hair, J.F.	29	712
Liu, J.	27	696
Ringle, C.M.	29	680
Sarstedt, M.	27	668
Verbeke, W.	23	591
Amin, H.	21	568
Ab Rahman, S.	19	509
Fishbein, K.	18	478

Note: TLS – Total Link Strength

According to the data, only 49 of the 3405 authors meet the threshold. For the co-citation network analysis, these 49 writers are chosen. The overall strength of co-citation linkages for each author with other writers is calculated in the analysis. Table 8 only displays the ten authors with the highest total link strengths among the

49 authors. Figure 4 depicts a network of co-citations in the halal cosmetic supply chain. The size of the bubble denotes the number of citations for the article, and the line thickness represents the relatedness strength of co-citations. Ajzen, I. was identified as the author with the greatest total link strength (925) and the greatest number of citations (35). Different colors are used to indicate the cluster difference to which the article is related. Figure 4 depicts the co-citation network analysis generated for four clusters related to the halal cosmetics concept. The red hue denotes the most powerful cluster, with 15 items, followed by green, also with 15 pieces. Blue has the third strongest cluster with 13 items, and yellow has the weakest cluster with six things.

Figure 4: Visualising Co-Citation Network in Halal Cosmetic Supply Chain Research



Based on the VOSviewer analysis, there are four optional clusters (Clusters 1,2,3 and 4). As listed in Table 9, each cluster can be seen as having a common research area. Group 1 is Cluster 1, covering topics that include consumer behavior, halal certification, and halal perspective. Group 2 is Cluster 2 which discusses knowledge, religiosity, and attitude towards halal cosmetics and consumer purchase intention in halal cosmetics. Group 3 is Cluster 3, which discusses purchase intentions for halal cosmetics and personal care items, as well as the halal concept. Lastly, Cluster 4 discusses the option of halal and the awareness of consumers of halal cosmetics.

Table 9: Top Articles in Each Cluster Based on Co-Citation in Halal Cosmetics Supply Chain Research (2012-2023)

Cluster 1	Cluster 2	Cluster 3	Cluster 4
Ahmad, A.N.	Ab Rahman, S.	Alam, S.S.	Hair, J.F.
Alserhan, B.A	Abd Rahman, A.	Bergeaud-Blacker, F.	Henseler, J.
Annabi, C.A.	Ajzen, I.	Bonne, K.	Ngah, A.H.
Haque, A.	Amin, H.	Butt, M.M.	Ringle, C.M.
Hashim, P.	Anderson, R.E.	Ireland, J.	Sarstedt, M.
Keller, K.L.	Asrarhaghighi, E.	Mukhtar, A.	Zailani, S.
Kotler, P.	Aziz, Y.A.	Rahman, S.A.	
Liu, J.	Babin, B.J.	Rajagopal, S.	
Mohamed, Z.	Black, W.C.	Ramanan, S.	
Musa, R.	Chock, N.V.	Satapathy, S.	
Rahman, A.A.	Fishbein, M.	Verbeke, W.	
Rezai, G.	Lada, S.	Vermeir, I.	
Schiffman, L.G.	Shahid, S.	Visvanathan, R.	

Tieman, M.	Tarofder, A.K.
Wilson, J.A.J.	Wilson J.A

Co-Word Analysis: Co-occurrences of the keywords analysis are conducted after the co-citation analysis. Figure 4 illustrates the co-word network of the halal cosmetics supply chain. In Table 10, the ten prominent co-words in halal cosmetics supply chain research are listed. VOSviewer bibliometric software is used to generate the data. The co- words are the fact of two or more things that occur together simultaneously. According to Ahmi et al. (2020), the co-word analysis implies how two or more keywords are paired within the database. Therefore, this study selects two as the minimum number of keyword occurrences. Out of 216 keywords found, only 30 keywords meet the threshold. The 30 keywords are selected for co-words analysis where the total strength of the co-words in the keyword links with other keywords is calculated. Nevertheless, Table 10 only displays the ten most prominent keywords with the highest total link strengths. Referring to the diagram in Figure 5, the number of keywords received by the articles is presented in the circle size while the line thickness presents the strength of co-words relatedness. The study has identified the keyword with the highest total link strength (33) and the number of occurrences (26).

Figure 5: Visualising Co-Word Network in Halal Cosmetics Supply Chain Research

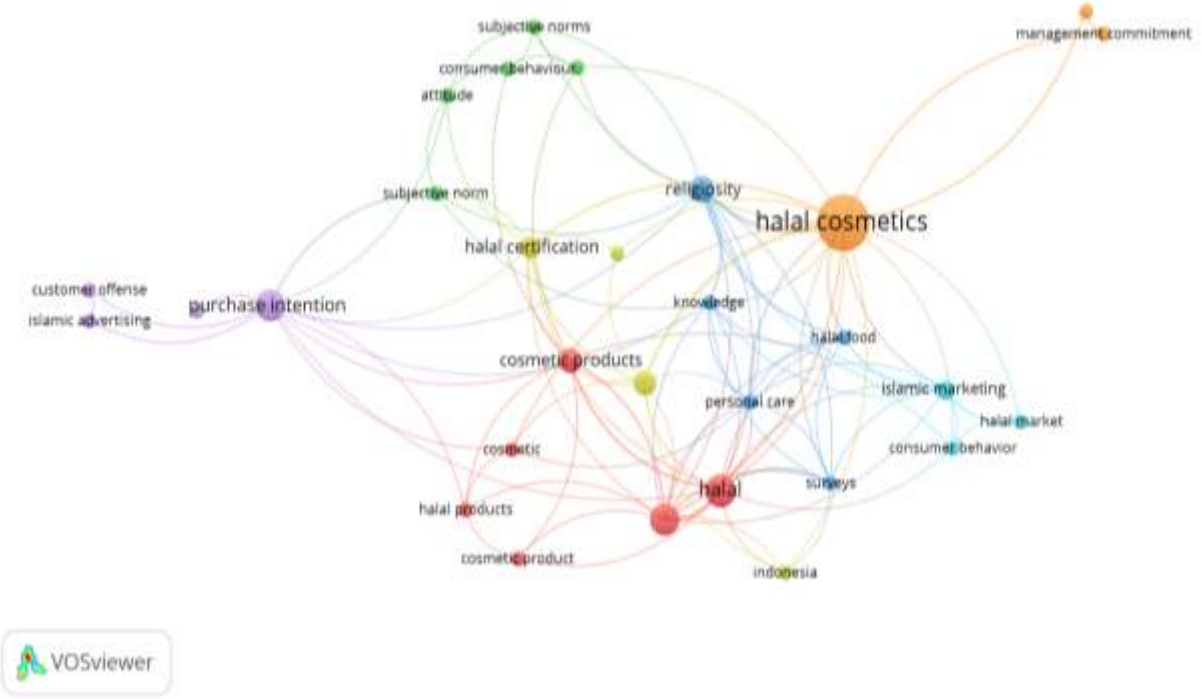


Table 10: The Ten Prominent Co-Words with the Highest Total Link Strength

Keywords	Occurrences	TLS
Halal cosmetics	26	33
Halal	9	23
Cosmetics	8	22
Religiosity	6	18
Purchase Intention	8	16
Cosmetic Products	5	13
Malaysia	5	13
Islamic Marketing	3	12
Halal Certification	4	11
Knowledge	2	11

Note: TLS – Total Link Strength

As shown in Figure 6, co-word analysis developed seven related to one concept of halal cosmetics. The different colors show the difference in the cluster in which the article is associated. The strongest cluster is red colored with six items, followed by green and dark blue clusters with five items. Next, the third strongest clusters are yellow and purple with four items, respectively. Lastly, the weakest clusters are orange and soft blue with three items each. The categorization of the keywords in this research on the halal cosmetics supply chain is shown in Table 11. The keywords are categorized based on seven different clusters. The first cluster comprises seven keywords that focus on cosmetics. The second cluster entails five keywords focusing on consumers, such as consumer behavior and subjective norms. The third clusters also comprise five keywords that focus on knowledge, such as knowledge in personal care. Clusters four and five contain four keywords categorized in halal foundation and awareness. Lastly, clusters six and seven comprise three keywords categorized into theme marketing and concept development. The detailed keyword categorization of this halal cosmetics supply chain research is shown in Table 11.

Figure 6: The Network Co-Words of Halal Cosmetics Supply Chain Research from 2012 To 2023

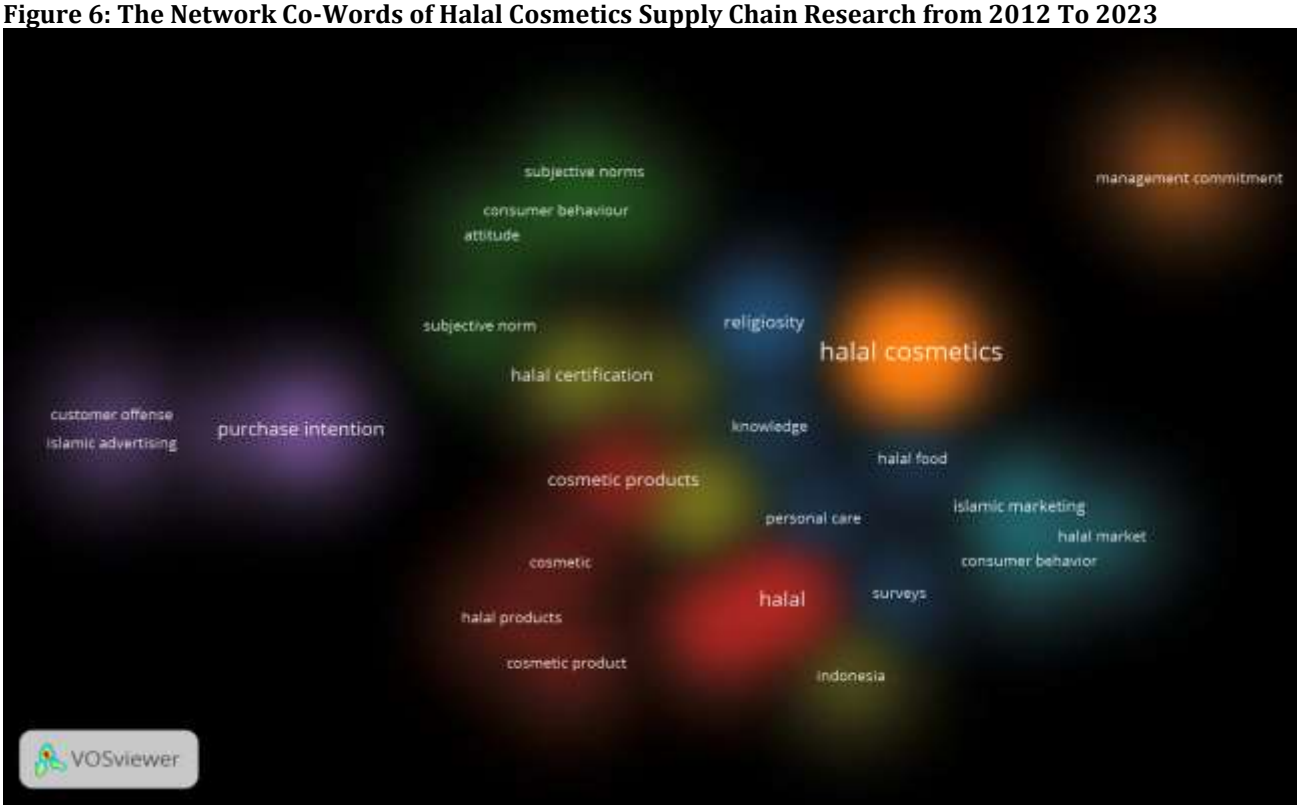


Table 11: Co-Word Clusters in Halal Cosmetics Supply Chain Research (2012-2023)

Clusters	Themes	Keywords (Weight occurrence)
1	Cosmetics	Cosmetic (2), Cosmetic product (2), Cosmetic products (5), Cosmetics (8), Halal (9), Halal product (2)
2	Consumer	Attitude (2), Consumer behavior (2), India (2), Subjective norms (2), Subjective norm (2)
3	Knowledge	Knowledge (2), Personal care (2), Religiosity (6), Surveys (2), Halal food (2)
4	Halal Foundation	Cosmetics manufacturer (2), Halal certification (4), Indonesia (2), Malaysia (5)
5	Awareness	Customer Offence (2), Halal cosmetic (2), Islamic advertising (2), Purchase intention (8)
6	Marketing	Consumer behavior (2), Halal market (2), Islamic marketing (3)
7	Concept Development	Halal cosmetics (26), Management commitment (2), Statistical process control (2)

5. Conclusion and Future Research Directions

The halal cosmetics supply chain is gaining popularity in research studies, attracting more scholars globally. Through bibliometric analysis, this study developed the network map of co-citation analysis and co-word analysis. All the publications published from 2012 to 2023 were taken from the Scopus database using Publish or Perish software. A total of 58 articles in this research area were retrieved. Although the number of articles is small, the data have shown an increasing number of publications since 2012. The publication years for all 58 articles indicate that the halal cosmetics supply chain field has gained interest in the academic world. There were many influential articles published between the year 2012 and 2020. In 2022, the data showed a substantial increase in publication in this area. ASEAN researchers have published an increasing number of articles in recent years. Authors from Malaysia and Indonesia are the most productive researchers published in this area. This research also analyzed primary publications, prominent institutions, and the best papers published. Based on the analysis, the most productive journals that published the highest number of articles on halal cosmetics supply chain are the Journal of Islamic Marketing and the International Journal of Supply Chain Management. This study also revealed that the most cited authors are Abd. Rahman and Ahmad received the highest citations (524 and 262, respectively).

Additionally, our investigation discovered that halal cosmetics, which appears 26 times as the top co-word, is the most prominent co-word with the highest overall link strength. Interestingly, the study produced seven clusters with different themes such as cosmetics, consumer, knowledge, halal foundation, awareness, marketing, and concept development. From these clusters, many research opportunities can be developed in the future. For example, applying industry 4.0 technology such as blockchain technology and artificial intelligence to support downstream halal cosmetics supply chains can be categorized under the marketing cluster. Meanwhile, the concept of a development cluster can focus on effective management and the best practices of creating halal cosmetics products so that they will be Shariah compliant. Furthermore, the awareness cluster can explore more specifically the context of consumer purchase intention and brand positioning. This study has revealed remarkable findings. Nevertheless, several limitations exist in this study. Firstly, this study only focused on articles extracted from the Scopus database. Although Scopus covers more articles than other databases, some articles might be missing. Thus, other bibliographic databases such as Web of Science, Emerald, and ProQuest can be employed for future research. Secondly, despite the increasing number of publications, the halal cosmetics supply chain study is still limited. Therefore, future research should explore more on the halal cosmetic supply chain domain.

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Factors Influencing Knowledge-Sharing Behavior Among Academicians in Technical and Vocational Education and Training Institutions

Wan Zuhaila Wan Abd. Rahman[1], Ahmad Suffian Mohd. Zahari[2] & Zalinawati Abdullah[2]
[1]Faculty of Business Management, Universiti Teknologi MARA, 40000 Shah Alam, Selangor Malaysia
[2]Faculty of Business Management, Universiti Teknologi MARA Cawangan Terengganu, 23000 Dungun, Terengganu, Malaysia
*wzuhaila@uitm.edu.my, ahmadsuf@uitm.edu.my, zalin5026@uitm.edu.my

Abstract: The key concern of technical and vocational education and training (TVET) institutions is to generate graduates of high caliber. The TVET institutions endeavor to best serve the community and the nation. Being productive in their area of expertise will determine the extent to which TVET institutions can compete to provide the best education globally. Accordingly, academicians' perceptions and personalities were assessed to identify the factors contributing to knowledge-sharing behavior (KSB). The academicians were selected from premier polytechnics in Malaysia through purposive sampling. Analysis was conducted with partial least square structural equation modelling. Resultantly, KSB reflected moderate variance whereas knowledge-sharing intention (KSI) had weak variance. The results suggested that KSI moderately influenced KSB. The academicians' KSI positively influenced their KSB. Nevertheless, individual perception did not significantly affect academicians at KSB. The findings on Malaysian TVET academicians' KSB can be a general benchmark for other technical and vocational institutions. Future researchers could focus on other individual factors that might influence KSB, such as religiosity.

Keywords: *Knowledge-sharing behavior, individual perception, personality, higher learning institution.*

1. Introduction and Background

Educational institutions and colleges share knowledge to remain relevant and competitive. While knowledge-sharing is successful only if academicians are willing and share their knowledge freely, few academicians truly share their knowledge. Some individual traits might result in the intention to share their knowledge, but actual knowledge-sharing does not occur. The Malaysian government committed RM 6.8 billion in 2024 to implement a range of technical and vocational education and training (TVET) projects (Bernama, 2023). If TVET institutions do not effectively share knowledge, this significant investment would be rendered ineffective. The TVET institutions should foster a culture that promotes knowledge sharing among academicians through teaching and collaborative learning. Organizational performance can be significantly impacted by fostering a culture of knowledge sharing that enhances employees' capacity to tackle organizational difficulties and challenges (Alshamsi & Ajmal, 2018). In general, knowledge can be classified into two categories: implicit knowledge and explicit knowledge. Explicit knowledge is regarded as substantially less costly due to its impersonal nature, while tacit knowledge is deemed more expensive and highly valuable (Reychav & Weisberg, 2010).

It is simple for academicians to communicate and acquire explicit knowledge. As tacit knowledge cannot be obtained or accessed easily (only the person who owns the knowledge can share it), it is intangible and thus considered tacit knowledge to be more valuable than explicit knowledge (Goh & Sandhu, 2013). Preserving tacit knowledge relies on understanding individual traits, which include individual perception and personality. Most TVET institution academicians are subject area experts whose knowledge is typically private and known only to them. Thus, such knowledge will be lost if shared inappropriately. Nevertheless, some academicians choose not to share their knowledge due to individual, organizational, and technological factors (Riege, 2005). Improper knowledge-sharing leads to a dearth of new knowledge, research, and innovations. Furthermore, studies to understand knowledge-sharing in TVET institutions are scarce compared to those of other higher education institutions (HEIs). Thus, this study is important for academicians as well as upper-level management.

Besides, educating students has become increasingly challenging in the present times. Knowledge-sharing behavior (KSB) can aid academicians' teaching and learning productivity, creativity, and innovation. Thus, the current research questions focused on the underexplored aspects of the individual factors of knowledge-

sharing: Do individual perception and personality affect KSB and knowledge-sharing intention (KSI)? Does KSI affect KSB? According to Al-Kurdi (2018), there is a shortage of research on knowledge-sharing within higher education institutions (HEIs) when compared to other industries. Meanwhile, the studies conducted by Akbari and Ghaffari (2017), Razi, Habibullah, and Hussin (2019), and Annansingh et al. (2018) were done in higher education institutions (HEIs) and have all found a strong and statistically significant correlation between knowledge sharing behavior (KSB) and individual variables in both public and private HEIs. Although the production of superior outcomes is more likely when highly skilled academicians are involved, research is scarce on knowledge sharing in TVET institutions. The findings of this study have the potential to improve the knowledge of academicians and result in the production of students with greater quality in TVET institutions.

2. Literature Review

Knowledge-Sharing: Knowledge-sharing, commonly referred to as "knowledge exchange" and "knowledge transfer", is the process of utilizing specialist knowledge to assist others and address organizational problems (Amayah, 2013). Knowledge-sharing is a crucial component of knowledge management where employees explain what they know to others to resolve workplace issues. Employees individually learn the “common knowledge” when conducting organizational tasks and allow other organizational members to access their knowledge and experience by sharing their interpretations. Numerous studies have examined knowledge-sharing from technological, organizational, and individual behavior perspectives in different fields, such as HEIs, banks, hotels, information technology (IT) companies, hospitals, non-profit organizations, and public organizations. Many factors, such as organizational culture, the nature of the technology, and the individual’s values and attitudes toward sharing characterize knowledge-sharing. Nevertheless, most of the discussions described in the following sections emphasized individual behaviors (Cyr & Wei Choo, 2010; Chedid, Alvelos & Teixeira, 2022).

Individual Perception: The effectiveness of knowledge-sharing is dependent on an individual's perspective and reality (Davenport & Prusak, 1998). An individual's judgment of the importance and transfer of information or teaching material is essential to the sharing of knowledge. The impression of owning information is considered crucial and has a favorable correlation with the act of sharing knowledge (Jarvenpaa & Staples, 2001). In a study conducted by Khan (2014) on information-sharing in the Dhaka University library, it was discovered that 91% of participants perceived users as easily approachable when it comes to exchanging knowledge. According to Wiewiora, Murphy, and Trigunarsyah (2010), perception plays a role in increasing employees' trust, which can be a motivating element for success in knowledge-sharing. In their study, Hidayanto et al. (2015) emphasized the importance of perception and recommended that an assessment of employees' perceptions be conducted to evaluate the environment for knowledge sharing inside a company.

They added that the intrinsic qualities of employees are of greater significance compared to their extrinsic counterparts. Alhawary (2017), and Reger, Jennifer, and Rachel (2013) found evidence of a robust and favorable correlation between knowledge-sharing intention (KSI) and knowledge-sharing behavior (KSB). This suggests that sharing knowledge has the potential to enhance and strengthen relationships among colleagues, as well as provide career advancement opportunities such as internal promotions or external appointments. Individual perception strongly influences knowledge sharing in organizations (Ishrat & Rahman, 2019). An organization will experience more knowledge-sharing if its employees have higher perceptions of knowledge-sharing. Based on the aforementioned studies, employees’ perceptions significantly and positively influence organizational knowledge-sharing. Thus, the management should consider human perception when designing and implementing effective KSB practices. Accordingly, the following hypothesis was proposed:
H1: Individual perception significantly affects employees’ KSB.

Personality: Personality is crucial to comprehending human behavior (Yesil & Sozbilir, 2013). A person's behavior can be explained by their personality traits, which are psychological qualities (Leri & Theodoridis, 2021). Openness to experience, agreeableness, extraversion, conscientiousness, and neuroticism are the five personality trait categories that make up the Big Five personality theory, which is used to evaluate personality (Laouiti et al., 2022). According to Yesil and Sozbilir (2013), a person's personality has an impact on their performance and ability to share knowledge. According to Wang and Hu (2020), sharing knowledge is considered a personal action. Variations exist in individuals' qualities and interests, as well as in the extent to

which knowledge is conveyed. Several factors, including personality traits, willingness to share, motivation sources, and commitment to the company, influence the extent to which employees share knowledge (Jadin et al., 2013). Mooradian et al. (2006) highlight that the characteristics of the individual who shares knowledge play a crucial role in the process of knowledge-sharing. Abou-Shouk (2022) found that positive personality qualities significantly improved employees' knowledge, skills, and abilities in sharing. Based on the aforementioned data, the following hypothesis was proposed:
H2: Individual personality significantly affects employees' KSB.

The KSI: According to the theory of planned behavior (TPB) and the theory of reasoned action (TRA), intention directly affects individual behavior (Ajzen, 1991). Reychav and Weisberg (2010) reported the correlation of KSI to both explicit and tacit knowledge. Nonetheless, some employees who are unwilling to share their work reports, manuals, models, and expertise and proficiency gained from training and education might hoard their knowledge. Mandating knowledge-sharing is challenging, where the main issue is to convince, coerce, direct, or otherwise persuade employees to share their information (Gupta et al., 2008). Individuals must be willing to share their knowledge continuously. Organizational support can enhance KSB and lead to a desirable culture. Ishrat and Rahman (2019) reported that organizational support fostered a culture in which participants were urged to give freely and responsibly of their knowledge, abilities, resources, and information. Accordingly, academicians' KSI directly affects their sharing behavior (Chang et al., 2015).

The KSB: The KSB refers to employees' behavior that results from their intentions. Knowledge-sharing focuses on expert knowledge to aid others, resolve issues, create novel concepts, or put rules and regulations into effect (Amayah, 2013). People also share knowledge for many other reasons, such as to benefit society (Basu & Sengupta, 2007) and for organizational competitive advantage (Jackson et al., 2006), empowerment (Davenport & Prusak, 1998; Nahapiet & Ghoshal, 1998; Barachini, 2009; Jeon, 2011), extrinsic and intrinsic rewards (Lin, 2007), adding value to others (Hairol Adenan, 2015), and research productivity (Fauzi et al., 2019). The aforementioned studies were conducted in different locations and industries, such as banks, hospitals, professional service firms, pharmaceutics, tourism, and construction. Academicians who share their knowledge have access to more information and are better equipped to seek new ideas and develop thinking paradigms for teaching and learning. Annansingh et al. (2018) reported that HEIs that share knowledge continue to keep expanding, regenerating, learning new things, and becoming more aware of possibilities and threats. Therefore, individual KSB affects HEI productivity. Nevertheless, Turyahikayo and Pillay Muhenda (2021) claimed that most Ugandan public sector employees, specifically those in the Ministry of Public Service, Ministry of Education and Sports, and the Ministry of Justice and Constitutional Affairs, exhibited negative attitudes towards KSB. Some public sector knowledge sharers were discourteous to their knowledge-seeking colleagues.

The KSI and KSB: According to Ajzen (1991), intention refers to a measure of the amount of work one is willing to put in to carry out a behavior. It is a motivating element for that particular activity. In Ajzen's proposed TPB model, it is assumed that behavioral intention positively affects actual behavior. Furthermore, previous studies reported a strong causal relationship between behavioral intention and actual behavior in a broad behavioral category range (Davis, 1989; Mathieson, 1991; Hartwick & Barki, 1994). Lin and Lee (2004) and Tohidinia and Mosakhani (2010) explored KSB with the theoretical TPB model and confirmed that KSI directly influenced KSB. Additionally, Fauzi (2019) reported that all KSI factors, excluding perceived cost, were significantly related to KSI and KSB, thus proving that the underlying theory of TPB could forecast academicians' KSI. Nonetheless, Cyr and Wei Choo (2010), who used social exchange theory, denoted the significant relation of KSI to KSB. Therefore, the following hypothesis was proposed:
H3: The KSI significantly influences employees' KSB.

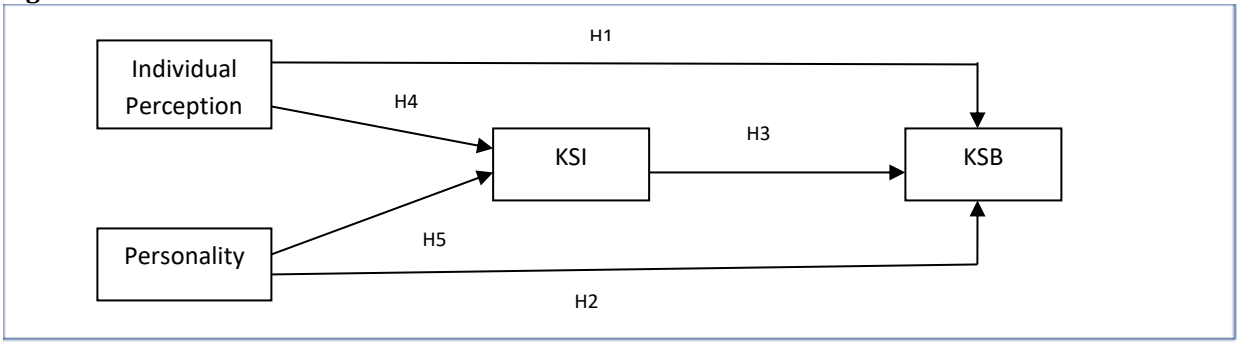
Individual Perception and KSI: Individual perception towards KSI is measured in different contexts. Individual perception positively and directly influenced KSI, where knowledge was shared to increase engagement in value creation (Fait et al., 2023). Hung and Cheng (2013) identified a significant relationship between individual perception of technology and KSI, as technology was deemed useful for sharing knowledge. Thus, improving an individual's degree of perception regarding knowledge-sharing with technology could increase virtual community KSI. Accordingly, the following hypothesis was proposed:
H4: Individual perception significantly influences employees' KSI.

Personality and KSI: Many researchers studied individuals' personalities to determine their KSI. Akbar and Warraich's (2023) study on personality and KSI following John and Srivastava's (1999) Big Five personality inventory revealed that the personality features of agreeableness, openness to experience, and neuroticism contributed significantly to KSI. Agyemang, Dzandu and Boateng (2016) reported that extraversion, agreeableness, openness, and neuroticism affected teachers' knowledge-sharing attitude and behavior, but conscientiousness did not affect KSB. Abdul Manaf and Marzuki (2013) proposed that individuals should possess extraversion, agreeableness, openness to experience, neuroticism, and conscientiousness to enable knowledge-sharing and improve their work performance. Based on the aforementioned studies, the following hypothesis was proposed:
H5: Personality significantly affects employees' KSI.

Theoretical Development: The TPB (Ajzen, 1988) is an extension of the TRA (Ajzen & Fishbein, 1980) and has garnered much attention from social science researchers. Both the TPB and TRA models were designed to provide clear explanations of informational and motivational influences on certain behaviors. The aforementioned theories state that individuals make behavioral decisions by carefully considering available information. Subsequently, many studies on knowledge-sharing widely applied TRA and TPB as their underpinning theories (Syed et al., 2021; Negara et al., 2021; Pham Thi & Duong, 2022; Ahmed et al., 2022; Fait et al., 2023). Many researchers enhanced the TPB by adding more variables, which yielded the extended TPB (Moksness, Olsen & Tuu, 2020; Negara et al., 2021). Furthermore, other researchers in knowledge sharing used and combined other theories, such as the Social Expectation Theory (SET), Technology Acceptance Model (TAM), and Big Five Personality Theory.

Framework

Figure 1: Research Framework



3. Research Methodology

Research Tools: The questionnaire distributed to the respondents consisted of 60 questions in the following sections: A (demographic), B (individual perception), C (personality), D (KSI), and E (KSB).

Item Generation: Every item on the questionnaire was adapted from earlier research by Akhavan et al. (2015), Soto & John (2017), Fauzi et al. (2019), and Bock et al. (2005). Each item was presented in both Malay and English.

Data Collection: Purposive sampling was used to collect data over two months, starting from August 2023 until October 2023 from academicians at three premier polytechnic institutions in Malaysia. The academician population at the three institutions in 2021 totalled 1,331. The Ministry of Higher Education approved the study to be conducted. The academicians were required to respond to the survey online. In total, 144 academicians addressed the questionnaire. After data cleaning to account for missing values, 141 responses were used for analysis.

Analysis Tool: Partial least square structural equation modelling (PLS-SEM) was used for the SEM-based variance following its robustness and the fact that this study was exploratory (Hair et al., 2014). PLS-SEM 4.0

was used, as it can analyze variables and models and check errors simultaneously to ensure the suitability of the theory used. The PLS-SEM 4.0 can analyze complex models that require multiple variable and relationship testing.

4. Results

Descriptive Statistics: There was a total of 141 respondents (113 women and 28 men) (Table 1). Fifty respondents were in the 31–40-year age group, while 71 and 23 respondents were in the 41–50- and 51–60-year age groups, respectively. The respondents held Diplomas (n = 1), Bachelor's degrees (n = 36), Master's degrees (n = 100), and PhDs (n = 7). Eighty-seven respondents were lecturers while 54 respondents were senior lecturers. One respondent had ≤ 5 years of work experience, while 12, 58, 36, 31, and three respondents had work experience of 6–10 years, 11–15 years, 16–20 years, 21–25 years, and ≥ 26 years, respectively.

Table 1: Descriptive Statistics (N = 141)

Measure	Item	Frequency	%
Sex	Male	28	19.8
	Female	113	80.1
Age (years)	31–40	50	35.4
	41–50	68	48.2
	51–60	23	16.3
Education level	Diploma	1	0.7
	Bachelor's degree	36	25.5
	Master's degree	97	68.7
	PhD	7	4.9
Position	Lecturer	87	61.7
	Senior lecturer	54	38.2
Work experience (years)	5	1	0.7
	6–10	12	8.5
	11–15	58	41.1
	16–20	36	25.5
	21–25	31	21.9
	≥ 26	3	2.1

Measurement Model: The first stage of reporting the findings involved measurement model analysis, which consisted of convergent and discriminant validity (Hair et al., 2014). Convergent validity assesses the cross-loading of each item, composite reliability (CR), and the average variance extracted (AVE) of the construct. The AVE must be higher than all related inter-construct correlations to meet the discriminant validity. The results demonstrated that all item loadings met the minimum 0.7 value, excluding the items for individual perception (IP)2 (0.345) and personality (P)5 (-0.143), which were subsequently deleted. The AVE and CR of all constructs exceeded 0.5. In this vein, the construct in the model discriminated against other variables, where other items did not load on other constructs (Hair et al., 2014). Table 2 depicts the discriminant validity of the study.

Table 2: Discriminant Validity (N =141)

Construct	Item	Loading	AVE	CR	Cronbach Alpha	rho_A
Individual perception	IP1	0.917	0.821	0.958	0.945	0.947
	IP3	0.882				
	IP4	0.909				
	IP5	0.926				
	IP6	0.895				
KSB	KSB1	0.929	0.822	0.949	0.928	0.930
	KSB2	0.901				
	KSB3	0.925				

	KSB4	0.870				
	KSI1	0.864				
	KSI2	0.880				
KSI	KSI3	0.910	0.754	0.939	0.918	0.926
	KSI4	0.764				
	KSI5	0.917				
	P1	0.712				
Personality	P2	0.715	0.574	0.870	0.815	0.833
	P3	0.733				
	P4	0.776				
	P6	0.844				

The discriminant validity was assessed using extended discriminant analysis with the heterotrait–monotrait ratio (HTMT) correlation proposed by Henseler et al. (2015). The required HTMT threshold among the constructs was < 0.9. The HTMT correlation is depicted in Table 3.

Table 3: The HTMT Matrix (N = 141)

	Individual Perception	KSB	KSI	Personality
KSB	0.526			
KSI	0.687	0.811		
Personality	0.663	0.646	0.687	

Structural Model: The second stage of results reporting involved structural model analysis, which required the determination of path coefficient and coefficient of determination (R^2). In Table 4, all paths between the variables were significant, excluding the relationship between individual perception and KSB. Individual perception did not positively affect academicians' KSB. Thus, H1 was not supported.

Table 4: Path Coefficient (N = 141)

Hypothesis	Path model	Original sample (O)	T-value	P-value	Confidence interval (BC)		R2	VIF	Decision
					LL	UL			
H1	Individual perception -> KSB	-0.053	0.74	0.459	-0.187	0.091	0.588	1.937	Not significant
H2	Personality -> KSB	0.196	2.366	0.018	0.045	0.367		1.838	Moderately significant
H3	KSI -> KSB	0.666	8.834	0	0.494	0.795		1.977	Strongly significant
H4	Individual perception -> KSI	0.424	5.676	0	0.272	0.562	0.494	1.582	Moderately significant
H5	Personality -> KSI	0.36	3.903	0	0.179	0.533		1.582	Moderately significant

Discussion

The KSI: Many studies reported a positive relationship between an individual's intention and their actual behavior. Employees feel more encouraged to share knowledge if there are sufficient resources and opportunities to engage in such behavior (Wu & Zhu, 2012). The intention is also due to a relationship interaction between the person and other individuals demonstrated in their behavior (Fauzi et al, 2019). The finding of this study is similar to a study done by Xu & Li (2022), showing a positive correlation between instructors' intentions and behaviors related to knowledge sharing. Employees are more likely to share if they

have access to sufficient resources and opportunities for sharing. This is the first study to examine Malaysian TVET academicians' KSB. The academicians' KSI demonstrated that the variables explained 49.4% of the variance. In this study, personality was significantly related to KSB (model fit score = 0.08). Both individual perception and personality were significantly related to KSI. Resultantly, using TPB as the underpinning theory could predict the respondents' KSI. Respondents who were willing to share knowledge believed that knowledge-sharing was advantageous to the institution. The findings paralleled those of Xu and Li (2022), who demonstrated that teachers' KSI positively influenced their KSB.

The KSB: Being an academician requires KSB, which should be inherent and represented by their actions. Thus, KSB is a frequent behavioral habit. The results demonstrated that individual perception and personality were positively related to KSB. Therefore, the factors that would positively influence academicians' KSB were emphasized. The results demonstrated that individuals were significantly more inclined to share their knowledge. Cyr (2009) stated that individuals chose to share with their superiors more frequently than with close or distant colleagues. Possibly, TVET HEI academicians continue to share their knowledge, regardless of their management level.

Individual Perception: Individual perception is unique and influences KSB. For example, the responses in a previous study differed from those of this study. Ishrat and Rahman (2019) reported that employees had higher perceptions of knowledge-sharing which allowed the organization to experience more knowledge-sharing. Nevertheless, the respondents in this study were not prepared to share their knowledge and perceived knowledge-sharing as less important. Therefore, the result was insignificant. More activities, training, and exposure prove necessary to overcome the aforementioned barriers to knowledge-sharing. Consequently, academicians will perceive knowledge-sharing as important to their careers and convert knowledge-sharing into a culture.

Personality: Overall, the respondents possessed good personal characteristics that allowed them to communicate and share their knowledge. They were willing to share their knowledge and considered the knowledge-sharing part of their work. Nonetheless, the respondents were uncertain of their knowledge-sharing capabilities. Overall, the findings indicated the high possibility of KSB implementation in TVET institutions if knowledge-sharing initiatives were appropriately accounted for.

5. Managerial Implications and Recommendations

The findings were consistent with the outcomes of prior research conducted by Davenport and Prusak in 1998, as well as by Khan in 2014. In their study, Gagné et al. (2019) discovered that organizations can effectively motivate employees to engage in information sharing by fostering an understanding of its significance and creating an enjoyable environment for it. This has the potential to alter individual perceptions regarding KSB. Therefore, future studies on academicians' KSB should examine the influence of organizations in greater detail. In addition, other personal aspects, such as an individual's level of religious devotion, should be taken into account. Religion can influence individuals' conduct in carrying out their work. Research on KSB in polytechnics is limited, particularly concerning the need for a more comprehensive investigation.

Given the significant financial allocation by the Malaysian government for technical education in 2024, it is recommended to conduct further studies on TVET. Due to the widespread use of technology in knowledge management, future research on knowledge-sharing is anticipated to incorporate technology as a moderator. Conducting a more thorough investigation and enhancing the connections between factors could be beneficial. The results can be utilized to foster a culture of knowledge sharing Education Institutions HEIs can achieve success and long-term viability by establishing a conducive environment for sharing information. Upper management must possess a comprehensive understanding of the unique characteristics of present and potential employees. They should leverage employees who have a strong inclination to share information by providing them with the necessary assistance and resources.

Conclusion

Knowledge is the main thrust of HEI that requires it to be managed effectively. The presence of academicians with the highest KSB is essential for HEI growth and sustainability. Academicians of all levels should share their

knowledge and expertise. Academicians who share their knowledge without omitting any details out of self-interest would be beneficial to a HEI. Nevertheless, having good KSI is insufficient if a person is unwilling to share their knowledge with others in the HEI. The results demonstrated that all hypotheses except H1 were significant for understanding academicians' KSB. The findings indicated that the individual perception variable was insignificant. Academicians should recognize the significance of KSB and possess the necessary abilities to utilize them effectively. Furthermore, promoting KSB in HEIs would aid academicians in achieving their performance indexes and annual promotion requirements. Overall, the results could aid TVET enhancement and allow premier polytechnics to compete against other public universities in Malaysia.

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Religious Practices Position in Firm Performance: A Case of the Malaysian Construction Industry

Ahmad Suffian Mohd Zahari[1], Rosman Mahmood[1], Zuriyati Ahmad[1] & Azzri Fazril Rosman[2]
[1]Faculty of Business and Management, MARA University of Technology Terengganu, Dungun, Malaysia
[2]Public Work Department Kuala Lumpur, Malaysia
*ahmadsuf@uitm.edu.my, rosmanma@uitm.edu.my, zuriy271@uitm.edu.my, azzri@jkr.gov.my

Abstract: The construction sector is one of the main contributors to a country's economic growth and development. However, the sector is often associated with several issues such as abandoned projects, being unable to be completed in the proper period, or not complying with the standards in the contract. Among the factors that cause this failure is related to developer personality characteristics that impact project management efficiency. Therefore, the study's objective is to assess the influence of elements in religious values and entrepreneurial factors on the performance of firms in the construction sector. A total of 226 respondents from contractors of various registration grades were used as the study sample. The results of the multiple regression analysis found that the religious factor did not affect the firm's performance. This is linked to the attitude of contractors who often turn their backs on religious values and instead use common sense in making decisions and actions. However, all entrepreneurial factors (entrepreneurial competencies, management practice and innovation) show a significant positive influence on firm performance in the construction sector. From a policy perspective, this study highlighted to various stakeholders in the construction industry the existence of laxity in the practice of religious values among contractors which is an obstacle to achieving better performance in the implementation of a project. Concerning that, the emphasis on religious values needs to be applied thoroughly in every training program in addition to empowering entrepreneurial values based on innovation. All of these values are important elements in ensuring a firm's sustainable comparative advantage and performance in the construction sector.

Keywords: *Construction industry, Firm performance, religious values, Entrepreneurial factors.*

1. Introduction

The term "construction product" typically refers to any material or item used in the construction industry to build or enhance structures. These products can vary greatly in nature, from raw materials like concrete, steel, and timber, to finished products like doors, windows, and flooring materials. The construction industry encompasses a wide range of activities related to the planning, design, construction, and maintenance of buildings, infrastructure, and other structures. It's a multifaceted sector that involves various professionals, companies, and stakeholders working together to bring projects to fruition. Construction in Malaysia is a vibrant sector, contributing significantly to the country's economic growth and development. These construction products form the backbone of the Malaysian construction industry, supporting the development of infrastructure, residential, commercial, and industrial projects across the country. Their availability, versatility, and contribution to various aspects of construction make them indispensable to the development and progress of the nation. The production and supply of construction products support ancillary industries such as manufacturing, transportation, logistics, and retail. This interconnected network of industries contributes to the overall resilience and growth of the construction sector.

The Malaysian government plays a crucial role in promoting the construction industry through infrastructure projects, housing programs, and regulatory frameworks that ensure quality standards and safety requirements for construction materials. The construction sector serves as a catalyst for economic growth by generating employment opportunities, stimulating demand for goods and services, and attracting investments. The sector employs a diverse workforce ranging from skilled laborers to engineers and architects, thereby providing livelihoods for a significant portion of the population. Infrastructure Development: Construction projects related to infrastructure development, such as roads, bridges, railways, ports, airports, and utilities, are crucial for enhancing connectivity, facilitating trade, and promoting regional development. In Malaysia, ongoing investments in infrastructure projects under initiatives like the Economic Transformation Program (ETP) and the Eleventh Malaysia Plan have been key drivers of economic growth. The construction sector contributes to Malaysia's real estate and property development industry, which encompasses residential, commercial, and

industrial properties. Urbanization and population growth drive demand for housing and commercial spaces, leading to the development of residential complexes, office buildings, shopping malls, and industrial parks. Malaysia's thriving tourism industry relies on the construction of infrastructure and facilities such as hotels, resorts, recreational centers, and transportation networks. Investments in tourism-related projects contribute to the country's attractiveness as a destination for both domestic and international tourists, thereby boosting revenue and employment opportunities. The Malaysian government actively promotes the construction sector through policies and initiatives aimed at fostering sustainable growth, enhancing competitiveness, and supporting innovation. For instance, the Construction Industry Transformation Program (CITP) emphasizes enhancing productivity, quality, and sustainability across the construction value chain. Malaysia's favorable business environment, strategic location, and robust infrastructure make it an attractive destination for foreign investors seeking opportunities in the construction sector. Foreign direct investment in construction projects contributes to technology transfer, knowledge exchange, and the development of local capabilities. The construction sector has been a significant contributor to Malaysia's GDP over the years, although its contribution has varied due to several factors. Historically, the construction sector has played a crucial role in Malaysia's economic development. During periods of rapid urbanization and industrialization, such as in the 1980s and 1990s, the construction industry experienced substantial growth.

According to data from the Department of Statistics Malaysia, the construction sector's contribution to Malaysia's Gross Domestic Product (GDP) has varied over the years, influenced by factors such as government infrastructure spending, private sector investment, and economic conditions (Khan et al., 2014). Large-scale infrastructure projects, including highways, airports, and industrial facilities, contributed to the sector's robust performance. The construction sector's performance in Malaysia has often been closely tied to government spending on infrastructure projects. During times of increased government investment in infrastructure development, such as during economic stimulus packages or national development plans, the construction sector experiences a boost in activity, leading to a higher contribution to GDP. In the late 2010s, Malaysia's construction sector faced challenges such as declining public investment in infrastructure projects and slower economic growth. The sector experienced some moderation in growth, with construction activity slowing down due to factors like fiscal consolidation measures and external uncertainties. However, private-sector investment in residential and commercial developments partially offset the decline in public-sector construction activity. Despite these challenges, the construction sector continued to make a significant contribution to Malaysia's GDP, albeit at a more moderate pace compared to previous years. For example, in 2019, the construction sector accounted for around 4.5% of Malaysia's GDP.

However, it's important to note that this figure can fluctuate from year to year based on various factors such as government policies, economic cycles, and global market trends (Ministry of Finance, 2022). For the most up-to-date and accurate information on the contribution of the construction sector to Malaysia's GDP, I recommend referring to reports and statistics published by official sources such as the Department of Statistics Malaysia or other relevant government agencies. These organizations typically provide regular updates on economic indicators, including the contribution of different sectors to GDP. The Public Works Department (PWD) in Malaysia has recognized the potential benefits of Building Information Modelling (BIM) in improving construction project management PWD acknowledged that BIM technology offers various advantages over traditional construction methods. BIM allows for the creation of digital representations of the physical and functional characteristics of buildings and infrastructure. This enables stakeholders to visualize the project in a 3D model, facilitating better design coordination, clash detection, and improved decision-making throughout the project lifecycle. Introducing Building Information Modelling (BIM) into construction project management is a significant step forward, and the involvement of the Public Works Department (PWD) in Malaysia underscores its importance in the country's construction industry.

BIM facilitates collaboration and communication among stakeholders involved in construction projects. With BIM, architects, engineers, contractors, and other parties can work on a shared digital platform, enabling real-time collaboration, coordination, and information sharing (Eadie et al., 2014). This enables better design exploration, analysis, and coordination during the planning phase, leading to more efficient and optimized designs (Azhar, et al., 2008b. BIM helps streamline project workflows, automate repetitive tasks, and reduce errors and rework. By utilizing BIM's capabilities for clash detection, quantity take-off, and scheduling, project teams can identify and resolve issues early, leading to improved efficiency and productivity throughout the

construction process (Azhar, 2008b). By optimizing designs, minimizing conflicts, and improving coordination, BIM can help reduce construction costs and shorten project timelines. The ability to simulate and visualize construction sequences and logistics can lead to more accurate scheduling and resource allocation, ultimately resulting in cost and time savings (Eadie et al., 2014 (Mahmood et al., 2022) (Ismail et al., 2017. PWD's introduction of BIM in construction project management reflects a proactive approach to embracing digital transformation and innovation in the construction industry. By leveraging BIM technology, PWD aims to enhance project efficiency, collaboration, and quality while driving towards its goals of sustainable infrastructure development in Malaysia.

In addition, the presence of religion in construction is sparsely covered in literature. Literature on this area is very few among Malaysian researchers. Although the construction industry has attracted researchers, most studies have been done on the construction industry that revolve around the study of technology as design analysis. There is a lack of studies on religiosity in the construction industry. Moreover, different conditions have been evaluated based on regional peculiarities and circumstances. In the United Kingdom, for example, norms and traditions were considered, in other countries including Hong Kong and China these norms differ and vary generally (Umeokafor & Windapo, 2019). Most importantly, none of these studies was religion considered an important driving factor in the development of relations among parties (Umeokafor & Windapo, 2019). Therefore, further studies may seek to understand the impact of religion from an interpretivist perspective. Therefore, the main objective of this paper is to assess a direct analysis of the relationships such as religious values; entrepreneur-specific factors; business strategy and innovation and firm performance among contractors who have used BIM applications in the construction of project management. Literature often discusses the technological aspects of BIM, including software tools, platforms, and standards. Researchers explore the capabilities of BIM software in creating digital representations of buildings and infrastructure, facilitating collaboration among project stakeholders, and integrating various design disciplines.

Scholars highlight numerous benefits associated with the adoption of BIM in construction projects. These benefits include improved design coordination, clash detection, visualization, and simulation capabilities, leading to enhanced project outcomes in terms of cost, schedule, and quality. Despite its potential benefits, BIM implementation faces several challenges and barriers. The literature discusses issues such as high initial costs, lack of BIM expertise among stakeholders, interoperability issues, resistance to change, and legal and contractual concerns. Understanding and addressing these challenges are crucial for successful BIM adoption. BIM promotes collaboration and interdisciplinary integration by providing a common platform for architects, engineers, contractors, and other stakeholders to share and coordinate project information. The literature discusses collaborative BIM workflows, virtual design and construction (VDC) methodologies, and integrated project delivery (IPD) approaches that leverage BIM for improved project outcomes. BIM's contribution to sustainability and lifecycle management is another area of focus in the literature. Researchers investigate how BIM can support sustainable design decisions, energy analysis, building performance evaluation, and facility management throughout the building lifecycle. BIM-enabled sustainability assessment tools and green building certifications are explored as means to promote sustainable construction practices.

2. Literature Review

Firm performance is influenced by a complex interplay of internal and external factors. It explores the multitude of elements that contribute to a company's success or failure and encompasses various dimensions, ranging from internal factors related to management, operations, and strategy to external influences such as market conditions, industry dynamics, religious factors and macroeconomic factors. Understanding, managing, and leveraging these factors strategically is essential for firms seeking to enhance their performance, sustain competitiveness, and achieve long-term success in dynamic business environments.

Religious: Research on the relationship between religious practices and firm performance within the Malaysian construction industry specifically may be somewhat limited, but there are broader studies on religious influences in the workplace and organizational performance that can provide insights. Islamic principles heavily influence business practices in Malaysia, including the construction industry. Islamic teachings emphasize ethical behavior, honesty, and social responsibility (Rafik-Galea & Othman, 2014). Firms that integrate Islamic values into their operations may demonstrate a stronger commitment to ethical conduct

and social responsibility, potentially enhancing their reputation and firm performance. Malaysia is a multicultural and multi-religious society, where religious diversity is prevalent in the workplace, including the construction sector. Research suggests that promoting religious tolerance and accommodating religious practices can contribute to workplace harmony and employee satisfaction (Syed Agil et al., 2014). A harmonious work environment is conducive to productivity and may positively impact firm performance. Islam places importance on ethical leadership and fair decision-making processes. Studies have shown that leadership informed by Islamic principles, such as justice, integrity, and accountability, can positively influence organizational outcomes (Mohamad et al., 2014). In the construction industry, Islamic leadership practices may contribute to effective project management, resource allocation, and stakeholder relations, ultimately impacting firm performance.

Religious practices, such as prayer breaks and religious holidays, are common in Malaysia. Firms that accommodate these practices and create inclusive environments may experience higher levels of employee engagement and well-being (Khan et al., 2017). Engaged and satisfied employees are likely to be more productive and contribute positively to firm performance. Firms need to develop policies and practices that respect religious beliefs while maintaining fairness and equity in the workplace. Religiosity plays an important role in increasing the responsibility and concern of entrepreneurs for environmental welfare (Zaman et al. 2018). Religious beliefs shape entrepreneurial behavior in the practice of implementing social responsibility and achieving higher firm performance. Hassan et al. (2015) revealed religion or belief will affect the firm performance. In contrast, Rosman and Rosli (2013) found the relationship between religiosity and SMEs was negative and only marginally significant. Nonetheless, Zelekha et al. (2014) depicted religious belief as positively and significantly influencing different levels of entrepreneurial activity. Despite the potential benefits, integrating religious practices into the workplace in Malaysia may present challenges related to managing religious diversity and ensuring equal treatment for all employees (Zakaria et al., 2018). Given the overall importance of religiosity in firm activities, a hypothesis can be stated as follows;
H1: There is a positive relationship between religiosity and the firm performance.

Entrepreneurial Competencies: Entrepreneurial competencies significantly influence firm performance by enabling entrepreneurs to identify opportunities, mitigate risks, allocate resources effectively, build strategic partnerships, adapt to changes, inspire their teams, and deliver value to customers. Continuous development and refinement of these competencies are essential for entrepreneurial success in today's competitive business landscape. In 2014, Osman and Rahim undertook an investigation concerning entrepreneurial competencies, focusing on their contribution to entrepreneurial success. Their research offers valuable insights into how entrepreneurial competencies influence the achievement of entrepreneurial goals. By comprehending and nurturing these competencies, potential entrepreneurs can enhance their chances of success in the competitive business landscape of today. In a separate study conducted by Tehseen et al. (2019), an examination was carried out regarding the correlation between entrepreneurial competencies and firm performance. Their findings closely align with the growth and endurance of businesses. Entrepreneurial competencies are pivotal for entrepreneurial triumph and serve as foundational elements in shaping the efficacy and longevity of enterprises.

Scholars emphasize that entrepreneurs with strong competencies in opportunity identification, creativity, and innovation tend to establish ventures that introduce novel products, services, or processes, leading to a competitive edge and enhanced firm performance (Rauch & Hulsink, 2015). Therefore, educational institutions and training providers should focus on developing a comprehensive range of entrepreneurial competencies through experiential learning, practical exercises, case studies, and interaction with industry experts (Mitchelmore & Rowley, 2013). Entrepreneurs who possess higher levels of competencies are more likely to succeed in their ventures. Competent entrepreneurs are better equipped to identify opportunities, overcome challenges, make effective decisions, and build sustainable businesses, ultimately leading to improved performance and outcomes. (Tsai, Chang, & Peng, 2016). In terms of novel concepts, competencies motivate individuals to conceive fresh ideas by facilitating their ability to organize and experiment. In the context of engaging with stakeholders, competencies empower individuals to engage with people from diverse viewpoints (Parida et al., 2017). Hence, possessing the requisite competencies empowers an individual to pose innovative inquiries, present unconventional viewpoints, recognize ambiguous correlations, and devise alternative problem-solving approaches.

The majority of research indicates a favorable correlation between management competencies and firm performance. Empirical evidence from studies conducted by Rauch, Wiklund, Lumpkin, and Frese (2009), Wiklund and Shepherd (2005), Ratten and Usmanij (2019), Morgan, Anokhin, and Wincent (2018), Neneh, and Van Zyl (2018), and Minniti and Levesque (2008) supports this assertion, emphasizing the significance of entrepreneurial competencies in enhancing firm performance across diverse industries and contexts. These studies underscore the importance of entrepreneurial skills such as opportunity recognition, innovation, risk-taking, and strategic planning in driving business success and gaining competitive advantage. Additionally, research by Mamun and Lumpur (2021) further corroborates the positive impact of entrepreneurial competencies on firm performance. This leads to the following hypothesis:
H2: There is a positive relationship between entrepreneurial competencies and firm performance.

Management Practices: Management practices refer to the methods, strategies, procedures, and approaches employed by individuals or teams within an organization to effectively lead, organize, control, and direct resources toward achieving specific goals or objectives. These practices encompass a wide range of activities, including planning, decision-making, organizing tasks and responsibilities, coordinating resources, leading and motivating employees, and controlling processes to ensure that the organization operates efficiently and achieves its intended outcomes. Management practices encompass a wide range of activities and strategies employed by organizations to achieve their goals efficiently and effectively. These practices can include leadership styles, decision-making processes, communication strategies, employee engagement initiatives, performance evaluation systems, and more. The study by Bloom and Van Reenen (2017) is widely cited for its comprehensive analysis of management practices across firms and countries.

The authors developed a methodology for measuring management practices and found a strong positive correlation between management quality and firm performance. Kazuyasu, Tomohiko, and Tsutomu (2023) examined the gross output index as the dependent variable with a significant coefficient of the management practice score. It is found that no significant coefficient is obtained using the value-added index as a dependent variable. However, the investigation unveiled a positive correlation between organizational management practices and firm performance. Tsai, Huang, and Chen (2020) conducted a meta-regression analysis, demonstrating that environmental management practices exhibit a positive association with firm performance. Their research offers a thorough comprehension of the link between environmental management practices and firm performance, effectively addressing potential sources of heterogeneity or disparities in findings across various studies. Therefore, the following hypothesis can be formulated;
H3: There is a positive relationship between management practices and the firm performance.

Innovation: The relationship between innovation and firm performance is a well-researched topic in management and economics. Innovation refers to the process of creating and implementing new ideas, products, processes, or business models that add value to the organization. Firm performance encompasses various indicators of organizational success, including financial metrics, market share, competitiveness, and long-term sustainability. The relation between innovation and firm performance has been widely discussed in the literature. Arora and Gambardella (1990), examine the impact of product innovation strategies on the performance of large firms in the biotechnology industry. It finds that firms that engage in product innovation and establish external linkages with universities and research institutions tend to achieve higher levels of profitability and growth compared to firms that rely solely on internal R&D efforts. Similarly, Jiménez-Jiménez, and Sanz-Valle, (2011) argue that firms that invest in process innovation and foster a learning-oriented culture tend to experience improvements in operational efficiency, cost reduction, and overall financial performance. In addition.

Their study examines the impact of organizational innovation practices (e.g., flexible work arrangements, cross-functional teams, knowledge-sharing platforms) on firm performance in a sample of Spanish firms. It finds that firms that adopt organizational innovation practices are more likely to achieve higher levels of employee satisfaction, productivity, and overall performance. Na and Kang (2019) examined the impacts of process and product innovations on the performance of manufacturing companies in Indonesia, Malaysia, and Vietnam, focusing on select Asian nations. Their findings reveal a positive correlation between product innovation and sales growth. Similarly, research conducted in China by Xu et al. (2019) indicates that innovation has a beneficial effect on the performance of manufacturing enterprises. Additionally, Rosli and Sidek (2013) gathered data

from 284 SMEs operating in Malaysia's food and beverage, textile and apparel, and wood-based subindustries. Their study provides evidence that innovations in both processes and products significantly enhance business performance. Based on the previous studies it can be hypothesized that,
H4: There is a positive relationship between innovation and the firm performance.

3. Research Methods

Sample: The research data was obtained from contractor data registered with the Construction Industry Development Board (CIDB). The study population consists of small construction companies (Grade G1 to G7). Each contractor will be registered by CIDB following the registration grade based on the ability and ability of the contractor to meet the requirements of the contractor registration criteria that have been set. Contractor Registration grade is to determine the limit of the ability to tender or carry out work. There are seven grades for each category. The total population is based on the contractors who have registered in the Public Works Department (PWD) e-Tender (JET). Based on the sampling method, the study has made a total distribution as suggested by Krejcie and Morgan (1970). Google form questionnaire has been distributed through email. After data cleaning was done, a total of 226 questionnaires could be used for the analysis of the study. The sample distribution of the study is shown in Table 1.

Table 1: Sample Distribution by Grade Registration

Grade	Paid-up Capital/Accumulated Capital (RM)*	S	Grade	Paid-up Capital/Accumulated Capital (RM)*	S
G1	5,000/10,000 (SPKK)	42	G5	250,000	28
G2	25,000	20	G6	500,000	18
G3	50,000	18	G7	750,000	70
G4	150,000	30			
Total		**110**	**Total**		**116**

***Sources:** Contractor Registration Procedure Requirements Book, 2015

Table I provides information on the distribution of samples based on grade registration, along with corresponding paid-up capital or accumulated capital in Malaysian Ringgit (RM) and the number of instances denoted by sampling size. In some cases, such classifications might be associated with the size, capacity, or capabilities of contractors, particularly in the construction industry. In summary, the table offers a concise overview of the distribution of samples based on grade registration, including the corresponding paid-up or accumulated capital and the number of instances for each grade in the construction sector:

Measures: The responses for these items were assessed using a five-point scale, with options ranging from "1 – strongly disagree" to "5 – strongly agree." To facilitate interpretation, the total score for each dependent and independent variable measured by the five-point scale items was averaged to create a composite variable. Respondents were tasked with rating firm performance indicators over the past three years using a five-point scale, spanning from "1 – strongly dissatisfactory" to "5 – strongly satisfactory." Four distinct groups of variables were identified for independent variables: religious values, entrepreneur-specific factors, business strategy, and innovation. The measurement of constructs like "Religious," "Entrepreneurial competencies," "Management practices," "Innovation," and "Firm performance" typically involves using multiple items or questions to capture the different dimensions or aspects of each construct. Here's a discussion of how these constructs might be measured based on the number of items specified: Measurement of the construct "Religious" likely involves assessing various aspects of religiosity or religious beliefs, practices, and experiences. These aspects could include frequency of religious attendance, belief in specific religious doctrines, engagement in religious rituals, adherence to religious values, and attitudes toward religious authorities or institutions.

The 15 items may cover a range of questions related to these aspects, such as asking respondents about their religious affiliation, frequency of prayer or meditation, participation in religious services, the importance of religion in their lives, and adherence to religious teachings. Entrepreneurial competencies likely focus on assessing individuals' skills, traits, and abilities relevant to entrepreneurship. It may include dimensions such as creativity, risk-taking propensity, opportunity recognition, leadership, strategic thinking, and resilience. The

12 items encompass questions designed to capture respondents' self-perceived competence or proficiency in various entrepreneurial skills, their past entrepreneurial experiences, their attitudes toward risk and uncertainty, and their ability to identify and capitalize on business opportunities. Management practices" involve assessing the strategies, techniques, and methods employed by organizations or managers to achieve their goals effectively. It may include dimensions such as planning, organizing, directing, controlling, decision-making, and human resource management. The 21 items cover a broad spectrum of managerial practices, including questions about strategic planning processes, performance management systems, employee training and development initiatives, communication strategies, and organizational structure.

Innovation construct focuses on assessing organizations' or individuals' capacity for innovation, including their ability to generate, develop, and implement new ideas, products, processes, or business models. The 11 items include questions related to various aspects of innovation, such as investment in research and development, collaboration with external partners, adoption of new technologies, openness to change, and success in bringing innovative products or services to market. Measurement of "Firm performance" involves assessing the overall effectiveness, efficiency, and success of a business entity in achieving its objectives and delivering value to its stakeholders. The 11 items may cover different dimensions of firm performance, such as financial performance indicators (e.g., profitability, revenue growth), operational metrics (e.g., productivity, efficiency), market-based measures (e.g., market share, customer satisfaction), and strategic outcomes (e.g., competitive advantage, innovation success).

Table 2: Reliability and Collinearity Statistic

Construct	Reliability test		Collinearity statistics	
	Items	Cronbach's α	Tolerance	VIF
Religious	15	0.934	0.508	1.969
Entrepreneurial competencies	12	0.940	0.358	2.790
Management practices	21	0.880	0.369	2.709
Innovation	11	0.922	0.650	1.529
Firm performance	11	0.934		

Source: Based on the sample survey.

Table 2 presents data on the reliability and collinearity statistics for various constructs assessed in the survey. This column enumerates the different constructs or variables evaluated in the survey, encompassing "Religious," "Entrepreneurial competencies," "Management practices," "Innovation," and "Firm performance. The reliability test furnishes insights into the reliability of each construct, gauged through Cronbach's α coefficient. Cronbach's α serves as a metric of internal consistency or reliability for a set of scale or test items, ranging from 0 to 1, with higher values denoting superior reliability. The reliability values specified are 0.934 for Religious, 0.940 for Entrepreneurial competencies, 0.880 for Management practices, and 0.922 for Innovation. As depicted in Table II, Cronbach's α for the examined variables surpassed 0.7, as recommended by Nunnally (1978), indicating their reliability for inclusion in the model.

Moreover, Tolerance and VIF (Variance Inflation Factor) are employed to assess multicollinearity among predictor variables in regression analysis. Tolerance signifies the proportion of variance in a predictor variable that remains unexplained by other predictors.

It ranges from 0 to 1, with values closer to 1 indicating lower collinearity. The tolerance values provided are 0.508 for Religious, 0.358 for Entrepreneurial competencies, 0.369 for Management practices, and 0.650 for Innovation. VIF is the reciprocal of tolerance and measures the extent to which the variance of an estimated regression coefficient is inflated due to multicollinearity. Generally, VIF values above 10 indicate problematic levels of multicollinearity. The VIF values provided are 1.969 for Religious, 2.790 for Entrepreneurial competencies, 2.709 for Management practices, and 1.529 for Innovation. Overall, the table presents information on the reliability of constructs and their collinearity statistics based on the sample survey data. As depicted in Table 2, the variance inflation factor (VIF) results, all below 10 for every variable, and the tolerance values, all exceeding 0.2 for each variable, indicate the absence of multicollinearity.

4. Findings

Table 3 displays the descriptive analysis, encompassing means, standard deviations, and variable correlations. Overall, the mean values for all study variables exceed four, with the practice of religious values variable registering at 4.6690, indicating respondents' inclination towards adhering to high religious values. Standard deviations across all four variables are moderate. Correlation statistics reveal moderate relationships between variables, ranging from 0.281 to 0.723.

Table 3: Descriptive Statistics and Correlation

Variables	Mean	SD	1	2	3	4	5
1. Religious	4.6690	0.4027	1.000				
2. Entrepreneurial competencies	4.3365	0.5138	0.333***	1.000			
3. Management Practices	4.1426	0.4142	0.406***	0.695***	1.000		
4. Innovation	4.2619	0.5438	0.587***	0.570***	0.723***	1.000	
5. Firm performance	4.2116	0.5889	0.281***	0.546***	0.673***	0.584***	1.000

Noted: Significant at: ***p < 0.01, firm performance as the dependent variable.
Source: Based on the sample survey.

The results of the multiple regression analysis are shown in Table 4. The data analysis is divided into three sample categories according to contractor registration grades, namely G1-G4, G5-G7 and overall (based on the amount of paid-up capital). Model 1 does not involve the variable of practicing religious values. The total variance explained for the overall sample is 48.1 percent, $F(3, 222) = 68.681$, $p < 0.01$. The evaluation of the effect of religious value practices on firm performance in the construction sector can be seen more clearly through the change in the explanatory power of the model (R2). In connection with that, in Model 2, the study included the practice variable of religious values simultaneously with three variables related to entrepreneurial-specific factors (personal entrepreneurial competencies, management practices and innovation). Referring to the overall sample in Model 2, the study found that the total variance explaining the firm's performance was 48.6 percent, $F(4, 221) = 52.175$, $p < 0.01$. This explains that the practice variable of religious values does not change significantly, $\Delta R2 = 0.004$, F change $(1, 0.221) = 1.859$, to explain the variation in firm performance in the construction sector. For further analysis, the study refers to Model 2 which involves all variables.

The findings of the study in Table 4 clearly show that the factor of practicing religious values does not have a significant influence on the performance of firms in the construction sector for firms graded G4-G7 and overall. While the sample group for firms in grades G1-G4 ($\beta = -0.222$, $p<0.1$) shows that there is a significant negative relationship between the two variables. This explains that contractors who pay less attention to the practice of religious values show better performance than those who focus on ethics and religious practices in business. Therefore, the study cannot confirm H1. Although the variable of religious values does not have a significant influence on the performance of firms in the construction sector, the study found that there is a significant difference in terms of the practice of religious values between the sample groups (G1-G4 and G5-G7). Through the t-test (Table V), the study found that eight items of religious values practice showed significant differences between the two sample groups of the study, including the items of always keeping promises, not committing fraud, being truthful, honest and sincere. While the other seven items such as being fair when dealing, guarding one's words while dealing, and always being grateful show that there is no difference between the two groups.

Table 4: Result of the Regression Analysis

Variables	Model 1 G1-G4 (*S* = 110)	G5-G7 (*S*=116)	Overall (*S*=226)	Model 2 G1-G34 (*S* = 110)	G5-G7 (*S*=116)	Overall (*S*=226)
Religious Factor				-0.222*	0.060	-0.119
Entrepreneurial specific factor						
Entrepreneurial Competencies	-0.132	0.441***	0.145*	-0.106	0.447***	0.147*
Management practices	0.926***	0.415**	0.642***	0.897***	0.415**	0.636***
Innovation	0.148	0.176	0.201***	0.253**	0.148	0.255***
Constant	0.243	-0.336	-0.036	0.839	-0.519	0.306
R^2	0.465	0.565	0.481	0.480	0.566	0.486
Adjusted R^2	0.450	0.553	0.474	0.460	0.550	0.476
F statistics	30.732***	48.492***	68.681***	24.248***	36.200***	52.175***

Noted: Significant at: *p < 0.10, *p <0.05 and ***p < 0.01, firm performance as dependent variable.
Source: Based on the sample survey.

In Model 2 (refer to Table 4), empirical findings reveal a noteworthy positive correlation between personal entrepreneurial competencies and firm performance within the G5-G7 grade sample group (β= 0.447, p < 0.01), as well as across the entire sample (β= 0.147, p < 0.1), albeit insignificantly so for the G1-G4 grade sample group. Consequently, H2 cannot be conclusively affirmed. Furthermore, the study's analysis demonstrates a significant positive relationship between management practices and firm performance across all sample categories: G1-G4 (β= 0.897, p < 0.01), G5-G7 (β= 0.415, p < 0.05), and overall (β= 0.636, p < 0.01), thus validating H3. This underscores the considerable impact of management practices on determining firm performance within the construction sector. Regarding the innovation variable, the study indicates a positive and significant association with firm performance for the G1-G4 grade sample (β= 0.253, p < 0.05) and overall (β= 0.255, p < 0.01). However, no discernible influence of innovation on firm performance is observed within the G5-G7 grade sample group, leading to only partial confirmation of H6.

Table 5: Level of Religious Beliefs and Practices of Respondents

Items	G1-G4 Mean[a]	SD	G5-G7 Mean[a]	SD	*t-stat*
Always keep promises	4.61	0.526	4.55	0.595	0.769*
No deception	4.54	0.809	4.74	0.577	-2.183***
Genuine, honest and sincere	4.67	0.527	4.76	0.468	-1.293**
Fair trading	4.72	0.452	4.78	0.458	-0.952
Mindful of language	4.69	0.502	4.74	0.478	-0.733
Have a high patience	4.60	0.528	4.66	0.545	-0.773
Emphasis on high work quality	4.69	0.464	4.78	0.458	-1.383**
Grateful for earnings	0.473	0.505	0.472	0.521	0.046
Regularly praying for assistance from Allah	4.82	0.492	4.84	0.409	-0.442
Always take care of praying five times a day	4.76	0.487	4.86	0.393	-1.666***
Many perform circumcision prayers	4.35	0.818	4.66	0.576	-3.275***
Maintaining the practice of fasting in the month of Ramadan	4.75	0.432	4.84	0.409	-1.611***
Often perform circumcision fasting	4.15	0.947	4.26	0.712	-1.012***
Mindful of zakat obligations	4.73	0.540	4.74	0.513	-0.201
High inclination for Hajj and Umrah	4.65	0.566	4.66	0.576	-0.008

Noted: Significant at: *p < 0.10, *p <0.05 and ***p < 0.01: with a five-point scale.
Source: Based on the sample survey.

5. Discussion and Conclusion

This study aims to assess the influence of the practice of religious values and some other factors on the performance of firms in the construction sector. A total of 226 samples from contractors of various registration grades were used. The result from multiple regression analysis shows that the factor of practicing religious values across grade groups G1-G4, G5-G7 and overall does not positively affect the firm's performance. More surprisingly, the study's analysis shows that there is a negative relationship between the practice of religious values and firm performance for the G1-G4 grade sample group. This explains that contractors who do not care about religious practices either in terms of ethics such as guarding their words, always being grateful and having a high level of patience or worship practices that involve the pillars of Islam, show better business performance compared to those who give priority to religious elements the said. Such behavior is not unusual because it often happens when businessmen act outside the norms of religious values such as not keeping promises, committing bribery and fraud to get money for projects, not caring about prayer, fasting and neglecting zakat.

As a result of disobedience to the religious rules, the economic activities carried out are not blessed and subsequently affect business performance. This situation is consistent with what is explained by Kohlberg's Theory, which relates the practices of some parties that are not based on religious rules but rather on experience and rational judgment in making decisions and actions (Rosman & Rosli, 2013; Rohaizat & Suzilawati, 2001; Glover, 1997). The objective of a firm is to maximize profits; therefore, entrepreneurs often practice elements that are contrary to religious rules to achieve this goal. They are also less concerned about fulfilling their responsibilities as servants, especially prayer, fasting and zakat. The Machiavellian principle based on achieving goals without considering the impact on others is always practiced and a priority in their business strategy. The fact is that Islam not only outlines a complete and perfect guide in business affairs but also promises profits and rewards for the supply of the hereafter. However, the attitude of individuals who are more inclined to use sociomoral considerations instead of being guided by religious values and rules in making decisions, is the reason for the failure of economic activities. The research findings show that the entrepreneurial competencies variable for the overall sample and the G5-G7 grade sample group has a significant positive relationship with firm performance.

This finding is consistent with the findings of a study by Pranowa et al. (2020), Zainol and Mamun (2018), and Mamun and Lumpur (2021). This explains the performance of firms in the construction sector depending on entrepreneurial competence such as daring to take risks, being creative and innovative, having high competitiveness and resilience and having a systematic plan owned by the contractor. The higher the entrepreneurial efficiency possessed by the contractor, the better the firm's performance. Empirical evidence from multiple regression analysis clearly shows that the management practice factor is very important in determining the performance of a firm in the construction sector. A significant positive relationship between management practices and firm performance across all three sample groups. In general, three important elements in management practices determine the firm's performance, namely finance, marketing and operations. This finding is consistent with the results of studies conducted by Rosman and Rosli (2013), Tsai et al. (2020), and Parameswar et al. (2021). The analysis of the innovation factor also shows that there is a significant positive relationship between the factor and the firm's performance for the G1-G4 grade sample group and overall. This finding is consistent with the results of studies conducted by Na and Kang (2019), Wadho and Chaudhry (2018), Radicic and Djalilov (2019), Rajapathirana and Hui (2018). The importance of the role of entrepreneurs as the initiator of innovation is consistent with the Theory of Economic Development by Schumpeter (1934).

Comparative analysis shows that small-sized firms (G1-G4) are more innovative than large-scale firms (G5-G7). A group of small-sized firms was found to be more creative in terms of design, quality product production, use of technology, marketing methods and new knowledge such as Building Information Modelling (BIM) in their project management. Emphasis on the innovation aspect is important to increase the competitive advantage and performance of the firm. Referring to the overall sample clearly shows that the three factors related to entrepreneurship are internal resources related to human resources (intangible resources) that have a great influence on the performance of firms in the construction sector. This is consistent with the emphasis of the RBV Theory which relates the resources owned by the firm to being the catalyst for a firm's competitive advantage in the market (Barney, 1991). From a research contribution perspective, this study highlighted to

various parties involved in the construction sector, especially policymakers and industry players the importance of training programs in ensuring sustainable comparative advantage and performance of a firm. Emphasis on the elements of religious values, the formation of entrepreneurial values, business strategies through effective management practices and the generation of innovative and creative values should be given priority in every training program given to contractors. An important basis for the formation of entrepreneurial values, management efficiency and an innovative and creative culture among industry players begins with the practice of religious values thoroughly and not selectively.

Future Studies: This study only investigates the relationship between the practice of religious values and the performance of firms in the construction sector in the context of Islam. A more comprehensive picture, and a comparative analysis between various religions can be done. This study used factors related to four entrepreneurial-specific factors. Therefore, other factors such as elements in human capital (training, business experience and education level, start-up capital, family involvement, Government support and others) can be analyzed to explain the influence on firm performance.

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A Conceptual Framework for the Individual Factors Fostering the Innovative Work Behaviour of STEM Teachers

Siti Rohana Daud, Azira Rahim*, Muhammad Syukri Abdullah, Nani Shuhada Sehat, Saida Farhanah Sarkam, Norlela Abas & Intan Liana Suhaime
Faculty of Business & Management, Melaka Campus, Universiti Teknologi MARA, Malaysia
*azira925@uitm.edu.my

Abstract: This article explores the factors influencing innovative work behavior (IWB) among academics in the field of education, with a specific focus on STEM teachers. The inquiry adopts the conceptual framework of self-determination theory. A literature review methodology is employed, encompassing an examination of journals, conference papers, theses, and a conceptual approach. Variables in this analysis are delineated and measured in accordance with previous research and recommendations. The findings of this study highlight the significance of intrinsic motivation, self-efficacy, and job engagement as pivotal characteristics contributing to the cultivation of innovative work behavior among employees. The study's limitations stem from its reliance on a literature review and the analysis of prior research findings to construct a conceptual framework concerning STEM teachers' innovative work behavior. Future empirical research is recommended to comprehensively elucidate additional factors fostering innovative work behavior. The research findings corroborate earlier studies, suggesting that to bolster Malaysia's standing in the Global Innovation Index (GII) and, indirectly, to advance the goals of the NSTIP 2021-2030 aimed at cultivating a technologically proficient society, educational administrators in Malaysia should actively foster teachers' engagement in innovative work behavior activities, leveraging their competencies and strengths. This study provides valuable insights into the individual factors influencing teachers' propensity for innovative work behavior and their potential to enhance Malaysia's education system.

Keywords: *Innovative Work Behaviour, Individual Factors, Self Determination Theory, STEM Teachers, Teachers, Education.*

1. Introduction

In tandem with technological advancements, Malaysia is intensifying its efforts to remain aligned to adopt the Fourth Industrial Revolution, often referred to as IR 4.0. The National Science, Technology, and Innovation Policy (NSTIP) 2021-2030 has introduced the concept of Science, Technology, Innovation, and Economics (STIE) to highlight the significance of Science, Technology, and Innovation (STI) in driving economic growth and achieving the objective of becoming a high-tech nation. STIE aims to establish and enhance the foundation for innovation and the utilization of science and technology for the benefit of diverse segments of society. Malaysia should transition from being a mere consumer of technology to becoming a nation that actively innovates, creates, and advances technology. Hence, this policy outlines the plan for enhancing the advancement of indigenous technology and fostering a culture of science, technology, and innovation to establish a society proficient in the application of scientific and technological knowledge (NSTIP 2021-2030, mosty.gov.my). Moreover, the advancement of Science, Technology, Engineering, and Mathematics (STEM) necessitates a shift in emphasis and direction to provide education that aligns with the objectives of IR 4.0. Currently, there is significant discourse on the advancements in the domains of STEM, which are closely linked to the concept of IR 4.0.

Therefore, the country's educational system is faced with the challenge of producing human resources equipped with the necessary abilities to successfully adapt to the ongoing shift. Education is widely recognized as a vital element in the development of human talents and attitudes, serving as a primary means of acquiring knowledge (Mohd et al., 2018). Its relevance lies in its capacity to promote the growth of knowledge workers. Hence, scholars play a crucial role in the creation and advancement of innovative knowledge, theories, models, practices, systems, technologies, tools, and approaches (Ibus et al., 2020). These advancements are particularly achieved through innovative work behavior (IWB) (Ibus et al., 2020). Furthermore, education experts have acknowledged the significant influence that various technological advancements in information and communication technology (ICT) have had on education in recent years (Haseeb, 2018). Therefore, it is widely accepted that Education 4.0 will be influenced by these advancements and will require equipping students with

the skills to generate innovations (Mirzajani et al., 2016). Recognizing and addressing the crucial impact of innovation in the context of education is essential, as highlighted by Kundu & Roy (2016). Specific acts of innovation have the potential to generate substantial improvements in the education system.

Within the field of education, innovation has the potential to enhance the learning environment, thereby boosting students' achievement and success. Teachers who introduce innovative approaches can promote creativity in learning, improve the implementation of teaching methods, and facilitate the use of new tools and technology. This can lead to significant benefits for students and the education system as a whole (Zainal & Mohd Matore, 2019). STEM education prioritizes equipping students with the essential skills necessary to address real-world problems. Furthermore, it fosters the development of students' critical thinking abilities, collaborative proficiency, innovative thinking, and effective communication skills (Dare et al., 2021). The urgent need for enhanced STEM education globally can be attributed to the environmental and social challenges of the twenty-first century, which have significant implications for global security and economic stability (Kelley & Knowles, 2016). The active engagement of teachers is crucial in achieving the objectives set by the Ministry of Education (MoE).

Before implementing STEM education, it is essential for teachers, who will serve as mentors, to have a comprehensive understanding of the subject matter (Hasim et al., 2022) and possess the necessary pedagogical skills to effectively impart knowledge. Additionally, teachers should be cognizant of the challenges and difficulties that students may encounter (Abdullah et al., 2015). Parthasarathy & Premalatha (2017) argue that there is insufficient emphasis on research studies examining innovative work behavior within the field of education. Meanwhile, Messmann et al. (2018) observed a scarcity of research on the extent to which teachers engage in innovative work behaviors and how their proactive initiatives might be encouraged and nurtured. This research aims to address a knowledge gap concerning innovative work behavior in educational institutions, focusing particularly on the role of educational institutions, especially STEM teachers, in imparting valuable and practical knowledge to students. Therefore, the objective of this study was to examine the factors influencing the IWB of STEM teachers. This study is expected to provide relevant insights into innovative work behavior, which can assist the government in formulating effective educational reforms for the betterment of its citizens.

Recent Issues: STEM education, derived from the initials of Science, Technology, Engineering, and Mathematics (STEM), encompasses disciplines such as science, mathematics, design and technology, basic computer science, biology, physics, and chemistry (Amelia & Lilia, 2019). STEM Education involves the teaching and learning process, incorporating all aspects of STEM and potentially more (Becker & Park, 2011). STEM education focuses on equipping students with the essential skills needed to tackle practical difficulties encountered in the real world. Furthermore, it fosters the growth of students' critical thinking abilities, collaborative capacity, innovative thinking, and proficient communication skills (Dare et al., 2021). The urgent need for improved STEM education worldwide can be attributed to the environmental and social challenges of the twenty-first century, which have significant consequences for global security and economic stability (Kelley & Knowles, 2016). Rifandi & Rahmi (2019) argue that integrating STEM into education can provide the next generation with the essential skills and knowledge to effectively tackle the challenges of the twenty-first century. In Malaysia, the implementation of a core science and technology policy was initiated in early 1967 to cater to the need for graduates with a science-oriented background (Ong et al., 2021).

As part of this policy, a ratio of 60:40 for Science and Arts was introduced to prioritize the advancement of science and technology (Academy of Science Malaysia, 2017). However, as stated by Thomas & Watters (2015), there has been a decrease or lack of growth in the enthusiasm displayed by students when it comes to pursuing professions in STEM subjects. Caprile et al. (2015) found that there is now an imbalance between the need for workers in STEM sectors and the quantity of students joining the workforce. The scarcity of trained and professional people, as emphasized by Kearney et al. (2015), presents development issues for countries. Additionally, according to data published by the Ministry of Education (MoE) in 2022, there has been a decrease in the percentage of upper secondary students participating in the STEM stream from 2017 to 2022, with a decline from 45.2% to 40.94%. Therefore, this study focuses on the influence of teacher behavior in persuading students to engage in STEM fields. The active involvement of teachers is crucial in attaining the objectives established by the MoE. Before implementing STEM education, it is crucial for teachers, who will act as mentors,

to have a thorough grasp of the subject matter (Hasim et al., 2022) and possess the requisite pedagogical abilities to effectively convey knowledge. Additionally, teachers should be aware of the challenges and hardships that students may face (Abdullah et al., 2015).

2. Methodology

This study involves a literature review that investigates the relationship between individual perspectives and innovative work behavior (IWB). To achieve this purpose, a thorough review of pertinent literature and past research is carried out, gathering information from credible scholarly journals, books, conference proceedings, reports, websites, and numerous commentaries. The following sections offer an overview of relevant studies organized by individual perspectives (intrinsic motivation, self-efficacy, and job engagement) and the correlation between these components and innovative behavior. The research findings are summarised and discussed in the final remarks.

3. Literature Review

This section explores several variables proposed by researchers, including innovative work behavior, intrinsic motivation, self-efficacy, and job engagement.

Innovative Work Behaviour: Innovative work behavior (IWB) refers to an individual's deliberate and purposeful actions aimed at introducing new and advantageous ideas, processes, products, or procedures within a work function, group, or organization (de Jong & Hartog, 2007). According to Scott & Bruce (1994), IWB encompasses a range of actions aimed at identifying, creating, altering, adapting, and executing ideas. Organizations address internal challenges by formulating solutions (Widodo & Mawarto, 2020) and employing non-traditional methods (Ma Prieto & Pérez-Santana, 2014). Employees are encouraged to participate in IWB as a means of fostering creativity in response to the evolving corporate landscape (Hong et al., 2016). A study conducted by Lukes and Stephen (2017) showed that the implementation of IWB has positive effects benefiting both the organization and its employees. These effects include improved working conditions, increased job satisfaction, and enhanced well-being. Innovative work behavior is considered an integral component of IWB, characterized by its dynamic and diversified nature. Within the current professional setting, the adoption of IWB is a crucial determinant for the advancement and progress of organizations, whether they belong to the private or public sectors (Abdullatif et al., 2016). Hakimian et al. (2016) argue that IWB can serve as a competitive advantage for a firm. The presence of IWB in education is essential for propelling operations and improving the quality and outcome of the learning process (Zammit et al., 2023). To fulfill educational goals effectively, teachers and education professionals must exhibit IWB.

This behavior can be influenced by a variety of circumstances (W., & Kusmaryani, 2022). Within the field of education, innovation enables the tailoring of the educational process (Brodhag, 2013), and scholars unanimously agree on the positive impacts of education on communities, families, and individual well-being. Advocating for innovation in education is crucial to optimize the return on public investment. Based on past studies, there are reasons why it is necessary to have teachers with innovative work behavior in schools. To stay updated with the rapid evolution of society, it is crucial to exhibit IWB. The requirements in our knowledge-based society are undeniably escalating for both students and teachers (Klaeijsen et al., 2017). Furthermore, the continuous emergence of new developments and information in the field of education necessitates the adoption of novel teaching practices. This is because teachers, and their instructional approaches in particular, have the most significant influence on students' self-determination and drive to study (Awang-Hashim et al., 2017). Furthermore, schools should serve as a prominent model and serve as a catalyst for fostering more cutting-edge work ethics among individuals, thus ensuring the continued competitiveness of society. Innovation, as stated by Orindah (2014), is a crucial catalyst for both economic and social advancement. Moreover, innovation is considered a method to enhance an organization's ability to adapt to evolving circumstances (Singh & Sarkar, 2012). Education plays a pivotal role in nurturing students' creative and inventive thinking (Usma & Frodden, 2003). In essence, innovative work behavior is vital for the continual advancement of educational professionals, school organizations, and the fostering of a knowledge-based society.

Individual Factors Fostering Innovative Work Behaviour: Individual factors play a crucial role in influencing the innovative work behavior of STEM teachers. These factors can impact the level of motivation, creativity, and propensity to take risks when introducing novel teaching practices and incorporating technology into their classrooms (Zhao et al., 2002). The IWB of STEM teachers is influenced by several individual elements, including intrinsic motivation, self-efficacy beliefs, perceived rewards, perceived challenges, and barriers. Gkontelos (2023) found that crucial individual factors influencing the IWB of STEM teachers encompass self-efficacy, burnout, irrational beliefs, competence, motivation, and organizational commitment. These elements are essential in enhancing teachers' capacity to produce, adapt, and implement novel ideas within the school environment, ultimately resulting in communal advantages (Avsec & Savec, 2021). By comprehending and resolving these specific problems, educational institutions can establish a conducive environment that promotes and sustains teachers' innovative behaviors, thus improving the caliber of education in STEM subjects.

Intrinsic Motivation pertains to the inherent drive and enthusiasm that STEM teachers possess toward their work, which can foster their creativity and inclination to innovate (Stein & Wang, 1988). According to Deci and Ryan (2011), intrinsic motivation refers to the desire that is within an individual that compels them to participate in a specific activity because they find it both challenging and pleasant. Turabik & Baskan (2015) have provided support for the notion that motivation theories can shed light on the factors that drive individuals to perform at a higher level in their jobs. Numerous studies have indicated that people who are motivated by the desire to assist others and the need for personal accomplishment place great value on internal rewards (Dur & Zoutenbier, 2015; Georgellis et al., 2010). It is supported by findings from Shumow & Schmidt (2013) that found the ability to employ scientific knowledge in important decision-making processes is driven by motivation in the scientific field.

Self-efficacy beliefs contribute to the confidence of STEM teachers in their capacity to effectively apply innovative practices, hence impacting their inclination to venture outside their comfort zone and experiment with novel techniques. It pertains to the internal convictions of teachers regarding their capacity to proficiently execute actions that enhance their teaching performance. Prior research by Nemeržitski et al. (2013) has extensively employed it in the educational setting to examine teacher or student behavior. The notion has a substantial impact on the innovative behavior of mathematics teachers (Nemeržitski et al., 2013; Klaeijsen et al., 2018). According to Siregar et al. (2019), self-efficacy pertains to the confidence that teachers have in their capacity to effectively carry out novel tasks. Other than that, self-efficacy is connected to the feelings of workers, which in turn shape their attitudes and beliefs towards their workplaces (Ozer & Akgun, 2015; Warren & Gerler, 2013). In addition, Baharin et al. (2019) and Tims et al. (2014) suggest that self-efficacy can boost an individual's capability and uniqueness, leading to enhanced performance and professionalism. Schunk and DiBenedetto (2016) reported evidence indicating that high self-efficacy can also adversely affect individuals. Individuals with strong self-efficacy may tend to become overconfident and approach tasks with less effort. These diverging viewpoints have made this component a valuable subject of study due to its potential for producing dual impacts.

Additionally, previous research has extensively employed the concept of **job engagement** to examine professionalism and performance in the field of teaching (Hosseini & Haghighi, 2021; Docherty et al., 2018; Ng & Park, 2021). The term can be understood as the personal level of dedication and commitment towards work-related matters. According to the research conducted by Sari et al. (2021), job engagement can be described as the level of motivation and enthusiasm that employees have towards their work. An engaged employee actively participates and endeavors to make valuable contributions to the organization by increasing productivity, efficiency, and fostering innovation. Job Engagement can be separated into three distinct dimensions: energy, dedication, and absorption (Schaufeli, 2006). Energy encompasses a heightened degree of vitality and cognitive stamina in the workplace. Dedication is the state of being fully committed and deeply involved in one's work, resulting in a strong sense of engagement. Feelings of importance, passion, motivation, satisfaction, and difficulties related to one's job. Absorption pertains to employees who have high levels of job satisfaction, derive enjoyment from their work, are fully engaged in their tasks and often perceive time to pass quickly while working. Multiple studies have demonstrated that the level of involvement exhibited by teachers has a substantial impact on their job performance, job satisfaction, and commitment. Additionally, it has been found

to enhance creativity and innovation in teaching approaches, hence influencing teaching performance (Hosseini & Haghighi, 2021).

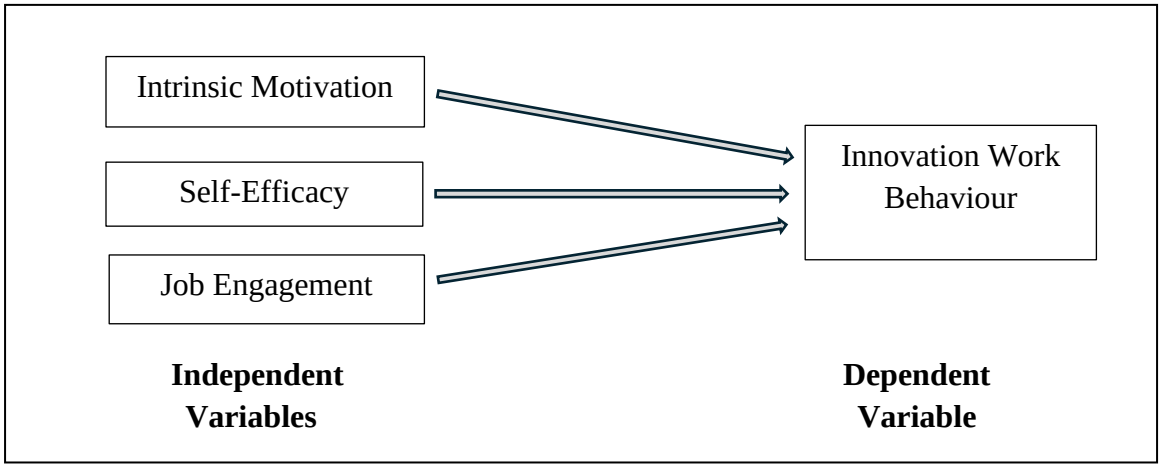
The gap in the Literature: Despite the considerable amount of research dedicated to identifying the antecedent factors that may impact STEM teachers' IWB, there remains a literature gap regarding variables and innovative work behavior due to industry differences (Zainal & Lata, 2021), fragmented and inconsistent findings (Bos-nehles, 2017), and the necessity to reexamine several variables associated with innovative work behavior (Namono et al., 2021). In Malaysia, other significant stakeholders in the education system, including administrators and instructors, are excluded from the narrow focus. Given the concerning performance of Malaysia on the Global Innovation Index (GII), there is an imperative need for, and emphasis should be placed on research about IWB in Malaysia. Aside from that, innovations will shape Education 4.0, and teachers will need to be prepared to construct creative learning environments that support student creativity (Johari et al., 2021). Furthermore, innovations can fill the void discovered by Caprile et al. (2015) between the number of students entering the workforce and the demand for workers in the STEM sector.

Underpinning Theory: A theory has been applied to the factors that underpin IWB based on the study. This theory has been employed in this investigation. Consequently, the purpose of this study is to evaluate the proposed theoretical framework by utilizing this theory.

Self-Determination Theory: The origins of self-determination theory can be traced back to the research conducted by psychologists Edward Deci and Richard Ryan. They initially presented their concepts in their 1985 publication titled "Self-Determination and Intrinsic Motivation in Human Behaviour." They formulated a motivation theory positing that individuals are primarily motivated by a desire for personal growth and fulfillment. The theory of self-determination has been extended to several domains, encompassing education, employment, child-rearing, physical activity, and well-being. Studies indicate that possessing a strong sense of self-determination can promote achievement in all aspects of one's life (Cherry, 2022). The primary focus of self-determination theory lies on internal sources of motivation, specifically the desire to acquire knowledge or attain independence. Furthermore, cultivating a cohesive sense of self necessitates the presence of employees who possess job satisfaction and derive pleasure from executing duties and embracing novel challenges and experiences. Therefore, Self-Determination Theory can and has been utilized to explain how individual factors foster employees' innovative work behavior.

Proposed Research Framework

Figure 1: Conceptual Framework



This study establishes a research framework as a foundation for the study's objective. The study's conceptual framework encompasses three independent variables, namely intrinsic motivation, self-efficacy, and job engagement, with innovative work behavior serving as the dependent variable. The independent variables and dependent variables exhibit a direct correlation within the model. The study will adopt the Self-Determination

Theory as its conceptual framework. Figure 1 presents a visual representation of the conceptual framework, showcasing the independent and dependent variables of the study at hand. The independent variables in this study include intrinsic motivation, self-efficacy, and job engagement, while the dependent variable is innovative work behavior. Moreover, the arrows signify that the present study seeks to evaluate the degree to which the preceding elements impact innovative work behavior. Several studies have investigated IWB as an outcome variable, although there remains a significant amount of research to be conducted on different aspects of this idea.

4. Discussion

The findings of this study, derived from a comprehensive evaluation of the relevant literature, indicate numerous elements that have the potential to influence the IWB of STEM teachers, either directly or indirectly. Intrinsically motivated employees tend to be more creative because this type of motivation enhances their curiosity, cognitive flexibility, and willingness to take risks, all of which are conducive to generating creative ideas (Deci & Ryan, 1985; Grant & Berry, 2011; Rego et al., 2012). This finding is supported by Kong et al. (2017), who identified that employees possessing intrinsic motivation are more likely to approach their work with diligence and embrace novel approaches that foster innovation and creativity. In addition, intrinsic motivators are associated with the work itself (Saeed et al., 2019), enabling teachers to focus better on tasks and strive for excellence in all their endeavors, including being more creative and innovative. This aligns with the findings of studies by Anzarwati (2021), Bawuro et al. (2019), and Arasli & Alphun (2019), collectively establishing that IWB is significantly and positively influenced by intrinsic motivation. However, intrinsic motivation also plays an intermediate role between leadership and innovative work behavior, as it boosts the creativity of employees (Kaur & Rahmadani, 2023).

This suggests that intrinsic motivation is one of the elements that can trigger IWB among teachers in schools. Although intrinsic motivation has been found to play a significant role in various elements of employee performance, it does not seem to be an effective component in driving innovative behaviors on its own (Karadeniz et al., 2021). If teachers are intrinsically motivated in the way they carry out their work, then it can be argued that they are more innovative. In their study, Klaeijsen et al. (2018) discovered a positive correlation between teachers' innovative behavior and their levels of intrinsic motivation and self-efficacy. Motivation and self-efficacy are recognized as key elements that influence employees' IWB (Siregar et al., 2019), and just as self-efficacy has a direct positive impact on teachers' IWB (Susanti & Ardi, 2022; Gkontelos et al., 2023; Li et al., 2024). Bandura suggested that self-efficacy affects individual performance, which is thought to affect an individual's behavior, particularly in terms of effort, resilience in facing challenges (Thurlings et al., 2015), and openness to change (Shamsudin & Majid, 2018). However, studies have discovered that the connection between self-efficacy and innovative work behavior is influenced by other factors.

A favorable school climate may enhance the impact of self-efficacy on a teacher's innovative behavior, as indicated by factors like school climate (Kundu & Roy, 2023). Thus, considering the impact of self-efficacy on IWB is crucial since it plays a significant role in shaping teachers' behavior within the innovation process. While Li et al. (2024) found that facilitating conditions, self-efficacy, and job engagement have significant direct effects on elementary mathematics teachers' IWB. Findings by Kaur and Rahmadani (2023) also confirm that job engagement directly affects IWB. Additionally, job engagement mediates the relationship between job crafting and innovative work behavior (Bhattarai & Budhathoki, 2023). Job engagement also mediates the relationship between organizational identification and innovative work behavior (Charli et al., 2023) and moderates the relationship between job crafting and IWB, with higher levels of job engagement leading to increased innovative behavior (Lee & Park, 2023). However, research findings by Sari et al. (2021) suggest that job engagement does not play a prominent role in shaping employees' IWB. Nevertheless, these findings contradict the research findings that self-efficacy and employee engagement mediate the relationship between the learning support environment and innovative work behavior (Bhattarai & Budhathoki, 2023).

5. Conclusion

In summary, the findings of this study highlight the significance of intrinsic motivation, self-efficacy, and job engagement as critical factors contributing to the development of innovative work behavior among employees.

These factors have the potential to empower teachers, particularly those in STEM fields, to adapt to technological advancements and environmental changes, thereby indirectly fostering creative thinking among their students. By recognizing the relevance of self-efficacy, intrinsic motivation, and job engagement to teachers' innovative behavior, this study offers valuable insights into the educational system. It is envisaged that these findings will aid school administrators in continually supporting teachers to enhance their creativity and innovation in their work, particularly in delivering knowledge to students. This, in turn, may spark students' interest in exploring the STEM field, thus bridging the gap between the demand for STEM sector employment and the growth of employment prospects in high-tech skills-based economic and industrial sectors, which align with the nation's progress in automation and technological advancements (Astro Awani, 2023). Moreover, it is hoped that this study will inspire further research, particularly regarding STEM education in Malaysia.

Additionally, it is anticipated that this research will provide insights into the determinants of innovative behavior among educators, especially teachers, offering stakeholders guidance on efforts to enhance such behavior. In the current landscape of education and educational reform, where progress is rapid, the development of innovative conduct among teachers is imperative for the continued relevance of education in achieving its objectives. Future research endeavors should aim to explore deeper into this topic, examining the extent to which the factors identified in this study exert influence. To contribute to the body of knowledge and understand whether these variables act directly, as mediators, or as moderators of innovative behavior among educators, comprehensive research is necessary. Additionally, further empirical evidence is needed to explore the impact of various motivational factors on teachers' innovative work behavior. Such research would be instrumental in guiding future studies on teachers' innovative behavior, benefiting all stakeholders involved in the educational process.

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Unveiling the Nexus Between Intellectual Capital Efficiency and Financial Performance in Malaysia's Healthcare Sector Amidst the Covid-19 Crisis

Noor Sharida Badri Shah*[1&2] & Roslan Ja'afar[1]
[1]Graduate School of Business, Universiti Kebangsaan Malaysia, Bangi, Selangor, Malaysia
[2]Faculty of Business and Management, Universiti Teknologi Mara, Perlis Branch Arau, Perlis, Malaysia
*sharidabadrishah@yahoo.com, sharida699@gmail.com, jroslan@ukm.edu.my

Abstract: Intellectual capital is a vital element in strategic resources and enhances the productivity of companies in the knowledge-based economy. However, during the COVID-19 pandemic, most of the sectors in Malaysia are affected by staff and apply knowledge-based processes and procedures. The study aims to assess the influence of intellectual capital (IC) efficiency on financial performance in Malaysia's healthcare system during the COVID-19 pandemic. The VAIC technique was used in the study, as well as panel data analysis with STATA 14. The sample was drawn from three (3) years of healthcare annual reports, spanning 2019 to 2021. Eleven (11) healthcare companies were chosen because they have the capacity to develop public healthcare services and provide high-quality medical facilities. The findings for VAIC ranking show Hartalega, the main producer of disposable gloves marked as the highest ranking of efficiency and the least efficient is TMC Life. For panel data analysis, the results exhibit value-added human capital (VAHU) and value-added capital employed (VACA) are observed to have a significant and positive relationship with the dependent variable; Return on Equity (ROE). Human capital and capital employed are considered the most efficient resources to generate profit and the vital elements in the Malaysian healthcare sector to combat the COVID-19 pandemic. This study contributed to the body of knowledge in the Malaysian healthcare sector about intellectual capital literature. Malaysian healthcare organizations can benefit from incorporating more intellectual capital into their operations to preserve long-term development progress.

Keywords: *Intellectual capital, Malaysian healthcare sector, Covid-19 pandemic.*

1. Introduction

In today's knowledge-based economy, intellectual capital has been identified as an essential component for increasing productivity and maintaining organizational performance. The knowledge-based economy requires more information technology, skills, and knowledge from employees than tangible assets. The shift from an industrial to a knowledge-based economy represents how value is created within an organization. Intellectual capital assets are the intangible assets that contribute to a firm's bottom line. According to empirical data, intangibles are critical to fostering corporate performance. This indicates that strategic resources must be available regardless of a company's asset portfolio size (Denicolai et al., 2015). As a result, strategic management of these intangible assets is an important focus of our research. As a result, organizations that grasp the concept of intellectual capital are more likely to thrive because they realize its significance and continually update their knowledge and skills to compete with others (Huffman, 2012). The global healthcare industry is one of the most active and rapidly expanding sectors of the global economy. People's increased awareness of health has propelled the health business to become a major engine of economic growth.

Healthcare is a wealth generator, and national healthcare costs are rising dramatically. Aside from organic expansion in services, pharmaceuticals, and medical equipment, the healthcare sector explored new boundaries in services, clinical research, health tourism, and generic pharmaceutical manufacturing. According to the International Trade Administration (2022), Malaysia's healthcare expenditures are expected to increase to $28 billion by 2028. The government has allocated $7.7 billion to the Ministry of Health for operations and development expenses to prioritize public healthcare in preparation for COVID-19's endemic phase. The healthcare sector has grown in importance since it has a large potential for sustainable growth and as a platform for medical tourism hubs. The novel's emergence as a global epidemic has generated the need for environmental, health, and economic. In March 2020, the World Health Organization (WHO) declared COVID-19 a pandemic. Wang, Horby, and Hayden (2020) characterize the COVID-19 outbreak as a public health threat with serious health, environmental, and economic consequences. The World Health Organization received the first confirmed case of the novel coronavirus, which was initially diagnosed as 'pneumonia with unknown etiology'.

The pandemic started in a seafood market in Wuhan, China, and spread rapidly across countries through human-to-human transmission and community expansion (Sarkodie and Owusu, 2020). In the history of COVID-19, the United States has been identified as having the highest number of confirmed cases (938, 154) and deaths (53,755) across 183 countries, followed by Spain (223,759 confirmed cases and 22,902 deaths) and Italy (195, 351 confirmed cases and 26,384 deaths) (Lauren, 2020). According to Ahir et al. (2020), the coronavirus has caused more global anxiety and pandemic uncertainty than SARS (2002), Avian flu (2003), Swine flu (2009), or Ebola (2014). Several interventions are implemented during the period to control the spread of COVID-19 (Gautam and Hens, 2020). This includes quarantine, travel bans, restrictions, social distance enforcement, public place closures, and public event cancellations. The COVID-19 pandemic has had a substantial and varied influence on the global healthcare sector. COVID-19 caused an unusual rise in demand for healthcare services, particularly in areas extensively impacted by the virus. Hospitals and healthcare facilities struggled to manage the patient influx, resulting in overcrowded emergency rooms and shortages of beds, equipment, and medical personnel. Healthcare systems around the world encountered financial issues as a result of increased spending on COVID-19 response activities, lost revenue from cancelled procedures, and lower patient volumes for non-COVID treatment.

Many hospitals and healthcare facilities battled to stay financially viable, resulting in layoffs, furloughs, and closures in some circumstances. Containment efforts were implemented to prevent the health consequences of the global pandemic, which impacted the sustainability of the environment and economic development. Overall, this disease has impacted global markets, and it will be considered an unprecedented event affect that forced many businesses to shut down their operations. Corporations were forced, and continue to be compelled in certain ways, to operate without the ability to use their physical assets to drive firm performance. As a result, despite a debilitating economic situation, they rely on leveraging their intellectual capital at an unseen level to continue fueling business success. The outbreak has been a new experience for Malaysia, particularly with the implementation of a large-scale public health and social measure known as the Movement Control Order (MCO). Malaysia's healthcare system is separated into two areas: public health and medicine. Malaysians experienced strong emotions at the onset of the outbreak, with much uncertainty about the pandemic's outcome as the world witnessed dangerously high COVID-19 mortality. Furthermore, Malaysia has concluded the second wave of diseases. The lessons learned thus far have helped the country's healthcare system become more vigilant and prepared for future pandemics. To meet the demand for COVID-19 screening, more healthcare personnel are involved in COVID-19 patient care, more laboratory services are used, and efficient clinical management is necessary (Amaran, Kamaruzaman, Esa, & Sulaiman, 2021).

Apparently, the healthcare sector utilizes in-house resources for their business operations as the intellectual capital elements (procedures, systems, processes, knowledge, experiences, and expertise) are the performance indicators for the healthcare sector. A need to analyze the IC efficiency in the Malaysian healthcare sector during the pandemic because more expenditure is forced to be made and the sector should use all available resources to survive the increase in COVID-19 cases. The situation deteriorated as the healthcare industry confronted a scarcity of healthcare personnel (nurses and doctors). The healthcare sector as well as the government can cut costs and increase profits by utilizing the IC component, especially in the face of an unusual catastrophe. As a result, the purpose of this research is to examine the impact of IC efficiency on financial performance in the Malaysian healthcare industry during the COVID-19 pandemic, as they are facing severe circumstances and need to survive to keep a competitive advantage. The novelty of this study is that it evaluates and analyzes IC efficiency performance on the financial performance of the Malaysian healthcare sector during a crisis period or unprecedented event. In fact, the study demonstrated the beauty of the VAIC approach, which is regarded as the greatest instrument for evaluating IC performance and is beneficial as well as critical to investors and corporate firms in making decisions. Moreover, it also determines the strength of IC resources for their organizations to maintain competitive advantages as well as for sustainable development and growth in the healthcare sector.

Value Added as an Indicator of IC (the VAIC method): The VAICTM method enables the organization to evaluate the effectiveness of its value generation (Pulic 2001, 2002). The VAICTM approach used a company's financial statements to compute the efficiency coefficient for three types of capital: human capital, structural capital, and capital employed. Although VAICTM employs accounting data, it is unconcerned about the firm's costs. According to Pulic (2000), VAIC focuses on resource efficiency, which adds value to the firm. Pulic (1998)

introduced the Value-Added Intellectual Coefficient (VAIC) as an indirect measure of the effectiveness of corporate Intellectual Capital value addition. VAIC has been identified as a significant component of financial capital (monetary and physical), human capital, and structural capital. Since VAIC is calculated as the sum of capital employed efficiency human capital efficiency and structural capital efficiency, a higher number for VAIC indicates greater efficiency in the use of company capital. According to Pulic (2001), a firm's market value is formed by capital employed (physical and financial) and intellectual capital assets that can be used to generate value for a company. According to Basyar (2012), some of the main reasons for using VAIC are: 1) VAIC is derived from audited data, so the results are more objective and verifiable; 2) VAIC provides a consistent and standardized measure; and 3) VAIC is an analytical procedure that allows for the evaluation and monitoring of value-added efficiency with total resources and each major resource category.

2. Literature Review

Intellectual Capital: Many scholars from all around the world have studied intellectual capital in a variety of contexts. According to Guthrie et al. (2012), intellectual capital is evolving and growing in terms of both the number of articles published and scholars investigating it. Critical IC research is also growing, which results in a better knowledge of how IC operates (Dumay and Garanina, 2013). Intellectual capital (IC) is described as knowledge that is used to generate profit and provide value to businesses (Harrison & Sullivan, 2000). The majority of studies (Chen et al. 2005; Clarke et al. 2011; Nadeem et al. 2019) found that IC helps companies perform better. However, opinions differ on how it affects corporate performance during an economic slump. Morariu (2014) observed that the relationship between IC and profitability deteriorated during the 2008 financial crisis. According to Nadeem et al. (2019), the IC of companies remains constant during the financial crisis, assisting businesses in weathering the economic downturn. Kehelwalatenna (2016), on the other hand, found that IC improved productivity during the 2008 economic collapse. The contradictions of the IC study during the crisis have resulted in differing points of view. Today, intellectual capital is a valued resource in business, garnering the attention of executives, investors, and legislators (Edvinsson & Malone, 1997). Low and Kalafut (2002) defined intellectual capital (IC) as an intangible asset that contributes to a company's competitive advantage and includes specific technology, customer knowledge, brand name, reputation, and corporate culture.

Bontis et al. (2000) conducted the first empirical study on intellectual capital performance in Malaysia. They concentrated on the interaction of intellectual capital in Malaysia's service and non-service industries. Furthermore, Goh (2005) investigated IC performance. Between 2001 and 2002, Goh (2005) sought to assess the IC performance of ten (10) domestic and six (6) international commercial banks. According to the study, human capital efficiency (HC) accounts for almost 80% of the value creation capability (VAIC in value) of both domestic and foreign banks, as opposed to structural capital efficiency (SC) and capital employed efficiency (CEE). Based on the previous studies, this indicates that IC performance is a vital element in strategic resources of corporate firms to generate profit and create value added. With respect to the IC perspective, the resource-based view (RBV) is the main theory to explain the development of intellectual capital (IC). The RBV of the firm focuses on the inside, which includes its resources and capabilities, to explain the organization's profit and worth (Penrose, 1980). This hypothesis is defined by Hoopes et al. (2003) as disparities in performance within an industry. This occurs when successful organizations have significant resources that others do not (Wernerfelt, 1984). The RBV also serves as a strategic line of thought for the organization, analyzing its strengths and limitations.

Value Added Intellectual Capital (VAIC): VAIC is an important part of intellectual capital since it indicates the company's ability to generate value added (VA). According to Pulic (1998), VA is the most objective way to assess a company's success and potential for value creation. In this case, Maditinos et al. (2011) stated that the greater the value of intellectual capital (VAIC), the more efficient the utilization of corporate capital is, resulting in VA for the company. Pitelli Britto, Monetti, and da Rocha Lima Jr. (2014) studied whether IC elements or standard accounting efficiency criteria may better assess value generation in Brazilian real estate firms. Except for capital utilization efficiency, they identified an inverse correlation between IC and market value, implying that firms with higher values demonstrated lower levels of IC. The difference between income and expense is the value added in this scenario.

The VAIC model assesses IC by measuring three (3) components: capital employed efficiency (VACA), human capital efficiency (VAHU), and structural capital efficiency (STVA). Human capital is based on numerous types of knowledge, including skills, experience, training, and expertise. This is consistent with the premise that existing knowledge leads to organizational excellence. Structural capital refers to the processes and procedures that are created by and stored in a firm's technology system that speed the flow of knowledge through the organization (Youndt, Subramaniam, & Snell 2004). Moreover, VACA is a physical and financial asset that contributes to the efficiency of the firm and generates profit. As a result, the larger the value of VAIC, the better the potential utilization of firm value development.

Intellectual Capital and Financial Performance: The majority of the researchers firmly believed that IC had a favorable impact on the financial performance of the company (Chen et al, 2005; Ozkan, Cakan, and Kayacan, 2017; Smriti et al. 2018). This is defined as profitability with the assumption that invested capital can earn a specific level of profit. According to Chen et al. (2005), if IC is a useful resource for a company's competitive edge, it will contribute to the company's financial performance. IC is critical to increasing the value of a firm or its financial performance. Companies that can efficiently use their IC can boost their company's market worth. Furthermore, Riahi and Belkaoiu (2003) documented that IC is highly associated with multinational company performance in the United States, lending support to the resource-based theory and stakeholder theory. Furthermore, Pasaribu, Purnamasari, and Hapsari (2012) discovered an effect of VAIC on financial performance as a proxy for return on equity (ROE), earning per share (EPS), asset turnover (ATO), price to equity ratio (PER), and growth rate (GR) using a sample of manufacturing companies listed on the Indonesian stock exchange from 2006 to 2008. In addition to ROA, additional proxies can be used to reflect financial performance to examine the relationship between intellectual capital and corporate performance.

These research findings are also consistent with theories (resources-based theory), which describe how valuable resources in an organization contribute to the company's competitive advantage as well as superior financial performance. Human capital refers to the human part of an organization, such as a combination of talents, qualifications, and knowledge that gives each character (Bontis, Dragonetti, Jacobsen, and Roos, 1999). Human capital efficiency is critical for Malaysia's competitiveness and economic performance. It decides how much the country can leverage its workforce's skills and knowledge to promote productivity, innovation, and inclusive growth. From the perspective of the healthcare sector, organizations can improve the quality of care they deliver by incorporating value-added human capital, such as competent healthcare personnel. Improved care quality may result in better patient outcomes, enhanced patient satisfaction, and, ultimately, better financial performance due to factors such as higher patient retention rates and favorable word-of-mouth referrals. Sarwar (2014) supports this, finding that the quality of patient treatment is the most important element in patient satisfaction in Malaysian private healthcare. The findings revealed that patient satisfaction resulted a good financial performance as the healthcare staff were efficient in their service.

Well-trained and motivated healthcare professionals can help improve efficiency and productivity in healthcare facilities. This can lead to cost savings, less waste, and more efficient resource utilization, all of which can improve financial performance. Zula (2007) believed that if management focused more on human capital efficiency, it would reduce admission and waiting time in hospitals, increase budgeting, reduce costs, and enhance hospital performance. Another study done by Rahim, Kamaluddin, and Atan (2018) revealed that human capital efficiency has a significant and positive relationship with financial performance (ROE). Capital employed is the total amount of funds invested in a business, including equity and long-term debt, which are used to generate profits. Another definition given by Izzo, Tomnyuk, and Lombardo (2022), capital employed is the amount of capital to generate profits, which can improve company performance. In the healthcare sector, it can be considered an investment in hospital buildings, medical equipment, and technology infrastructure. A well-equipped healthcare facility can attract patients and healthcare professionals, which can positively impact financial performance. Many studies have proven that capital-employed efficiency has a significant and positive relationship with financial performance. Smriti and Das (2018), Chen et al. (2005) and Tiwari (2022) found that capital employed has a significant effect on financial performance. Effective management of capital resources is critical for long-term financial success in the healthcare industry.

Intellectual Capital and Healthcare Sector: Healthcare organizations have a distinct business model that distinguishes them from other industries. The expertise, skills, and experiences of the workforce are the most

valuable assets for a healthcare organization. Based on Evans, Brown, and Baker (2015), intangible resources derived from internal and external constitute intellectual capital in healthcare facilities and companies. Covell and Sidani (2012), on the other hand, revealed that IC can be defined as a repository of physicians' and nurses' expertise within an organization. Furthermore, much of IC in healthcare organizations focuses on measuring rather than controlling (Kim and Chung, 2012). According to Veltri, Bronzetti, and Sicoli (2011), little research has been conducted on how to systematically manage IC and what techniques can be employed to harness IC inside and across the healthcare industry. In another study done by Habersam and Piber (2003), IC is well-recognized in hospitals, and its measurement and treatment are crucial. The labor of highly trained and talented personnel caring for patients in need of specialized healthcare is reflected in HC within hospitals (Mohamedi and Ghorbanhosseini, 2015). Doctors and nurses are referred to as registered experts in theory and practice based on academic education, participation in continuing professional development activities, specialty training, and work experience (Mohamedi & Ghorbanhosseini 2015). Organizational process efficiency, databases, information, and manufacturing technologies are all examples of structural capital (Cohen & Kaimenakis 2007). This IC component is also known as HC's embodiment, empowerment, and enabling infrastructure (Bontis 1998). SC refers to the structural capital or resources in hospitals that include medical and nursing information, practice guidelines, and protocols that are used to help clinicians apply their knowledge and expertise in patient care. Consequently, further research is imperative, particularly within the Malaysian context, to identify strategies managers can utilize to enhance, implement, refine, and leverage intellectual capital within healthcare organizations.

Methodology: With respect to panel data analysis, the dependent variable in this study is the return on equity (ROE), which refers to the return to shareholders of common shares and is commonly used as a financial indicator for investors. In addition, the independent variables of the study are VAHU, STVA, and VACA. The three (3) IC parameters; VAHU, STVA, and VACA will be regressed simultaneously to see which parameters led to efficiency and profitability for the firm during the COVID-19 pandemic. The following are the measurements for each parameter:

Table 1: Measurement and Variables

Dependent Variable (Financial performance)	**Measurement**
ROE (Return on Equity)	Net profit/ total equity (Chen et. al, 2005; Xu et al, 2017; Xu and Wang, 2019)
Independent Variable (IC Parameters)	
VAIC (Value Added Intellectual Coefficient)	VAIN + VACA (Zeghal and Maaloul, 2010)
VAHU (Value Added Human Capital)	VA/HC (Zeghal and Maaloul, 2010)
STVA (Value Added Structural capital)	SC/VA (Zeghal and Maaloul, 2010)
VACA (Value Added Capital Employed)	VA/CA (Chen et. Al, 2005; Zeghal and Maaloul, 2010)
VAIN (Value Added Intellectual capital)	VAHU + STVA (Zeghal and Maaloul, 2010)

3. Research Methodology

Data Collection and Sample Selection: To examine the influence of IC on financial performance in the Malaysian healthcare sector, data were acquired from the annual reports of eleven (11) healthcare firms named Kotra, Hartalega, Supermax, Kossan Rubber, Top Glove, DuoPharma, Apex, Pharmaniaga, Adventa, KPJ Bhd, and TMC Life. The companies have been chosen as samples due to their consistency in generating profits during the COVID-19 pandemic as well as the availability of the data. Data was collected from 2019 to 2021 to evaluate the efficiency of IC during the COVID-19 pandemic, as it happened within the year. The Malaysian healthcare sector was chosen as an example since it was the most significant and afflicted sector during the COVID-19 outbreak.

VAIC Method: According to Zeghal and Maaloul (2010), the VAIC method presents several steps to perform VA from all the IC resources. The first step is to calculate the company's ability to create VA. Based on stakeholder theory (Riahi-Belkaoui, 2003), the VA is calculated as follows:

VA = OUTPUT - INPUT (1)

Where Outputs (OUT) represent income and include all items and services offered in the market; inputs (IN) include all expenses for running a business, excluding staff costs, which are not considered costs. The next step is to identify the relationship between VA and HC. The value-added human capital coefficient (VAHU) calculates how much value one financial unit invests in its people. Pulic (2004) regards employee costs as an indicator of HC. These costs are no longer included in the inputs. This suggests that personnel expenses are seen as an investment rather than a cost. As a result, the relationship between VA and HC reveals HC's potential to produce value in a company:

VAHU = VA/HC (2)

The third stage is to investigate the connection between VA and SC. The structural capital value-added coefficient (STVA) measures the contribution of SC to value generation. According to Pulic (2004), SC is obtained by subtracting HC from VA. SC is a dependent indicator on the generated VA and is proportional to HC. As a result, the higher the HC in the produced VA, the lower the share of SC. As a result, the relationship between Value Added (VA) and Structural capital (SC) is determined as follows:

STVA = SC/VA (3)

The fourth step is to calculate the value-added intellectual capital coefficient (VAIN), which demonstrates the role of IC in value creation. The VAIN is calculated by adding the VAHU and STVA:

VAIN = VAHU + STVA (4)

The fifth stage is to determine the relationship between VA and both physical and financial capital employed (CA). IC cannot generate value on its own, according to Pulic (2004). As a result, it is critical to consider both financial and physical capital to gain a complete picture of the VA generated by a company's resources. The value-added capital employed coefficient (VACA) calculates the additional value generated by one monetary unit invested in capital employed. As a result, the relationship between VA and CA illustrates the ability of capital to produce value in a company:

VACA = VA/CA (5)

The sixth phase involves assessing each resource that contributes to the establishment or production of VA. As a result, VAIC determines how much new value is created per monetary unit spent on each resource. A high coefficient indicates that a company's resources, particularly its IC, are being exploited to generate additional value. As a result, the VAIC is computed as follows:

VAIC = VAIN + VACA (6)

Panel Data Analysis: To determine the presence of the most efficient factor, the study employs two (2) methodologies, including the VAIC method and panel data analysis with the statistical program STATA 14. As a result, the research employed descriptive statistics, correlation analysis, diagnostic test panel specification test; fixed effect model and random effect model using static panel data model.

4. Results and Discussion

Value Added Intellectual Coefficient (VAIC) Method

Table 2: Value Added Intellectual Coefficient (VAIC) Method – VAIC Ranking

Company	VAIC
HARTALEGA	77.167
SUPERMAX	10.545
KOSSAN RUBBER	5.308
TOP GLOVE	3.925
DUOPHARMA	3.44
APEX	3.419
PHARMANIAGA	3.178
ADVENTA	2.509
KPJ	1.975

KOTRA	0.016
TMC LIFE	-0.759

Malaysian healthcare companies can be ranked from highest to lowest in terms of value-added intellectual coefficient (VAIC). The highest VAIC represents the company's highest level of efficiency in using all components of intellectual capital, including human capital, structural capital, and capital employed. Thus, VAIC depicts the contribution of all enterprises in investing RM1 in intangible assets. Table 2 shows the value-added Intellectual Coefficient (VAIC) ranking for Malaysian publicly listed companies in the healthcare sector from 2019 until 2021. Based on the table and the VAIC ranking, it shows Hartalega is at the top of the list with a VAIC of 77.167, followed by Supermax, which indicates 10.545. It implies that Hartalega contributed RM 77.167 million from intellectual capital efficiency (human capital, structural capital, and capital employed) for every RM 1 value invested in an organization. As a result, Hartalega was recognized as the most efficient company in utilizing its intangible assets to create profit during the COVID-19 epidemic. Supermax came in second position for VAIC, which indicates that for every RM1 spent in an organization, RM10.545 million was earned from intellectual capital. In addition, Kossan Rubber also ranks third in the VAIC ranking of Malaysian healthcare companies, which shows 5.308. It means for every RM 1 value invested in an organization, RM 5.308 million is created from the intellectual capital component.

It demonstrated that the companies (Hartalega, Supermax, and Kossan Rubber) are successful healthcare enterprises in using all of their resources and generating profits while surviving the COVID-19 outbreak because they are the largest makers of disposable gloves in Malaysia. During the pandemic, all Malaysian healthcare facilities will require gloves. TMC Life has the lowest VAIC grade of -0.759, indicating that it is the least efficient in using intellectual capital compared to other companies in the healthcare industry. For every RM1 invested in an organization, TMC Life created RM-0.759 million in intellectual capital. Aside from that, the sixth (6) firms (Kotra, KPJ, Adventa, Pharmaniaga, Top Glove, and Apex) are investing in intellectual capital, which generates between RM 0.016 million and RM 3.9 million for every RM 1 invested. To summarize, the majority of Malaysian healthcare companies use all IC resources to produce profit. During the pandemic, all healthcare companies are fighting for survival to increase profits. Hartalega is the most efficient healthcare company, whereas TMC Life is the least efficient. Different company characteristics and operations have led to the success of the business in confronting difficult times. However, the findings also found that profits gained during COVID-19 in Malaysian healthcare companies were significantly lower than before the epidemic. This suggests that Malaysian healthcare companies are severely impacted by the pandemic.

Descriptive Statistic

Table 3: Descriptive Statistic

	ROE	VAHU	STVA	VACA
Mean	0.113	113.39	0.365	0.229
Standard deviation	0.179	272.55	0.721	0.264
Min	-0.152	0.42	-1.365	0.016
Max	0.8	1022.36	0.999	1.265
Variance	0.032	74282.75	0.520	0.0696
Skewness	2.156	2.573	-1.002	2.188
Kurtosis	8.326	8.158	2.692	8.469
Obs	33	33	33	33

Table 3 exhibited the descriptive statistics in terms of the independent variables (intellectual capital parameters), VAHU, STVA, VACA, and the dependent variable; return on equity (ROE). Based on the table above, the highest mean score is VAHU (113.39), followed by STVA (0.365). The Malaysian healthcare sector had the lowest mean VACA score of 0.229, ranging from 0.016 to 1.265. The dependent variable of ROE shows 0.113, ranging from -0.152 to 0.8. With the 33 observations, the Malaysian healthcare sector exhibited the highest

VAHU mean score, indicating that expertise, skills, and experiences have been recognized as strategic resources in the changing competitive climate nowadays.

Correlation Analysis: Before conducting regression analysis, the study performed correlation analysis. Correlation analysis is useful in identifying the strength and direction of a relationship between two continuous variables. The correlation analysis for Malaysia's healthcare industry is as follows:

Table 4: Correlation Analysis

	ROE	VAHU	STVA	VACA
ROE	1			
VAHU	-0.0745	1		
STVA	0.2344	0.3724*	1	
VACA	0.8417*	-0.1725	0.3575*	1

Table 4 exhibits the correlation analysis between intellectual capital parameters; VAHU, STVA and VACA and financial performance (ROE) for Malaysian healthcare sectors. Intellectual capital (IC) parameter; VACA was found to have a strong positive and significant correlation with ROE which indicates 0.8417. In contrast, VAHU was found to have a negative relationship with ROE (-0.0745). Similar results of weak positive correlation were found between IC parameter STVA and ROE in the healthcare sector. Based on correlation analysis, VACA (value added capital employed) has a strong relationship with ROE (return on equity) which is significant at the 0.10 level of confidence.

Panel Data Analysis

Panel Specification Tests: In this study, the following is the result of the Hausman test; the decision to choose the Fixed Effect or Random Effect model was used to analyze the data as proposed and explained by Park (2011).

Table 5: Panel Specification Test

Hausman		Appropriate Model
chibar2	p-value	
2.84	41.74	Random effect (RE)

Table 5 addresses the panel specification test and the Hausman test for all IC components (VAHU, STVA, and VACA). The chart also explained the Hausman test, which is critical when deciding between the Fixed Effect and Random Effect models. According to the results, the p-values for all IC components are greater than 0.05. As a result, Ho is accepted, and the best-suited model is the random Effect (FE) model. Based on the overall test, the results indicate that the random Effect model is the best model estimator for intellectual capital (VAHU, STVA, and VACA) and financial performance in Malaysia's healthcare industry.

Diagnostic Tests: Linear Regression: Based on diagnostic tests, the study has conducted three (3) tests which are the multicollinearity test (Variance inflation factors), Heteroskedasticity (Modified Wald Test) and Serial Correlation test (Autocorrelation).

Table 6: Diagnostic Test for Static Model

	P-Values of the Tests		
VIF	H	SC	Strategy
1.37	-	0.0828	Random Effect GLS regression with robust option

Table 6 shows the calculated values of variance inflation factors (VIFs) that are less than 10. It indicates that multicollinearity does not appear to be a significant issue in this investigation. In fact, the serial correlation test (autocorrelation) with the Wooldridge test reveals that all IC components have p-values greater than 0.05. It indicates that there is no serial correlation problem in this study. Since the study used a random effect model, the error is considered heteroskedastic. Following Hoechle's (2007) recommendation, the corrective operation was carried out using random effects GLS regression with a robust option. According to the diagnostic tests, the study shows no multicollinearity or serial correlation issues. The solution is based on random effect GLS.

Regression Analysis: Equation:

$$ROEit = -0.0229 + 0.0001VAHU - 0.0233\text{STVA} + 0.5723\text{VACA} + \varepsilon \quad (1)$$

Where; ROE = return on equity, VAHU= value added human capital, STVA= value added structural capital, VACA= Value Added Capital employed, ε = error

Table 7: Regression Analysis

	(1)	(2)	(3)	(4)
VAHU	0.0001	0.0001	0.0001	0.0001**
	(1.23)	(1.42)	(1.23)	(2.45)
STVA	-0.0361	-0.0233	-0.0361	-0.0233
	(-1.23)	(-0.45)	(-1.23)	(-0.29)
VACA	0.6252***	0.5723***	0.6252***	0.5723***
	(8.27)	(6.55)	(8.27)	(5.78)
Constant	-0.0272	-0.0229	-0.0272	-0.0229
	(-1.09)	(-0.73)	(-1.09)	(-0.75)
N	33.0000	33.0000	33.0000	33.0000
r2	0.7278	0.6942		0.6942
r2_a	0.6996	0.4850		0.6626
r2_w		0.6942	0.6882	0.6942
r2_b		0.7738	0.8128	0.7738
r2_o		0.7207	0.7278	0.7207
F	25.8442	14.3773		12.1233
p	0.0000	0.0000	0.0000	0.0011
chi2			77.5325	

Dependent variable: Return on Equity (ROE)
**t* statistics in parentheses
Notes: (1) ROE=Return on Equity, VACA=Capital employed, VAHU=Human Capital, STVA = structural capital. (2) Figures in parenthesis are t-statistic.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 7 displays the results of regression for the Malaysian healthcare sector (financial performance) using all IC components (VAHU, STVA, and VACA) from Equation 1. Given the different diagnostic tests performed and the corrective processes implemented, it is possible to infer that the analyzed statistical test satisfies the key assumptions of linear regressions. According to the table in Model 4, the independent variables VAHU and VACA have a substantial impact on ROE. The independent variable of value-added human capital (VAHU) has a substantial positive relationship with ROE ($\beta = 0.0001$, $p<0.05$, t-value = 2.45). This indicates that healthcare companies and facilities urgently need more skilled workers, human expertise, and experience to handle the critical situation during the COVID-19 pandemic as the number of cases kept increasing day to day within the period (2019-2021). This is supported by Zigan (2007) and Van Beveren (2003), who argue that healthcare facilities, such as hospitals, must employ and coordinate specialized knowledge, skills, and talents entrenched in their personnel to provide quality treatment to patients. A strong unity among the front-liners (healthcare staff) is urgently required to combat the pandemic while also providing the best quality of service to protect Malaysians from infection. Zula (2007) believed that focusing on human capital efficiency would reduce admission times, hospital wait times, and expenditures, and increase the company's financial performance.

The independent variable of value-added capital employed (VACA) ($\beta= 0.5723$, $p<0.01$, t-value=5.78) shows a positive and significant connection with ROE. This indicates that Malaysian healthcare companies are efficient in utilizing financial and physical assets to support their operations during the COVID-19 pandemic. This is supported by Chen et al. (2005), who found a positive and significant relationship between capital employed and ROE. Apparently, during the pandemic, Malaysian healthcare sectors urgently need capital employed (including government, individual and NGO financial assistance) to cover the cost related to COVID-19 assessment (high technology appliances for COVID-19 test assessment and Intensive Care Unit), materials related to avoiding infection, such as PPE, masks and other healthcare expenditures. In addition, Malaysian healthcare companies are fully utilized and rely more on human capital and capital-employed resources to generate profits and sustain competitive advantage. Surprisingly, STVA (value-added structural capital) is not significant with ROE. This implies that during the pandemic, healthcare companies particularly hospitals and other healthcare facilities put more emphasis on human expertise, skills and collective knowledge from the staff to function rather than focus on structural capital. The empirical models for the healthcare industry explain a significant portion of the variance in ROE, with R-square (overall) values of 0.7207. Independent variables VAHU, STVA, and VACA explain 72.07% of the dependent variables (ROE). The remaining 27.93% will be explained by additional variables not included in this study.

5. Conclusion and Recommendations

Intellectual capital efficiency is increasingly being recognized as a critical component of strategic resources for long-term business competitive advantage. This study provides empirical evidence for healthcare company management to learn that firms with higher intellectual capital efficiency have higher profitability and revenue growth in both current and future years. Even when companies face unusual events such as the COVID-19 epidemic, they can still make profits by utilizing IC resources. The more efficiently IC resources are used, the more profit is generated. Furthermore, investors can place a higher value on organizations with higher intellectual capital efficiency, while also understanding the invisible value of intellectual capital. Healthcare organizations can use IC efficiency resources to become more relevant as medical tourism centers. With the expanding need for innovation, research, and development to improve treatment quality, lower costs, and integrate services, more effective ways for managing and measuring IC are needed both within and within healthcare organizations.

To be more competitive for sustainable development growth, Future studies can add value to the study by comparing pre and post-pandemic financial performance and IC efficiency, as well as incorporating research and development (R&D) characteristics, especially during the crisis time. Because the study only collected data for three (3) years, a longer study period could be used in the future. Using data from Malaysian healthcare companies, our findings have crucial and major consequences for the Malaysian healthcare sector in terms of designing the best strategy and combating other diseases more effectively. The study's findings can help Malaysian investors, politicians, and healthcare companies better understand the influence of intellectual capital on the healthcare sector. There are numerous ramifications for investment decisions, particularly in the intellectual capital components: human capital, structural capital, and capital used.

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Microcredit Clients' Financial Literacy Towards Financial Inclusion and Sustainability

Azlina Rahim, Vani Tanggamani*, Hamidah Bani & Nor Ashikin Alias
Faculty of Accountancy, Universiti Teknologi MARA, Cawangan Melaka, Kampus Alor Gajah, Alor Gajah, Melaka, Malaysia
*vani@uitm.edu.my

Abstract: According to the recent Malaysian MADANI Budget 2023 which has been declared by Prime Minister Datuk Seri Anwar Ibrahim, it is notable that 7 billion was allocated to help micro-entrepreneurs, women and youth. Therefore, it is crucial to ensure that the clients have appropriate financial literacy to ensure that the loans can be repaid accordingly. For microcredit clients to have this ability, they should have sound financial literacy to be able to manage their money, make wise decisions, and maintain vigorous spending. Thus, to promote sustainable financial sustainability, the objective of this study is to assess the level of microcredit financial literacy of microcredit clients in enhancing their knowledge, skills and transparency that can lead to financial sustainability. Further, it will also test empirically whether microcredit financial literacy can integrate the cognitive comprehension of financial knowledge, skills and responsibility with respect to financial sustainability. This study will use an exploratory sequential mixed-method research design that combines quantitative (questionnaires) and qualitative (interviews) data. The data-gathering method then continues with concentrated group interviews on selected microcredit clients. This covers clients from TEKUN Nasional Melaka to deliberate on related problems. Data analysis in qualitative research focuses on the systematic search and arrangement of interview transcripts. Interviews are necessary to gain a thorough understanding of issues with financial knowledge and skills among clients. It is expected that the study will benefit the policy maker, microcredit clients and the government in enhancing financial inclusion and sustainability. Thus, the government's slogan "Developing Malaysia MADANI" can be achieved.

Keywords: *Microcredit Clients, Financial Literacy, Financial Inclusion, Sustainability, TEKUN.*

1. Introduction

Microcredit has been defined as the provision of a small amount of loans to those living below the poverty line in developing countries (Sayankar & Mali, 2022). According to the Microfinance Barometer 2018, microfinance institutions worldwide serve 139 million consumers or borrowers. This shows that around 7 percent of the entire population is still living in poverty. Thus, microcredit is widely recognized as an important development strategy for poverty reduction, household welfare improvement, and women's empowerment, with the primary beneficiaries being poor households who are unable to obtain a loan from banks due to a lack of physical collateral credit. According to the recent budget 2023 which has been declared by Prime Minister Datuk Seri Anwar Ibrahim, it is notable that 7 billion was allocated to help micro-entrepreneurs, women and youth. Therefore, it is crucial to ensure that the recipients have appropriate financial literacy to ensure that the loans can be repaid accordingly. A study conducted by the Credit Counselling and Debt Management Agency (AKPK) indicated that one out of every three Malaysians consider themselves to have a low level of confidence in financial management. This is because low levels of financial literacy will result in poor financial investment and bad decisions. Thus, it is essential to accelerate personal financial literacy in Malaysia.

Based on the National Strategy for Financial Literacy 2019-2023, one of the key objectives of Malaysia's Strategic Priorities and Action Plans is to advise, educate, and support Malaysians in practicing healthy financial management, with an emphasis on disadvantaged groups of society. This comprises of developing healthy money management approaches through community-based financial education and instilling positive behaviors toward financial resilience and sustainability. The low level of financial literacy, particularly among microcredit clients, has undoubtedly led to some types of poor financial investing and decision-making due to their incapability to clearly identify and select an investing option that meets their risk tolerance. As a result, it will have a substantial impact on both personal finances and the overall financial system. As a result, both developed and developing countries should prioritize increasing personal financial knowledge and orientation. Therefore, financial literacy has become one of the significant elements in the twenty-first century. To have this ability microcredit clients should have sound financial literacy to be capable of managing their finances, making wise decisions, and maintaining a healthy spending pattern. Thus, to promote sustainable financial stability,

microcredit financial literacy is important as a vital indicator to enhance and promote financial awareness, particularly among microcredit clients in Malaysia.

Research Questions
(i) Why microcredit financial literacy is vital for microcredit clients?
(ii) How can microcredit financial literacy help microcredit clients for sustainability?

Objective (s) of the Research
(i) To assess the level of microcredit financial literacy of microcredit clients in enhancing their knowledge, skills and transparency that can lead towards financial sustainability.
(ii) To test empirically whether microcredit financial literacy can integrate the cognitive comprehension of financial knowledge, skills and responsibility with respect to financial sustainability.

2. Literature Review

Development of Microcredit in Malaysia: Over the last four decades, Bangladesh's Muhammad Yunus conducted an experiment to assist underprivileged women by providing them with a small loan to expand their bamboo business, which resulted in the establishment of Grameen Bank (Ahmad Nazrie and Kumar, 2019). The effort caused millions of disadvantaged people to seek financial aid, resulting in a higher quality of living and poverty reduction (Ledgerwood, Earne, & Nelson, 2013). Many poor nations have emulated Grameen Bank's strategy, resulting in the formation of microfinance organizations. One of the countries that adopted this model is Malaysia. In Malaysia, microfinance is defined as small business loans of up to RM 50,000 with a maximum loan tenure of seven years (Shu-Teng, Mohd Ashhari, Suraya Hanim, and Nassir, 2015). Malaysia has three major microfinance institutions including Amanah Ikhtiar Malaysia (AIM), National Entrepreneur Group Economic Fund (TEKUN) and Yayasan Usaha Maju (Yamamoto, Ota, Akiya, & Shintani, 2017). The third microfinance institution, TEKUN which has been established with the major goal is to give rapid and easy loan service to Bumiputra and Indian entrepreneurs. Microfinance is the provision of financial services to low-income persons who are often overlooked by traditional financial institutions. Microfinance is internationally recognized and accredited for its role in poverty alleviation, as proven by the many countries that adopt it.

Microfinance is the practice of providing financial services to people with low or no income, such as loans and savings, on a micro or tiny scale. A microfinance loan goes through several stages or events from the time it is granted until it is repaid. The National Microfinance Policy 2017 would establish an enabling environment for the creation of appropriate and creative microfinance products and services to fulfill the real demands of the low-income population while boosting economic growth and speeding up poverty reduction. Microfinancing refers to small business loans of up to RM50,000 for microenterprises and self-employed persons. Microfinance is intended solely for business funding, such as working capital and capital expenditure. This is not a personal loan. According to the research, microenterprise growth is determined by a variety of factors. In many situations, micro and small businesses were founded in response to the owners' needs and preferences, and as a result, many of these businesses are less organized, less structured, and more individualized. Aside from that, the majority of these microentrepreneurs are at a disadvantage because they lack sufficient education and experience (Mokhtar & Ashhari, 2015). As a result, the effect of microfinance institutions on financial literacy in Malaysia has not been fully researched. The gap must be filled by looking at how the microfinance institutions' operations affect and promote financial literacy, especially among microcredit clients.

Definition and Characteristics of Financial Literacy: Financial literacy refers to the understanding, information, competence, attitude, and behavior needed to make sound financial decisions and, ultimately, attain individual financial well-being (Organization for Economic Cooperation and Development). Another definition provided by the President's Advisory Council on Financial Literacy is the capacity to employ knowledge and skills to effectively manage financial resources over one's lifetime (Pailella, 2016). Financial literacy is a term widely used to describe financial education and knowledge. It is a wide concept that necessitates the translation of ideas and knowledge for wealth development through efficient savings and investment. Ajibola, Saheed, and Adedoyin (2020) define financial literacy as knowledge and skills. More specifically, the concept of financial literacy today necessitates individual financial behavior, preferences, and self-control to make better financial investment decisions. According to the Organisation for Economic

Cooperation and Development (OECD), financial literacy encompasses not only knowledge and understanding of financial concepts and risks, but also the skills, motivation, and confidence to apply such knowledge and understanding to make effective decisions in a variety of financial contexts, improve individuals' and society's financial well-being, and enable participation in economic life. Thus, financial literacy refers to both knowledge and financial behavior.

In light of the quick changes and constant advancements in the financial sector and the larger economy, it is critical to assess if people are prepared to successfully direct the confusion of financial decisions that they encounter daily. There is strong evidence that financial literacy affects people's financial decisions and behaviors. Financial literacy, for example, has been linked to changes in saving and investment practices, as well as debt management and borrowing patterns. Empirically, financially intelligent people are more likely to accumulate money (Lusardi and Mitchell, 2014). There are various arguments for why increased financial literacy leads to greater wealth. Financial literacy has also been associated with higher investment returns and investing in more complex assets, such as stocks, which frequently provide higher returns. Ultimately, financial literacy influences everything from daily to long-term financial conclusions, with ramifications for both individuals and society. Low levels of financial literacy across countries are associated with successful spending and financial planning, as well as costly borrowing and debt management (Lusardi, 2019). It has also been noticed that financial literacy can help people make more informed decisions, which leads to healthy financial behavior. As a result, one might argue that increased financial knowledge promotes prudent economic behavior.

Financial Inclusion and Sustainability: Financial inclusion is one of the most crucial issues for inclusive growth and economic development in the current environment. The term "financial inclusion" initially appeared in British parlance when it was revealed that approximately 7.5 million people lacked a bank account. An inclusive financial system is essential for strong and resilient households, communities, and economies. In this context, financial inclusion policies must support meaningful access and effective use of low-cost financial products and services, allowing consumers to save, invest, protect against risks, and develop financial buffers for current and future needs. To accomplish this, having the skills and information for making sound financial decisions is critical. This will establish the groundwork for individuals and businesses to enhance their financial health and resilience while stimulating the economy and promoting socioeconomic growth. (The Financial Inclusion Framework, 2023). As a result, future financial inclusion efforts will need to account for these new realities to produce meaningful outcomes that will improve people's financial well-being in this country. According to Sayankar and Mali (2022), apart from their socio-economic status, other reasons keep them away from the formal banking system. Among the reasons for financial inclusion are sufficient resources of economic facilities in rural areas, more involvement of informal sources like moneylenders, high operating cost of servicing to poor people which has to be borne by these financial institutions, no assets to be pledged for raising finance, low level of literacy especially financial literacy and lack of technology knowledge. Financial sustainability is a hotly debated topic, particularly between the two methods, namely the welfare and institutionalist views.

The Welfarist theory asserts that the number of impoverished individuals helped by microfinance institutions is a measure of their performance. This hypothesis is based on the premise that setting up microfinance institutions reduces poverty by empowering the poorest among the economically active poor (Marwa & Aziakpono, 2015). Contrary, according to Institutionalist ideology, microfinance institutions must establish long-term intermediation. MFIs must be sustainable to provide better financial services and help eliminate poverty (Mitra, 2017). Another study in the area of sustainability was conducted by Maeenuddin et al. (2023) where they studied the predictors of microfinance sustainability. The findings indicate that loan size, number of borrowers, percentage of female borrowers, and inflation all have a favorable impact on FSI. Organizational structure, liquidity, leverage, cost per borrower, and GDP have a major negative impact on the financial sustainability of the microfinance business in Bangladesh. Out of all the abovementioned reasons, the most critical reason is the lack of financial literacy amongst the economically active poor class of society. This becomes a huge barrier to achieving full financial inclusion. The second most critical issue is the lack of knowledge of technology. To achieve financial inclusion, there should be enough amount of financial literacy. Therefore, microcredit plays a very vital role to achieve financial inclusion. Financial inclusion and financial literacy are vital for achieving financial sustainability (Rastogi and Kumar, 2021; Singh and Tandon, 2012). A

solid foundation of financial literacy can contribute to sustainability by supporting diverse life goals such as saving for school or retirement, managing debt responsibly, and running a business.

3. Research Methodology

This study focuses on Microcredit clients in Melaka. This sample is selected because TEKUN National which is an agency under the Ministry of Entrepreneurial and Cooperative Development provides business capital financing for micro-entrepreneurs. Therefore, it is crucial to ensure that the clients have appropriate financial literacy to ensure that the loans can be repaid accordingly. The main objective of this study is to assess the level of financial literacy among microcredit clients by emphasizing the following variables or elements: (i) demographic traits, (ii) financial knowledge and comprehension, (iii) financial skills and competence, and (iv) financial responsibility. These four characteristics are predicted to influence microcredit consumers' financial literacy. Demographic factors include age, gender, and background. Tertiary and higher-level education, as well as related experience, can all contribute to financial knowledge and awareness. Attendance at relevant training and workshops contributes to financial competence. Financial responsibility includes attitudes, social influence, emotions, and financial obstacles.

Furthermore, each of these characteristics will be used to improve client responsibility and transparency. This study will use an experimental sequential mixed-method research design with both qualitative (interviews) and quantitative (questionnaires) data. Data analysis in qualitative research focuses on the systematic search and arrangement of interview transcripts. Interviews are vital for gaining a thorough grasp of clients' financial knowledge and skills. The interviews will be recorded and transcribed using theme analysis to determine what is now practiced against what is expected. Following completion of this process, the research activities will resume with data analysis. The supplied data will be evaluated with SEM AMOS. The data acquired can be utilized to establish if microcredit financial literacy can integrate a cognitive understanding of financial knowledge, skills, and responsibility in relation to financial sustainability. The results will then be examined and their consequences, as well as suggestions for improvement. Finally, this study concluded and made recommendations for microcredit financial literacy based on research findings.

4. Contribution of the Study

This study will make theoretical and practical contributions to the topic of financial literacy in Malaysia. Firstly, the proposed microcredit financial literacy model can enhance the people's skills and abilities which can lead towards financial inclusion and sustainability. This study will emphasize theoretical contribution to increase financial knowledge, skills, and responsibility for meeting current and ongoing financial commitments to make sound financial decisions. Secondly, the proposed model of microcredit financial literacy will help the government include appropriate initiatives for increasing growth through financial initiatives that focus on financial policies and programs. Finally, the industry also plays an important role since the proposed model of microcredit financial literacy will help to deliver suggestions and action plans that would boost Malaysia's long-term competitiveness.

5. Conclusion

This study focuses on the microcredit financial literacy of microcredit clients in enhancing their knowledge, skills and transparency that can lead towards financial sustainability. The knowledge and skills are very important since individuals with financial literacy can handle their finances more effectively. This involves budgeting, savings, investing, and debt management. Individuals who lack these skills may suffer from financial stability, including debt accumulation, insufficient savings, and trouble accomplishing financial goals. Apart from that, by having good financial literacy, microcredit clients will be able to make sound financial decisions. Overall, financial literacy is important because it allows people to take control of their finances, make educated decisions, avoid financial traps, plan for the future, contribute to economic stability, and fight to reduce wealth disparity. As a result, financial literacy has emerged as a critical component of the twenty-first-century economy. Microcredit clients must have strong financial literacy to manage their resources, make sensible decisions, and maintain healthy spending habits. Thus, to maintain long-term financial stability, microcredit financial literacy is critical as a key indicator for raising and promoting financial awareness, particularly among

microcredit consumers in Malaysia.

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Elevating Financial Literacy Among Women Entrepreneurs: Cognitive Approach of Strong Financial Knowledge, Financial Skills and Financial Responsibility

Vani Tanggamani, Azlina Rahim*, Hamidah Bani & Nor Ashikin Alias
Faculty of Accountancy, Universiti Teknologi MARA, Cawangan Melaka, Kampus Alor Gajah, Alor Gajah, Melaka, Malaysia
*azlina@uitm.edu.my

Abstract: A notable challenge for Malaysian women entrepreneurs is the lack of adequate financial literacy, which leads to a major setback in their business growth. According to the National Strategy for Financial Literacy 2019 – 2024, the significant objective of Malaysia's Strategic Plans, is to educate women entrepreneurs in engaging in good financial management systems, by actively focusing on vulnerable parts of society. This comprises nurturing money management knowledge and skills via community-based and instilling encouraging behavior toward financial plans. However, it was discovered that women entrepreneurs have poor financial knowledge and a narrow-minded "just live for today" mindset when it comes to financial planning. The FOMCA fully supports Bank Negara Malaysia's anxious, absence of financial knowledge in the year 2022-2023. Failure to hold the values of appropriate financial management systems is a key problem for community development. Thus, the purpose of this study is to raise financial literacy among Malaysian women entrepreneurs to encourage accountable behavior and rational thinking to improve financial knowledge, financial skills and financial responsibility. Women entrepreneurs play a vital role in creating a sustainable, viable and wealthy community. In sum, it may decrease poverty among those in the category of B40 community. Thus, this study is extremely referred to in the cognitive approach of strong financial knowledge, financial skills and financial responsibility of the group to be considered, giving importance to the development of the community economic activities and program. This study adopts the theory of resource-based view and uses a mixed-method design that combines the quantitative research methods of questionnaires and qualitative research method of semistructured in-depth interviews to improve the level of financial literacy that is anticipated to advance financially literate women entrepreneurs for sustainable economic wellbeing. The outcome of this study is expected to alleviate women entrepreneurs' economic well-being since there is no specific benchmark of financial literacy for women-based entrepreneurship currently. Integrating the standpoints of women entrepreneurs is recognized as the mission of the Ministry of Women, Family, and Community Development to increase the number of participants and raise the status of women entrepreneurs in this country as well as towards "Developing Malaysia MADANI", support the principles of Shared Prosperity Vision and the mission of SDG2030.

Keywords: *Strong Financial Literacy, Women Entrepreneur, Financial Knowledge, Financial Responsibility, Financial Skills*

1. Introduction

Recovering from the pandemic-induced economic shock, the Malaysian economy has carried a wide-ranging new situation that causes women entrepreneurs to suffer in managing their finances and causing them vastly susceptible to the effect of a financial shock (Malaysia-Financial Literacy Month, 2023). Even though women entrepreneurs have turned out to be significant players in the business landscape, research has revealed that women hardly engage in business due to lower levels of financial skills and knowledge to manage business. Their financial literacy level is still low and notably women entrepreneurs are at higher risk of having financial problems. Hence, they are living below the poverty line and struggling to survive on government financial assistance to survive in their business. Indeed, numerous government agencies such as the State Economic Development Corporation (SEDC), Ministry for Women, Family and Community Development, Ministry of Rural and Regional Development, Department of Community Development (KEMAS) and Department of Agriculture (DOA) have given several provision and funding including financial assistance to assist Malaysian women entrepreneurs. Moreover, government initiatives in the Madani Economy Framework and also in the 2024 Budget will play a vital role in addressing this concerning issue.

Notably, those in the lower levels of financial knowledge face an even more significant challenge which centers on financial literacy gaps, a scarcity mindset, and intense business pressures (Indriaswari, 2022). A huge

amount of funding has been spent on government activities every year. Concerning women entrepreneurs, the Malaysian government continues to spend a huge amount of distribution on women's entrepreneurship activities. However, many women entrepreneurs are not managing their money optimally (Malaysia Department of Insolvency, 2023). The recent 2023 Economic Survey conducted by OECD indicated that women have poor levels of financial knowledge and behavior in financial planning. This is due to a lack of financial literacy in conducting financial matters. Undoubtedly, the ultimate guide of financial literacy is a key success of economic empowerment. However, to achieve effective execution of policies and envisioned outcomes, a strong financial literacy among women is a paramount necessity (Boisclair, Lusardi, & Michaud, 2017), particularly among entrepreneurs.

Problem Statement: Women entrepreneurs' financial literacy has developed a universal research need, and previous literature offers mixed findings on financial literacy among women entrepreneurs across the world. However, it was discovered that despite its necessity, there is still a paucity of literature on the subject (Lyons & Kass, 2021), particularly financial literacy studies for women entrepreneurs (Younas & Rafay, 2021) and its impact on their well-being, more specifically, their economic well-being. Hence, well-being can be described as the integration of three basic dimensions which are: material dimension, relational dimension and subjective dimension. The economics of well-being is encompassed in the material dimension of well-being which must also be emphasized in this era where major global issues such as debilitating poverty, increasing incidence of inequality, and environmental destruction and degradation are still happening (Fan, 2023). The result has been that of economic uncertainty in the nation (Ghazali et al., 2022).

Given this environment, obtaining financial literacy is a must in today's economic growth to ensure continued financial stability (Odetayo et al., 2020). Indeed, the COVID-19 post-pandemic makes people tend to tolerate high risks and obligations in their financial decision-making process. This problem is for society as a whole. It is the right timing to energetically expand financial literacy education across all parts of society needs an organized, sustained, and synchronized approach that focuses on producing long-term social change (Engels, Kamlesh & Philip, 2020; Boisclair, Lusardi, & Michaud, 2017). National Strategy for Financial Literacy 2019-2024 (National Strategy) recognizes the important priorities for attaining this and assists in aligning synergies across initiatives towards enriching the financial well-being of all Malaysian women entrepreneurs. Learning fundamental monetary principles and mastering the possible trade-offs between risks and returns are vital life skills that are essential to be stressed (Artavanis & Kara, 2020). Despite its necessity to enhance entrepreneurial behavior among individuals, it was discovered that there is still a paucity of literature on the subject (Lyons & Kass, 2021), particularly in Malaysia's financial literacy studies (Ghazali et al., 2022).

The discussion of financial consciousness, knowledge, attitude, skill and rational behavior is comparatively none. Hence, to embrace the principles of good financial administration, especially in driving toward the economic recovery phase of 2024, this study proposed a financial literacy model as an essential tool to enhance economic empowerment and financial well-being of women entrepreneurs in Malaysia. Nevertheless, the significance of financial literacy is not mainly stressed by women entrepreneurs for the performance of economic development in Malaysia (Rashid et al., 2019), although financial literacy is a crucial segment towards influencing a person's ability to control finances efficiently (Rashid et al., 2019). A strong foundation of financial literacy will allow the person to control available financial resources competently and efficiently in a technique that will raise the capability of the government to deliver added services to society (Mohamed, 2017). Well, our government expects to enhance Malaysia's financial health and donate to the development of the economy. Indeed, RM3.52 billion was allocated to the Ministry of Women, Family and Community Development (KPWKM) under Budget 2024.

Funding could be utilized to ensure that women entrepreneurs realize that managing their finances is critically important. It is their responsibility to master plan expenses, investments and monitoring funds that lead towards a wealthy society. Therefore, there is a gap in theoretical perspective related to the lack of knowledge of financial issues among women entrepreneurs, thus leading to trouble in their business success and expansion (Lyons & Kass, 2021). Current empirical literature, however, has not extensively investigated the association between financial literacy and women's entrepreneurship development towards economic well-being. Literature reviews related to financial literacy, especially among Malaysian women entrepreneurs are still required. Gaining knowledge about financial literacy will positively affect their monetary accountability

and financial attitude, which is expected to advantage them in making sound decisions and judgments concerning monetary matters. In conclusion, will benefit women entrepreneurs as well as the nation as a whole. Therefore, this study aims to uplift the level of financial literacy among women entrepreneurs, particularly in their cognitive approach to financial knowledge, financial responsibility and financial skills

Research Questions

(i) Why is financial literacy significant for women entrepreneurs?
(ii) How can the cognitive approach to financial literacy be enhanced?

Objective (s) of the Research

(i) To raise financial literacy amongst women entrepreneurs to encourage financial responsibility and positive attitudes
(ii) To expand the degree of financial knowledge, financial responsibility and financial skills among women entrepreneurs towards effective financial decision-making.

2. Literature Reviews

Women's Economic Development and Sustainable Financial Healthy Society: Community development is a significant part of a nation's economic steadiness. Women's populations constitute the mainstream of citizens in Malaysia as an emerging and developing economies nation (Rashid et al., 2019). The government agency of the Ministry of Women, Family and Community Development (KPWKM) has distributed several kinds of funding and resources to improve its programs and organize more activities involving women particularly those economic activities (Ministry of Women, Family and Community Development, 2022). The government maximizes efforts to implement economic expansion missions according to its desires and goals. Governments are starting to recognize the issues and problems related to financial sustainability, thus this issue is being addressed in policy-making discussions. If any government is unable to work in this zone, it is advisable to team with communities, to highlight the issue in a worldwide context. As reported by a Globe Scan poll of specialists, the foremost role in attaining financial sustainability will be played by entrepreneurs (35%), and governments (24%) (Zhang, 2020).

Consequently, the Ministry had designed JPW on development for women. JPW is a vital platform for women entrepreneurs to speak out or stand to help the women's community around them. JPW is a prominent non-state performer in explaining the legitimate setting of a given zone (Bottazzi & Lusardi., 2021). It plays an important role in improving women's socio-economic well-being by conducting both community-based activities at the local level and professional development activities at the national level (Ricciuti & Calo, 2018). In other words, JPW helps women for good professions in the future. Women entrepreneurs will grow to be more dedicated, knowledgeable, expert and optimistic to enhance their financial well-being, thereby, supporting poverty reduction and economic growth (Rashid, 2019). Furthermore, there is an important value to be added by supporting women's growth activities which leads to sustainable financial health. Hence, improving financial literacy in monetary management is crucial to expanding the economic success of women entrepreneurs using efficient financial health and decision-making. A strong foundation of financial knowledge and capabilities leads to proper and knowledgeable decision-making (Erokhin and Gao, 2020), which is significant for individuals and community management levels.

Financial Literacy in Financial Management: In general, literacy discusses the skill to think fast, use sound decisions, and recognize ideas, often in a specific segment. In the meantime, financial literacy is an extensive term, defined as a competence to practice financial knowledge and skills to control financial resources efficiently (Gomez & Helmsing, 2020; Boisclair, Lusardi, & Michaud, 2017). The Organization for Economic Co-operation Development (OECD) defined financial literacy as a blend of consciousness, skill, knowledge, and attitude essential to do well in financial decision-making and eventually attain financial health. In the meantime, financial well-being concludes with the skill to guide an expressive and satisfied life free from financial doubts, in addition to being able to survive during financial surprises.

Variations in lifetime environments and emergencies without financial load (OECD, 2020). Financial literacy is similarly about the person's understanding of fundamental financial terms and the process of managing

anticipated and unanticipated expenses (Artavanis & Sara, 2020). Thus, financial literacy is associated with a person's capability to understand the financial impacts and inter-relationships of several features of business. Financial literacy is important to confirm the sustainable economic growth of society. Economic evolution and financial sustainability are deep-rooted in the financial literacy of a person, and it relates to a person's success which then contributes toward the sustainable growth of society (Gomez and Helmsing, 2020). Knowing about what financial literacy is and why it is vital to a low-scale business supports individuals to advance the necessary skills and competence to raise profits by handling the financial matters of business. An individual with a strong background in financial literacy is talented in assessing the effect of a corporate decision on financial statements and the financial well-being of the firm in the long term (Engels, Kamlesh & Philip, 2020). Financial literacy is capable of benefitting difficulty and productive outcomes towards financial competence (Brilianti &Lutfi, 2020).

According to Engels, Kamlesh & Philip (2020), financial literacy dimensions suggest that a person must have the aptitude and self-assurance to use his or her financial acquaintance to make comprehensive financial decisions (Ibn-Mohammed et al., 2020). Financial literacy is a substantial part of learning the monetary system and well-adjusted decision-making process. It affects the value of financial growth and responsible decision-making (Engels, Kamlesh & Philip, 2020).

Financial Knowledge and Understanding: The OECD definition of financial literacy acknowledges that an individual's dispositions play a significant role in determining whether or not they will act in a financially responsible manner, even if they possess the necessary information and knowledge. Financial knowledge refers to the cognitive and affective evaluation of an individual's financial situation. It encompasses their mental state and opinion regarding their financial circumstances. On the other side, financial literacy explains about learning of financial terms, ideas, and practices. Referring to the RBT, for businesses to obtain a competitive advantage, they need to possess resources that are valued, uncommon, and difficult to copy (Adam et al., 2022). Financial knowledge is a significant factor in the construction of financial literacy (Aydin & Selcuk, 2018). Individuals with financial knowledge, show that financial literacy is controlled by financial acquaintance and understanding (Frisancho, 2019; Fan & Chatterjee, 2018). Financially literate people have the information, skills and greater understanding to make smart decisions (Paskelian et al. 2019). This demonstrates that financial education advances financial literacy. Fundamental financial knowledge supports an individual to handle their association with money management. It is very significant to acquire financial knowledge as it is the fundamental technique of being economically independent. Learning to handle financial resources by get-together financial knowledge as early as individual life, thus helps to study the art of monetary saving and also to recognize its importance.

Financial Skills and Competence: Entrepreneurs can improve their financial performance and competitive positioning by managing their financial resources wisely and taking advantage of financial skills and competence (Paskelian et al., 2019). Entrepreneurs can make strategic financial decisions, allocate resources efficiently, and spot development possibilities by utilizing their financial skills and expertise, all of which contribute to their overall success (Paskelian et al., 2019). There is a substantial inter-relationship between financial acquaintance and financial acumen (Frisancho, 2019). The skills of an individual who obtained financial-linked training are improved as compared to an individual who did not obtain any financial-linked training. The expansion of relevant training that is particularly planned to enhance financial literacy and instill financial analyst skills and competencies by policy legislators and association leaders are capable of controlling finances. Hereafter, persons' finance skills can be established through their involvement in financial activities, discussions, and associated fundamental courses (Aydin & Selcuk, 2018). Financial skills required for entrepreneurship include various skills in financial management systems. Financial skills can apply to many professions in the business industry, including entrepreneurs. Every entrepreneur will have different finance skills; however, all entrepreneur requires several essential financial skills. These essential skills will be discovered in more detail in this study. By utilizing various financial skills, entrepreneurs will be able to uphold good financial practices and support a business to maintain a concrete financial position. Furthermore, all these skills allow entrepreneurs to handle unexpected financial crises and resolve financial issues in a means that helps the entrepreneur. Financial skills are acquired via proper study as well as professional experience.

Financial Responsibility: The Agensi Kaunseling dan Pengurusan Kredit (AKPK) of Bank Negara has conducted a survey that has revealed a strong association between financial responsibility and accountability versus financial literacy. Malaysia is currently confronted with a concerning situation whereby women entrepreneurs are experiencing suboptimal performance, weak debt management (Prakash et al., 2022), unproductive spending, poor financial planning, and irregular budgeting. Hence, there is a strong linkage between the financial responsibility of the person who engaged in financial management (Bottazzi & Lusardi, 2021; Boisclair, Lusardi, & Michaud, 2017). Financial responsibility is a significant instrument to enhance positive financial decisions and independence of women entrepreneurs. Financial responsibility and accountability must start early to prepare women entrepreneurs with the capability to make good financial decisions and pursue entrepreneurship opportunities that are practicable (Bottazzi & Lusardi, 2021).

The absence of financial responsibility among women entrepreneurs causes trouble in retrieving financial opportunities. Women entrepreneurs shall gain an advantage from financial literacy education and accessibility towards financial saving. Financial measures must be considered to enhance the degree to which way women can elevate their revenue rather than minimize expenses when they are unable to make smart financial decisions (Prakash et al., 2022). Financial responsibility could improve their money management behavior and skills. Thus, to ensure sustainability, women entrepreneurs must possess an excellent financial attitude and positive behavior. There is a significant connection between the financial responsibility of people who are engaged in financial literacy very frequently (Wagner, 2015). As reported by Agnew (2018), the relationship between financial literacy and financial attitude showed a significant relationship and influenced financial responsibility. Hence, there is a substantial association between financial literacy and financial responsibility.

3. Methodology

Description of Methodology: This study emphasizes a cognitive approach to financial knowledge and accountability among women entrepreneurs in Malaysia by including a group of leaders and senior representatives as respondents. The goal is to alleviate women entrepreneurs' economic well-being to encourage financial responsibility and positive attitudes. Thus, the study focuses on the subsequent factors; (i) demographic characteristics, (ii) financial knowledge and understanding, (iii) financial skills and competence, and (iv) financial responsibility. The identified factors are estimated to affect the objective of the current study. The factors of demographics include gender, age, and socio-cultural background. The factor of financial knowledge and understanding comprises the level of higher education, appropriate talent and experiences. Financial skills and competence consist of related training, seminars and workshops. Whereby financial responsibility comprises behavior and attitude, public influence, sentiment values and emotion and also threats in money management matters. Additionally, all the stated factors will be used to alleviate women entrepreneurs' economic well-being. The current study demonstrates a guiding principle using the exploratory sequential approach in mixed-method research design. The study will employ data from combining research methods of qualitative approach using the instrument of interviews as well as a quantitative approach using the instrument of questionnaires. Qualitative data analysis concentrates on the method of thoroughly searching and ordering the interview records and transcriptions. A series of interviews is vital to analyze in-depth information on subject matters related to the selected respondents.

The interview feedback will be recorded, documented and transliterated by applying the procedure of thematic analysis to identify exactly "what is present practice versus what is required to be". Highly matching items from the interview responses will be identified as a construct item to develop a preliminary survey questionnaire to gather data and evidence about the factors stated earlier. As for the sampling plan, the researchers will select a probability sampling method using stratified random sampling, which includes dividing the total population into homogeneous groups (similar attributes). Afterward, a random sample from a population is selected from each group. The group comprises women entrepreneurs from selected states in Malaysia. Followed by data analysis, whereby the input of data will be analyzed by applying Structural Equation Modeling (SEM) using AMOS. The gathered data and information will be able to enhance the foundation of financial literacy for the financial sustainability of women entrepreneurs in Malaysia. The research findings, discussions, implications, suggestions, and recommendations of the study are to be thoroughly discussed to provide a strong literature review about financial literacy.

4. Contribution of the Study

The skills and knowledge of financial literacy are a novelty by itself as there is no such framework yet to guide women entrepreneurs in Malaysia towards the promotion of positive financial behavior based on a strong cognitive approach to financial knowledge and accountability. Grounded on the theory of RBV, the outcomes from this study, bring forth an even greater realization of the significance of financial competence among women entrepreneurs and their impact not only on these women's economic well-being but on the community as well. The proposed knowledge of financial literacy is not unique to addressing the cultural preference among women entrepreneurs in Malaysia but at the same time, offers a comprehensive and futuristic framework that is aligned with the National Women Policy and in tandem with the vision and mission of KWKPM of building the potentials of women from various levels of the society and in all sectors, and empowering them as a change agent for the society to develop a new resilience of financial literacy for women entrepreneurs based on Malaysian.

To propose a resource-based view theory for a new approach to developing women-based entrepreneurship for economic well-being, and to support National Women Policy and KPWKM in their goals for the economic empowerment of women, consistent with the Vision for Shared Prosperity 2030 that was mooted in the 12th Malaysia Plan, and the Malaysia Madani Policy to drive sustainable economic growth at the regional and global levels. More specifically, this study drives to introduce significant contributions from the theoretical and practical perspective on the grounds of the cognitive approach to financial well-being among women entrepreneurs. The findings will contribute to elevating the financial knowledge, skills and responsibility, particularly among women entrepreneurs to direct towards sustainable financial wellbeing in Malaysia. Aligning with the principles of Shared Prosperity Vision and the mission of SDG2030 and National Strategy for Financial Literacy 2019 – 2024, towards "Developing Malaysia MADANI" to encourage financial development activities for financial sustainability of women entrepreneurs.

5. Conclusion

This study focuses on alleviating women entrepreneurs' economic well-being to encourage financial responsibility and positive attitudes. The outcome of this study will be able to expand the degree of financial knowledge, financial responsibility and financial skills among women entrepreneurs towards smart financial decision-making. The novelty of the current study will be enabling women entrepreneurs in smart monetary planning and forecasting to develop a wealthy society. Furthermore, the current study also means to elevate the degree of financial knowledge, responsibility, skills, and competence among Malaysian women entrepreneurs with respect to a strong foundation of financial management. This is crucial to boost the knowledge of financial literacy, with a positive intention to produce an established, competent and wealthy society. In conclusion, the study will give importance to the economic success of women entrepreneurs in Malaysia by designing an effective financial structure mainly for those commercial activities that are hypothetically valuable to a range of households. This study is potentially of great significance to guide women entrepreneurs with the accurate and sufficient skills, talent and knowledge to surely make smart financial decisions and planning at every period of their lifespan to strengthen money management skills among women-owned business enterprises.

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Acceptance Factors Affecting the Intention to Use Mobile Payments: QR Code Applications

*Nani Shuhada Sehat, Siti Rohana Daud, Khaizie Sazimah Ahmad, Intan Liana Suhaime, Jumaelya Jogeran
Universiti Teknologi MARA, Malaysia
*nanis464@uitm.edu.my, sitirohanadaud@uitm.edu.my, khaizie.sazimah@uitm.edu.my,
intanliana@uitm.edu.my, jumaelya749@uitm.edu.my

Abstract: This study explores the intentional use of QR code applications in Malaysia through the lens of the Unified Theory of Acceptance and Use of Technology 2 (UTAUT 2), focusing on five key constructs: which is performance expectancy (PE), effort expectancy (EE), hedonic motivation (HM), habit (H), and trust (TR). An online survey was constructed and disseminated to a random sample of 215 respondents located in the Southeast region. The primary objective of this survey was to collect data regarding their intentions to utilize QR code applications. The collected data were analyzed using the Statistical Package for the Social Sciences (SPSS), aiming to understand the relationship between the UTAUT 2 factors and behavioral intention towards QR code usage. The analysis revealed that all the UTAUT 2 factors which are performance expectancy, effort expectancy, hedonic motivation, habit, and trust have a positive significant relationship with the behavioral intention to use QR codes application. Among these, trust emerged as the most influential factor, underscoring its critical role in the adoption of QR code technology. This finding highlights the importance of addressing security and privacy concerns to foster trust among users, which is pivotal for the wider acceptance and use of QR codes in Malaysia. The study provides valuable insights for developers, marketers, and policymakers looking to enhance the adoption of QR code technology, emphasizing the need to build a trustworthy and user-friendly QR code ecosystem.

Keywords*: Acceptance, Behavioral Intention, UTAUT2, Expectancy, Trust.*

1. Introduction

Mobile payments are used for a wide range of financial transactions, providing a convenient and efficient alternative to traditional payment methods like cash or physical credit/debit cards. This method is becoming more and more popular because it is convenient—you can pay with just a few taps on your phone—more secure than traditional ones because it can safeguard your financial information, and best of all, because it involves contactless transactions, which can lessen physical contact in this age of pandemics. Mobile payments are a form of payment where the user credits or stores their money in an electronic wallet that functions similarly to a wallet but in a digital mode. This allows users to pay for purchases instantly rather than having to look for a physical wallet and hand over cash to the merchant (Lim, 2020). Mobile payment services, often described as a mobile wallet, mobile money transfer, contactless payment, or proximity payment are the rapidest growth segments of mobile marketing (Jung et al., 2020). The market for cards and payments in Malaysia is estimated to be worth $62.4 billion in 2022 and grow at a Compound Annual Growth Rate (CAGR) of more than 11% from 2022 to 2026 (GlobalData, 2022). The Malaysian payments market is still heavily dependent on cash, but it has significant growth potential as it transitions to digital payments. The ongoing digital transformation of the industry has been facilitated by government efforts such as the adoption of an interchange fee cap, the migration of payment cards to support contactless payments, fees for ATM transactions, and the construction of payment infrastructure.

There are several types of mobile payments which are Near Field Communications (NFC) payments such as Apple Pay, Google Pay, and Samsung Pay, quick response code (QR code) payments for instance Alipay, MAE, DuitNow QR, and various banking apps, carrier billing that often used for buying digital content like apps, games, and media, mobile banking apps, in-app payments for example food delivery apps, and digital wallets. QR code payment is a method of making transactions by scanning a QR code using a mobile device, typically a smartphone or tablet. This revolutionized technology has gained popularity due to its convenience, versatility, and secure alternative to traditional payment methods. Masahiro Hara created QR Codes in 1994 while playing the Go game, which consists of a 19 x 19 grid with black and white stones scattered throughout (Microsoft, 2023). He worked for the Japanese corporation Denso Wave, a branch of Denso, a wholly owned subsidiary of the automaker Toyota Motor Corporation, to track vehicle components as they were put together (Gregersen, 2023). Sharp exposed the first mobile with a QR scanner in 2002, and other mobile manufacturers quickly

followed (Microsoft, 2023). According to a survey conducted in 2021, 25 percent of Malaysian respondents claimed to have utilized rapid response (QR) code payment, down from 50 percent the year before. The use of digital payment systems is rising in Malaysia despite a decline in the use of QR codes (Statista, 2023).

QR codes offer a versatile tool for various applications, including mobile payments, marketing, information sharing, and authentication purposes. In the context of mobile payments, QR codes are increasingly recognized for their potential to facilitate convenient, fast, and secure transactions. However, despite these advantages, the adoption rate among Malaysian consumers and businesses has been somewhat sluggish. Several factors contribute to the current state of QR code application use in Malaysia. Firstly, there is a lack of awareness and understanding of the technology among both consumers and merchants. This knowledge gap can lead to hesitancy in adoption due to concerns over security and privacy. Trust in the technology is paramount, especially for financial transactions, and establishing this trust is a crucial step toward broader acceptance. Furthermore, the infrastructure for QR code payments is still developing. While major cities may have a higher level of readiness and acceptance, smaller towns and rural areas might not have the necessary technology or network connectivity to support the widespread use of QR code applications. Given that QR codes are now widely applied in interactive e-commerce applications, sellers may advertise their products while also making payments easier for customers to complete purchases at their fingertips. Educating the public about QR code payments is one of the difficulties that must be overcome throughout implementation. Amarullah et al. (2021) mentioned that digital payments need reliable internet access, and the adoption of QR code payments may be limited in places with poor signals.

Then, the device benefits from everyone's unique abilities some people have cell phones with excellent code-scanning features, though others have subpar smartphones. Using QR code mobile payment can indeed expedite transactions. This technology enables users to complete payments swiftly by simply scanning a QR code. This method eliminates the need for manual data entry or the use of physical payment cards, streamlining the process and potentially reducing wait times at checkout. This efficiency can be particularly beneficial in situations where speed and convenience are valued, such as in retail stores, restaurants, and other points of sale. The Unified Theory of Acceptance and Use of Technology (UTAUT) is a theoretical model developed to understand and predict individual acceptance and use of technology. It was introduced by Venkatesh et al. (2003) aiming to consolidate the various theories and models of technology acceptance that had been proposed in the literature up to that point. UTAUT model incorporates and renames key constructs from the Technology Acceptance Model (TAM) to provide a broader and more integrated framework for understanding technology acceptance. In the UTAUT model, key concepts from TAM are redefined with new titles. What TAM refers to as Perceived Usefulness (PU) is termed Performance Expectancy (PE) in UTAUT, and Perceived Ease of Use (PEU) is relabelled as Effort Expectancy (EE). Additionally, the concept of Social Norms (SN) in TAM has been updated to Social Influence (SI) in the UTAUT framework (Amani & Arvanitis, 2011).

Venkatesh et al. (2003) introduced the UTAUT model, identifying four key determinants that influence both the behavioral intention to use and the actual usage of information technology: performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating conditions (FC). Later, Chang (2012) referenced an update by Venkatesh et al. (2012), which expanded the original UTAUT framework by incorporating three additional factors: hedonic motivation (HM), price value, and habit (H). Venkatesh et al. (2011) identified trust (TR) as a critical factor for both the initial adoption and ongoing use of e-commerce. The most recent evolution of the technology acceptance model, following UTAUT, is UTAUT2, introduced by Venkatesh et al. (2012). The main purpose of this study is to explore and present the results of research aimed at identifying the determinants that influence consumer intentions to utilize mobile payment systems, specifically those based on QR code technology. In Malaysia, enhancing the adoption of mobile payment solutions among consumers has proven to be a challenging effort. Given that QR code-based mobile payment methods are relatively new to both corporations and individuals in the country, their adoption rates remain low among the consumer base. To gain a deeper insight into this issue, the researcher has pinpointed various factors that affect the intention of consumers to adopt mobile payment technologies. Furthermore, a theoretical model has been developed to encapsulate these factors, and the validity of this model has been assessed through the analysis of data gathered from a quantitative survey.

Research Objectives:

- To determine the relationship between performance expectancy, effort expectancy, hedonic motivation, habit, and trust with behavior intention to use mobile payment based on QR codes.
- To identify the factors that influence consumers' intention to use mobile payment based on QR code technology.

2. Literature Review

To understand and predict users' intention to use technology there are some variables that researchers will use, such as mobile payments, the Unified Theory Acceptance and Use of Technology (UTAUT), performance expectancy (PE), effort expectancy (EE), hedonic motivation (HM), habit (H), and trust (TR).

Mobile Payment: A mobile payment, also known as a mobile wallet or mobile money, refers to a financial transaction that is conducted using a mobile device, such as a smartphone or tablet, to transfer money or make a payment. This technology leverages digital platforms and wireless communication networks to enable users to perform various financial activities without the need for physical cash, checks, or traditional banking methods. Dahlberg et al. (2008) defined mobile payment as payments for goods, services, and bills with a mobile device by taking advantage of wireless and other communication technologies. Raina (2019) defined mobile payment as the transaction of money that is conducted through a mobile network through various mobile devices, such as smartphones or PDAs, and mobile terminals. Meantime, Mohd Ariffin et al. (2020) stated that mobile payment refers to the processing of payment transactions in which the payer initiates, authorizes, or completes the transaction through mobile communication channels and mobile devices. Using a mobile terminal to pay for products or services is known as mobile payment. Mobile payment users can utilize their mobile devices or proximity-sensing devices to send payment instructions directly or indirectly to a bank financial enterprise, enabling currency payments and cash transfers (Yong et al., 2021).

Mobile payments have become increasingly popular and diverse, providing various ways for individuals to make transactions using their mobile devices. According to a survey conducted in 2021 by Statista (2023), 25 percent of Malaysian respondents claimed to have implemented quick response (QR) code payment, down from 50 percent the year before. The use of digital payment systems is rising in Malaysia despite a decline in the use of QR codes. Commission Factory (2023) in their report stated that with the emergence of e-wallets and cashless transactions, preferred payment methods in Malaysia are shifting more and more towards digital solutions. Credit and debit cards, for instance, continue to be widely used conventional payment methods. Traditional payment methods are also being updated, such as "cashless" cash on delivery and virtual credit cards. According to projections by Statista (2023), Malaysia's e-commerce sales would reach $11.65 billion in July 2023. Malaysia has experienced a steady increase in internet penetration over the years. As more people gain access to the internet, it becomes easier for them to explore online shopping platforms and make purchases conveniently from their devices. QR codes have played a pivotal role in the growth of e-commerce by providing a user-friendly, convenient, and secure way for customers to make digital payments. QR codes provide a simple and efficient way to facilitate digital payments. Customers can scan QR codes using their smartphones to initiate transactions without the need for physical cards or cash.

A two-dimensional scannable code called a QR code serves a similar purpose as the conventional barcodes that may be found on numerous products (Rasyidah & Ahd. Moess, 2023). Short message service (SMS), near-field communication (NFC), and QR codes are the three primary types of mobile payment tools. To exchange simple text messages between two mobile devices, SMS mobile payments are remote systems that need a communication protocol (Valcourt et al., 2005). NFC and QR codes are both proximity technologies. Without utilizing mobile networks, NFC payments use radio frequency channels to connect payment terminals and vending machines (Coskun et al., 2012). Tu et al. (2022) in their study on QR code adoption stated that a QR code is a data storage technology that uses a two-dimensional bar code or dot matrix that may be printed on paper or displayed on a screen to deliver information and is read by specialized equipment. Rasyidah & Ahd.Moess (2023) mentioned the main benefit of QR codes is the low cost for customers and retailers. Customers only need to open their mobile banking app or electronic wallet, scan the QR code to verify the purchase's total, and then submit payment to complete the transaction. Contrasting QR mobile payment, other mobile payment systems need consumers to browse through the payment website, sign in with user

credentials, enter the account information of the seller, and obtain a security PIN before completing the payment which takes an additional number of stages (Ibrahim et al., 2019).

As for retailers, they can take electronic payments in this way by simply applying a sticker with a QR code and the payment will automatically be credited to the account (Rasyidah & Ahd. Moess, 2023). In 2020, 11 million US households alone were predicted to have scanned a QR Code, according to a recent Statista survey and the number of scans would have increased from the expected 9.76 million in 2018 (Garg, 2018). These days, QR Codes are widely used. In part because more people worldwide are using smartphones. From 3.2 billion in 2016 to an expected 6.8 billion in 2023, it has grown dramatically. This equals an increase of 4.2% yearly (Garg, 2023). In recent years, Malaysia has embraced QR code-based mobile payment. Some of the most well-known services are Maybank QR Pay, Boost, Touch & Go Mobile Wallet, DuitNow QR, and so on. Even though it took some time for consumers to adopt it in the beginning, it is now very popular, especially among younger generations (Rosli et al., 2020). Therefore, it is more appropriate for the study to concentrate on a single payment method when analyzing the behavioral intention of mobile payment (Uzairi et al., 2021). As a result, this study decides to concentrate primarily on the QR mobile payment system, as this technology is present in most of the mobile payment systems that are widely utilized in Malaysia.

Unified Theory of Acceptance and Use of Technology (UTAUT): Unified Theory of Acceptance and Use of Technology (UTAUT) is a theoretical framework that aims to explain and predict how individuals adopt and use technology, such as information systems and digital tools, in various contexts. Chang et al. (2021) mentioned that Venkatesh et al. (2003) proposed the Unified Theory of Acceptance and Use of Technology (UTAUT) based on eight Technology Acceptance theories or Behavior Intention theories, including the Theory of Reasoned Action (TRA) by Fishbein and Ajzen (1975), the Technology Acceptance Model (TAM) by Davis (1989), the Motivational Model (MM) by Davis et al. (1992), the Theory of Planned Behavior (TPB) by Ajzen (1991), a model combining TAM and TPB (C-TAM-TPB) by Taylor and Todd in 1995 (Peng & Jiang, 2022), the model of PC utilization by Thompson et al. in 1991 (Alomary & Woollard, 2015), the Innovation Diffusion Theory (IDT) by Roger (1995), and the Social Cognitive Theory (SCT) developed by Albert Bandura in 1986.TAM has been one of the most influential models of technology acceptance, with two primary factors influencing an individual's intention to use new technologies which are perceived ease of use (PEU) and, perceived usefulness (PU) (Davis, 1989). A central factor in TPB is the individual's intention to perform a given behavior. Intentions are assumed to capture the motivational factors that influence behavior; they are indications of how hard people are willing to try, of how much effort they are planning to exert, to perform the behavior (Ajzen, 1991).

The two most essential concepts from TAM have been retitled in the UTAUT model. Perceived Usefulness in TAM has become Performance Expectancy in UTAUT while Perceived Ease of Use become Effort Expectancy in UTAUT, and Social Norms have become Social Influence (Amani & Arvanitis, 2011). Venkatesh et al. (2003) stated that UTAUT proposed four primary factors that affect behavioral intention and actual usage of information technology which are performance expectancy (PE), effort expectancy (EE), facilitating conditions (FC), and social influence (SI). Chang (2012) mentioned Venkatesh et al. (2012) stated that three additional constructs were added to the original UTAUT model which are hedonic motivation (HM), price value, and habit (H). These new constructs likely contribute to a more comprehensive understanding of technology adoption and use. Ventakesh et al. (2012) designed this model with a focus on the individual rather than organizational consumers. Rosli et al. (2020) in their paper stated that comparing the UTAUT2 to earlier technology acceptance models, the UTAUT2 includes most external elements that directly influence the behavioral intention to use technology, which increases its ability to explain the behavior. Alalwan et al. (2017) in their research on mobile banking adoption have endorsed trust (TR) as a key element in determining how customers perceive and intend to use this technology based on their research from the previous researcher.

Yong et al., 2021 found that people's attitudes toward mobile payment services are proven to be influenced by customer trust, and numerous studies have shown that consumer trust is positively associated with consumers' electronic commerce behavior, including mobile payment and mobile banking. It is important to add this new construct since it may be related to the user's intention to utilize QR Code mobile payment due to the fact the study is about payments and money (Rosli et al., 2020). Thus, to widen the theoretical scope of UTAUT2, trust has been added as an external element as an extension to UTAUT2 in the same conceptual model, as strongly

suggested by Venkatesh et al. (2012) (Alalwan et al., 2017). Anggraini & Rachmawati (2019) chose the UTAUT2 model as their framework because UTAUT2 is the latest model to study the acceptance and use of technology, especially in the consumer context. UTAUT2 is a widely recognized model for understanding user acceptance of technology and predicting their behavioral intentions. The aspects that are acceptable for our study include performance expectancy (PE), effort expectancy (EE), hedonic motivation (HM), habit (H), and trust (TR). The researchers seek to investigate the factors influencing the behavioral intention to use QR code payments in the South Malaysia region.

Behavioral Intention (BI): Behavioral intention is defined as the intention to perform a behavior that stems from conscious decision-making (Davis, 1989). Fishbein & Ajzen, 1975 defined intention as to perform a behavior resulting from conscious decision-making. Ali et al. (2021) in their study stated that intention refers to the extent individuals are willing to go and how much willpower they intend to put into the effort to carry out a specific behavior while behavioral intention refers to the faster that it for a person to accept new technology, the stronger their intention to do so. This intention refers to an individual's willingness to engage in a specific action and the four constructs are performance expectancy, effort expectancy, social influence, and facilitating conditions (Venkatesh et al., 2003). A person who recognizes that the consequence of performing a behavior is positive will have a positive attitude, belief, and perspective on the behavior, whereas a negative outcome will produce a negative attitude toward the motivational factors that influence a specific behavior (Rasyidah & Ahd. Moess, 2023). According to the TAM, the primary key effect on the intention to use is a person's attitude toward using a technology, which refers to the degree to which an individual places a positive or negative emphasis on the technology (Davis et al., 1989).

Amarullah et al. (2021) indicated that behavioral intention (BI) among Indonesian consumers to use QR codes for mobile payments is positively impacted by performance expectancy (PE), habit (H), and trust (TR), whereas it is not affected by effort expectancy (EE) and hedonic motivation (HM). Hedonic motivation, trust, self-efficacy, and habit were important predictors of behavioral intention, while habit and behavioral intention might be utilized to explain the adoption intention of Internet banking in Pakistan (Sharif and Raza, 2017). Anggraini & and Rachmawati (2019) in their study on OVO application among Indonesians indicated that performance expectancy and effort expectancy do not positively influence the intention of OVO payment adoption in Indonesia. Meantime, other factors like social influence, facilitating conditions, hedonic motivation, price value, trust, and behavioral intention have proven to have a positive effect on OVO payment adoption. Linck et al. (2007) found that EE, PE, facilitating conditions, and social influence, affect intention to use mobile payment systems.

Srijan (2022) found that SI, EE, PE, FC, and PS all influence the behavioral intention to use QR code payments. The results of Jung et al. (2020) showed that performance expectancy (PE), social influence (SI), compatibility, knowledge, and trust (TR) had positive and significant relationships with BI. On the other hand, EE, risk, and relative advantage were not significant predictors of BI's use of mobile payment among US consumers. The findings by Teo et al. (2015) showed that only performance expectancy (PE), effort expectancy (EE), trust (TR), and facilitating conditions (FC) are significant with the intention to adopt mobile payment, while experience has a moderating effect on the relationship between PE and mobile payment BI. PE and social influence have a positive effect on mobile payments BI, EE and facilitating conditions are not significant while risk has a negative effect on mobile payment BI (Lee, 2019). Putranto (2020) reveals that only H and PE have a significant effect on BI mobile payments in Indonesia.

Performance Expectancy (PE): Performance expectancy (PE) is the perceived usefulness of the technology in enhancing the user's performance or productivity. Davis et al. (1992) defined it as the degree to which a person believes that using the system will help him or her to attain gains in a job. Venkatesh et al. (2003) defined PE as the degree to which an individual believes that using the system will help him or her to attain gains in job performance. Once again, Venkatesh et al. (2012) stated that PE, also known as perceived usefulness (PU) in TAM, is the extent to which using technology will provide benefits to consumers in performing certain activities. In the context of this study, PE refers to the extent to which a person believes that using payments via QR code will enable them to improve their performance and help them better in daily life. PE was found in previous studies on people's adoption of mobile payments as an important variable influencing people's desire to use mobile payments (Jung et al., 2020). Rosli et al. (2020) in their study on consumers around Klang Valley's

intention to use QR code payments show that behavioral intention is positively influenced by PE. Users believe that using a QR code for mobile payment has helped them in their transactions.

According to Mohd Ariffin et al. (2020), who performed a survey on mobile payment acceptance among Section 7 retailers in Shah Alam, PE had a high impact on respondents' intention to use mobile payments. The PE variables were the most effective predictors of intention to use the target technology within each of the individual models examined (Chang, 2012). Yong et al. (2021) conducted an empirical study on mobile payment acceptance among the Klang Valley population showing that the PE of mobile payment services is an appropriate and effective payment transaction, and it has become a significant factor in persuading Malaysian customers to use such services. Rasyidah & Ahd. Moess (2023) indicated that PE was the second strongest predictor in the model, and it has a significant positive relationship with the intentions to use QR code mobile payment among Malaysian Muslim Millennials. Nur & Panggabean (2021) showed that PE has a significant positive effect on behavioral intention to use mobile payment services among Generation X. According to Amarullah et al. (2021), behavioral intention (BI) among Indonesian consumers to use QR codes for mobile payments is positively impacted by performance expectancy (PE). In contrast, Anggraini & and Rachmawati (2019) in their study on OVO application among Indonesians indicated that PE has proven to have no significant relationship with BI.

Effort Expectancy (EE): According to Davis et al. (1989), a person's intention to embrace a new system is not only predicted by how highly the system is valued but also by how little effort is required to use the system. Effort expectancy (EE) is defined as the degree of ease associated with the use of the system (Venkatesh et al. (2003) which can reduce users' efforts in their work (Yong et al., 2021). EE is perceived as easy to use with specific information systems and technology (Raza et al., 2018). Like PEOU in TAM, it describes the perceived amount of effort a user must expend to understand and use new technology (Yong et al., 2021). From the perspective of mobile payment, this factor explains where individuals are free from effort and understand the role of certain types of mobile payment (Ventakesh et al., 2012). Therefore, EE could be a key factor in deciding customers' intentions to utilize such technology given that mobile banking is unique in that it requires a certain amount of knowledge and expertise (Alalwan et al., 2016). In Wang & Yi (2012) study, EE has been determined as one of the most important indicators of an intention to utilize mobile payments. Leong et al. (2021) found that there is a direct and significant relationship between EE and mobile payment usage intention. Yong et al. (2021) in a study on mobile payment acceptance in Malaysia discovered EE as the most influential factor compared with the other UTAUT2 components. Rosli et al. (2020) revealed that EE has a significant relationship with BI of mobile payments among the people in urban area in Klang Valley, Selangor. The empirical findings have confirmed the significant relationship between EE and BI in the use of mobile banking among Jordanian bank customers (Alalwan et al., 2017).

Some of the findings are contrary to earlier results, Imani & Herlanto (2020) discovered that EE had no statistically significant impact on behavioral intentions to use the QR Code features due to Generation Z, who is the study's respondents and were technologically literate from birth, is responsible for these findings since they are so accustomed to using technology. According to Slade et al. (2015), there is no correlation between behavioral intention to utilize mobile payments among UK consumers and EE. This explains why the effect of effort expectancy on behavioral intention is more significant for non-users who are unaware of mobile payment and thus unfamiliar with its functionality and for those who are already aware of mobile payment and are likely to be familiar with how remote mobile payments work. Oliveira et al. (2016) discovered that EE is significant for PE but not for BI to use mobile payment among consumers in Portugal because the users might not be prepared to test the new technology if they do not recognize the benefits and attributes of mobile payment. Anggraini & Rachmawati (2019) in their study on OVO application among Indonesians indicated that EE has proven to have no significant relationship with BI. Amarullah et al. (2021) findings also found that EE did not have a significant effect on mobile payments BI among Jabodetabek residents. The lack of this influence can be attributed to the fact that the respondents are now accustomed to using mobile phones and the internet in both their daily lives and for business, giving them ample knowledge and expertise with these technologies.

Hedonic Motivation (HM): Hedonic motivation (HM) is a unique addition to UTAUT2 compared to the original UTAUT model. It specifically addresses the pleasure or enjoyment a user expects to derive from using the technology. Brown & Venkatesh (2005) defined hedonic motivation (HM) as the fun or pleasure derived from

using technology and it has been shown to play an important role in determining technology acceptance and use. Rosli et al. (2020) defined HM as the feeling of pleasure and satisfaction that individuals get when using existing technology. For this study context, HM focused on how the consumers feel pleasure and satisfaction once using QR code payment technology. Ventakesh et al. (2012) categorized HM as one of the concepts under intrinsic utilities. In the HM context, mobile payment makes it possible for a new way to conduct financial transactions, which encourages users to adopt it (Oliveira et al., 2016). HM is a significant determinant of behavioral intention and was found to be a more important factor than performance expectancy (PE) in non-organizational contexts (Ventakesh et al., 2012). HM has also been discovered to be a significant factor in technology acceptance and use in the consumer context (Childers et al. 2001). Rosli et al. (2020) in their study discovered that HM had a significant effect on users' behavior intentions towards the use of the QR code mobile payment. Alalwan et al. (2017) in their findings reveal that HM was empirically demonstrated to be a significant factor affecting Jordanian customers' intention to adopt mobile banking. According to Hariyanti et al. (2020), Bank Jatim Indonesia customers had the highest levels of satisfaction while using the mobile banking application, demonstrating that HM has a significant effect on BI.

Khatimah et al. (2019) assessed the effects of HM and social influence on the desire to use e-money in Indonesia and discovered that both components play a vital role in encouraging this intention. In the context of this study by Muzaldin et al. (2022) HM is discovered to be the most important and significant variable in determining the behavioral intention of the mobile wallet. Baptista & Oliveira (2015) reveal the significant relationship between HM and BI mobile payment among their respondents in Mozambique. Iskandar et al. (2020) revealed that the behavioral intention of Indonesian customers is significantly positively influenced by Anggraini & Rachmawati (2019) in their study on OVO application among Indonesians indicated that HM proven has a significant relationship with BI. In contrast, Amarullah et al. (2021) conducted a study of QR code payment that focused on people in the urban area of Jabodetabek, Indonesia showing that HM does not influence QR payments BI Hedonic motivation does not influence behavior intention because QR code payments is present in the community with outreach to merchants as an alternative payment method. Oliveira et al. (2016) also discovered that HM is not a significant predictor of the behavioral intention to adopt mobile payment among the population in Portugal.

Habit (H)*:* In the context of UTAUT2, habit (H) refers to the established patterns of behavior that individuals develop over time through repeated interactions with technology. H is not explicitly included as a separate construct in the original UTAUT model, but it can influence an individual's acceptance and use of technology. Habit (H) refers to the tendency to perform behaviors automatically due to previous repeated actions. Limayem et al. (2007) have defined habit as the extent to which people tend to perform behaviors automatically because of learning and is measured by the degree to which a person believes a behavior is automatic. H has been defined as a pattern of individual tendencies in using existing technology (Thu Nguyen et al., 2020). When someone tends to use technology over a certain period, that person develops a particular habit of using that technology (Limayem et al., 2007). In this study, the habit refers to a user's ability to use QR code-based payments frequently enough for it to eventually become ingrained. Imani and Herlanto (2020) discovered that H is the factor that has the most impact on how people intend to behave but is found to be not significant to the actual adoption of the use of the QR Code feature. Rosli et al. (2020) in their study revealed that H has a significant relationship in determining the customer's BI in urban areas around Klang Valley towards QR code payments.

Habit has a significant impact because most people in Jabodetabek are today exposed to mobile phones and the internet almost frequently, especially generations Y and Z, who help people become accustomed to and create the habit of utilizing modern technologies like mobile banking and digital wallets (Amarullah et al., 2021). Sharif and Raza (2017) also determined that H has a positive influence on mobile banking BI among Pakistan consumers. Thu Nguyen et al. (2020) revealed a positive significant relationship between H and digital banking services in Vietnam. Mohd Ariffin et al. (2020) study found that H has a significant relationship with mobile payment BI among Malaysians. According to the findings of the study by Hariyanti et al. (2020), H significantly affects BI among users of the Bank Jatim Mobile Banking application. In contrast, Oliveira et al. (2016) study noted that the habit construct was not included in their research model since mobile payment is a relatively new technology and has not yet become widely used by consumers to produce a habit. Eren (2022) mentioned that even while it is possible that the epidemic period hastened the experience of using a QR code for mobile

payments, it's anticipated that after the pandemic, people's payment H will have stabilized, and this is the reason why the researchers choose H as one of the study variables.

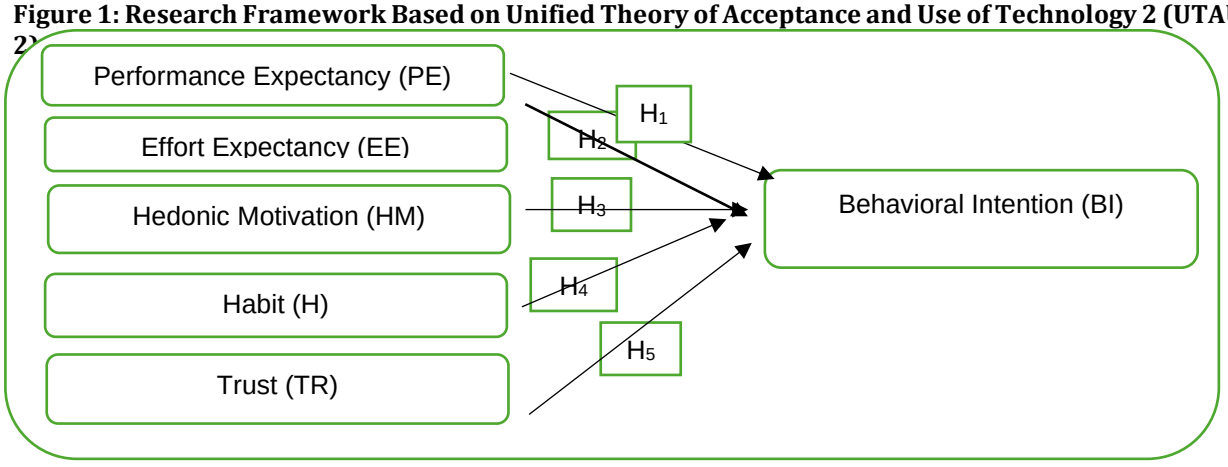
Trust (TR): In new technologies and digital media, trust (TR) has been proven to be an essential element since it has a significant effect on people's acceptance, intentions to use, and attitudes toward it (Mou et al., 2017). Trust (TR) refers to the belief that a person or organization's integrity, ability, and benevolence can be trusted. Trust is a main element of adoption and continuance use of e-commerce (Venkatesh et al., 2011). Khalilzadeh et al. (2017) defined TR as an individual's belief that a supplier will perform certain activities according to the latter's expectations. TR is a sense of safety and guarantee provided by the service provider, which can lead to higher acceptance and use (Leong et al., 2021). In the technological e-commerce world, where uncertainty and a lack of one-on-one human interaction exist, trust is a crucial factor to consider (Pavlou & Gefen, 2004). Slade et al. (2015) included many academics who have adapted the idea of TR in the adoption of technology, particularly in mobile payment services, due to the uncertainty that comes with living in a VUCA (volatility, uncertainty, complexity, and ambiguity) world today. Hanafizadeh et al. (2014) in their study on mobile banking adoption found that the TR of the customers needs to be formed and preserved in the long term, and understanding the risks perceived by the customers is very useful for the banks in identifying the obstacles to adoption and removing them.

Because it involves financial transactions with electronic devices, TR is seen as being extremely relevant to the context of mobile payments (Oliveira et al., 2016). TR in the payment system will lessen the need to comprehend, control, and monitor activity, enabling users to access services quickly and effectively without expending a lot of work on the translation of online services (Muñoz et al., 2010). Kamis et al. (2022) added suppliers must be proactive in addressing consumer skepticism of electronic transactions since consumers will not use a payment system unless they feel comfortable using it. TR has been determined to have a significant influence on the acceptance of mobile payments in Malaysia (Yong et. al., 2021). Despite all the positive findings that TR has a significant influence on BI mobile payment, studies by Grayson and Ambler (1999) indicated that TR may have a good effect on short-term relationships but not on long-term relationships, which means that trust may not always have a favorable impact on service use.

Yong et al. (2021) determined that TR in mobile payment does not have any significance in influencing continuance intention because consumers are more likely to be satisfied with the service when they believe the service provider is trustworthy. According to Susanto et al. (2016), there is no statistically significant correlation between trust and continued usage intention. Without speaking to a bank employee directly, customers can conduct financial transactions using their smartphones. In comparison to offline banking in a bank branch office, users could experience more risk and uncertainty as a result. During the epidemic year, more consumers started using contactless payments. However, the outcomes showed that perceived TR is the most significant factor in determining the intention to use (Türker et al., 2022). Therefore, researchers have determined to include TR as one of the study areas to investigate the relationships of all the variables with BI mobile intention.

3. Research Framework

Figure 1: Research Framework Based on Unified Theory of Acceptance and Use of Technology 2 (UTAUT 2)



The research hypothesis based on the diagram of the UTAUT 2 model in the context of QR Code are:
H_1: Performance Expectancy (PE) is significantly affecting the Behavioral Intention (BI) to use mobile payment based on QR codes.
H_2: Effort Expectancy (EE) is significantly affecting the Behavioral Intention (BI) to use mobile payment based on QR codes.
H_3: Hedonic Motivation (HM) is significantly affecting the Behavioral Intention (BI) to use mobile payment based on QR code.
H_4: Habit (H) is significantly affecting the Behavioral Intention (BI) to use mobile payment based on QR code.
H_5: Trust (TR) is significantly affecting the Behavioral Intention (BI) to use mobile payment based on QR codes.

3. Methodology

Variables and Measurement: The research model incorporates six variables: behavioral intention (BI), performance expectancy (PE), effort expectancy (EE), hedonic motivation (HM), habit (H), and trust (TR). The foundation of this study is built upon the Unified Theory of Acceptance and Use of Technology 2 (UTAUT 2), as introduced by Venkatesh et al. (2012). This framework significantly influenced the formation of the survey utilized in the research. Measurement items were assessed using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), to gauge the level of agreement. In the preliminary phase, thirty (30) questionnaires were disseminated to selected participants to collect their insights and recommendations. The feedback obtained was analyzed with the Statistical Package for the Social Sciences (SPSS) Statistics 26 software. Based on the feedback received, the questionnaire was refined to enhance its clarity and ease of understanding for the participants.

Reliability Test: Before gathering data, the researcher must conduct content validity checks and a pilot study on the survey items within this research framework to assess their validity for measurement. The questionnaire, inspired by Venkatesh et al. (2012) and their introduction of the UTAUT 2 theory, has been adapted to align with the specific aims of this study. To test for reliability, a pilot study was carried out with 30 participants using IBM SPSS Statistics 26. The outcomes of the internal consistency reliability are presented in Table 2 below.

Table 1: Internal Consistency Reliability

Items	Cronbach's Alpha	Number of Items
Performance Expectancy (PE)	0.976	4
Effort Expectancy (EE)	0.947	4
Hedonic Motivation (HM)	0.924	4
Habit (H)	0.876	4
Trust (TR)	0.942	4
Behavioral Intention (BI)	0.923	4

Uma Sekaran and Bougie (2020) delineate that reliability scores ranging from 0.70 to 0.80 are deemed acceptable, scores above 0.80 are viewed as good, and those under 0.60 are typically classified as poor. The Cronbach's alpha reliability scores obtained are 0.976 for PE, 0.947 for EE, 0.924 for HM, 0.876 for H, 0.942 for TR, and 0.923 for BI. These findings indicate a high level of dependability, demonstrating that each item is both reliable and valid for inclusion in the questionnaire.

Data Collection: The researcher examines the research model by distributing 215 online questionnaires through Google Forms which distributed around the southern region of Malaysia by respondents with various backgrounds. The questionnaire outcome was examined by using Statistical Package for Social Science (SPSS).

4. Results and Discussion

Demographic Profile: The demographic data for the 215 participants in this study are shown in Table 3 below. According to the survey, 170 respondents, or 79.1% of the total, were female, while 45 respondents, or 20.9%, were male. The respondents are primarily between the ages of 19 - 30 (139, or 64.7%), and 123 of the total respondents (out of 215) are students. While the average age of the other respondents is between 41-50

(18.1%), between 31-40 is 33 (15.3%), between 61 and above there are 3 (1.40%), and between 51-60, there is just one (0.50%). 207 of the respondents (96.3%) have graduated from university or are currently enrolled in a university, and for primary and high school each respondent represents 4 (1.9%). Most of the respondents were a student (123 or 57.2%), followed by government servants (46 or 21.4%), private (26 or 12.1%), self-employed (6 or 2.8%), housewife represents 12 (5.6%) and 0.90% (2 respondents) are pension. The types of QR code payment applications that they used are DuitNow (175 respondents or 81.4%), MAE (127 or 59.1%), Touch n Go (125 or 58.1%), Grabpay which are 55 (25.6%), Boost (16 or 7.50%) and the least popular application is Alipay which only 3 respondents (1.40%). 86 respondents who are 40% used QR codes as their daily payment method, 77 (35.8%) used QR code payment weekly, monthly (25 or 11.6%), and 27 (12.6%) rarely used QR code payments. QR code payments are widely used to pay for food and beverage (181 or 84.2%), physical shopping (174 or 80.9%), online shopping (165 or 76.7%), 97 of respondents (47.1%) used QR code pay for entertainment such as at cinema or karaoke and 86 (40%) for bill payments.

Table 2: Demographic Profile

Measure	Items	Frequency	Percentage
Gender	Male	45	20.9
	Female	170	79.1
Age	19-30	139	64.7
	31-40	33	15.3
	41-50	39	18.1
	51-60	1	0.50
	61 years >	3	1.40
Education Level	Primary	4	1.90
	High School	4	1.90
	University	207	96.3
Job Sector	Government	46	21.4
	Private	26	12.1
	Self-employed	6	2.80
	Student	123	57.2
	Housewife	12	5.60
	Pension	2	0.90
Types of QR Code used	Grabpay	55	25.6
	Alipay	3	1.40
	Boost	16	7.40
	Touch n Go	125	58.1
	DuitNow	175	81.4
	MAE	127	59.1
Frequency use	Daily	86	40.0
	Weekly	77	35.8
	Monthly	25	11.6
	Rarely	27	12.6
Types of Payment used	Shopping	174	80.9
	Online Shopping	165	76.7
	Bill Payments	86	40.0
	Food & Beverages	181	84.2
	Entertainment	97	45.1

Hypothesis Analysis: Table 3 below displays the results of the assessment of the objectives and hypotheses of the study. To assess the strength of a relationship between two variables and their correlation, Pearson's correlation coefficient was used. A positive relation is demonstrated by the r-value between 0 and 1, and a significant relationship is indicated by a p-value of less than 0.05. These values will be used to analyze the results. The Unified Theory of Acceptance and Use of Technology (UTAUT)'s performance expectancy (PE), effort expectancy (EE), hedonic motivation (HM), habit (H), and trust (TR) were the factors that the correlation study looked at to determine the relationship between respondents' behavioral intention (BI) QR codes mobile payment. All five parts of the UTAUT are independent variables, whereas BI is a dependent variable. The

correlation coefficient (r-value) of 0.696** indicates a positive moderate relationship between performance expectancy (PE) and behavioral intention (BI). Any changes in PE are associated with corresponding changes in BI. This implies that as users' PE of using QR code mobile payments increases, their BI to use such payments also increases. Conversely, if their perceived benefits or effectiveness decrease, their intention to use the system is likely to decrease as well. The current finding was consistent with prior research by A. Rosli et al. (2020); Mohd Ariffin et al. (2020); Rasyidah & Ahd.Moess (2023); Nur & Panggabean (2021); Amarullah et al. (2021); Anggraini & and Rachmawati (2019); Alalwan et al. (2017); Do et al. (2020); found that BI has a positive influence on PE.

The perception of usefulness and the degree to which technology meets users' needs are fundamental drivers for the adoption and continued use of technological innovations, including QR code mobile payments. This concept is also grounded in the UTAUT, where perceived usefulness is identified as one of the primary factors influencing users' acceptance and usage behavior. A technology perceived as useful is one that users believe will enhance their job performance or make their lives easier in some way. This positive relationship is driven by users recognizing the utility and benefits of QR code payments, especially in terms of time savings and convenience. The faster transaction process, as facilitated by QR code technology, enhances the user experience, making it a preferable choice for completing transactions. This ease of use and the efficiency of QR code mobile payments contribute to its value from the users' perspective, fostering a positive perception of this payment method. Therefore, the results that have been reported support the H_1 as a result. Comparing effort expectancy (EE) and behavioral intention (BI), the correlation coefficient (r-value) is 0.660**, with a p-value of 0.000. This indicates that there is a moderately positive correlation between the two variables. Users are more likely to indicate that they want to use mobile payments using QR codes if they believe that using them would require more work. On the other hand, people are less likely to indicate that they plan to utilize it if they consider it to require less work. Muzaldin et al. (2022) found a negative relationship between EE and BI.

The results of this research are consistent with those of Wang & Yi (2012); Nur & Panggabean (2021); Leong et al. (2021); Yong et al. (2021); and Rosli et al. (2020), found a significant positive correlation between EE and BI. The perception that QR code mobile payments require less effort plays a crucial role in their adoption by consumers. This aligns with several theories and models in technology adoption, most notably the UTAUT, which identifies EE as one of the key determinants of technology adoption. When users believe that a technology is easy to use and will help to reduce their effort in accomplishing a task, they are more likely to adopt and use it. However, when users recognize and appreciate the ease of learning, using, and becoming proficient with QR code mobile payments that highlight the system's user-friendly nature and the effectiveness of its instructions, they do not consider ease of use as a critical factor driving their intention to use this payment method. Hence, H_2 for this study is supported. Hedonic motivation (HM) and behavioral intention (BI) have a positive, strong relationship, as indicated by the correlation coefficient (r-value) of 0.772**. Any changes to HM are followed by related changes to BI. It is anticipated that BI will rise in response to an increase in HM and fall in response to a decrease in HM.

Amarullah et al. (2021) in their research found that BI has no influence on QR code use among Jabodetabek respondents because they already used QR codes before in the sector. Ventakesh et al. (2012) stated that when consumers gain greater knowledge, they will find it more difficult to find novelty that supports the hedonic motivation effect on technology use. Instead, they will utilize technology for more practical goals like increasing productivity or reach. The more experience one gains, the less of an impact hedonic motivation will have on their usage of technology. However, this finding is relevant to prior research conducted by Rosli et al. (2020); Alalwan et al. (2017); Anggraini & and Rachmawati (2019); Hariyanti et al. (2020); Iskandar et al. (2020) and Muzaldin et al. (2022) discovered that HM has a positive significant relationship with BI When users find a technology not only easy and efficient but also enjoyable to use, it enhances their overall satisfaction and increases their likelihood of continued use. In the context of QR code payments, factors contributing to this pleasure might include the simplicity of scanning a code, the quickness of transactions, the novelty of the method, and the perceived innovation and modernity. Additionally, personalized experiences or rewards linked to the use of QR codes can amplify these positive feelings. As a result, H_3 has been accepted for this study.

According to Ventakesh et al. (2012), habit either directly influences how much technology is used or reduces the strength of the correlation between technology use and behavioral intention. Comparing habit (H) and

behavioral intention (BI), the correlation coefficient (r-value) is 0.801**, with a p-value of 0.000. This indicates that there is a strong positive correlation between the two variables. This result is consistent with Baptista & Oliveira's (2015) research on mobile banking use behavior in African countries which stated the positive relationship of H with BI; Tiara Imani & Herlanto Anggono (2020) found that H is the most significant factor influencing BI among Gen Z in Bandung; Thu Nguyen et al. (2020) discover H is one of the significant and positive factors influence the QR codes intention use in Vietnam; Sharif & Raza (2017) showed that H and BI significantly and positively influence university students' intentions to use Internet banking in developing countries; Rosli et al. (2020) in their findings showed that H has a positive impact on user BI; and Putranto (2020) indicates that one of the factors influencing people's intents to use mobile banking is a habit. These research findings indicated that QR code payments offer several advantages that contribute to this habituation, including convenience, speed, and often enhanced security features. They eliminate the need for carrying physical wallets or entering payment information manually, making transactions smoother and faster.

This efficiency, combined with the increasing ubiquity of QR codes in various payment contexts that can be used from restaurants and retail stores to utility bills and online purchases can encourage repeated use. Therefore, H_4 is supported. Due to environmental unpredictability and a feeling of losing control, users of electronic financial transactions are more vulnerable to risk. Trust (TR), which is defined as the subjective confidence that a party will fulfill their obligations, is vital (Patil et al., 2020). The correlation coefficient (r-value) of 0.834** shows a positive, significant relationship between trust (TR) and behavioral intention (BI). Any modifications to TR are accompanied by corresponding BI changes. When consumers trust that a technology will work smoothly, accurately, and securely whenever they need it, their confidence in using the technology naturally increases. This confidence, in turn, fosters a positive attitude towards the technology, which is crucial for its adoption and continued use. Imani & Herlanto (2020) in their research among Gen-Z in Bandung reveal that TR has no significant relationship with BI to use QR codes due to the market being saturated with various mobile payment systems, users might perceive the switching costs between different platforms as low. This abundance of choice means that trust in a particular technology does not solely dictate their willingness to use it.

As they can easily switch to another option if their expectations are not met. However, this research finding is in line with the research (Nur & Panggabean, (2021); Muzaldin et al. (2022); Mangalam et al. (2022); Lim, 2020; Jung et al. (2020); Liu & Tai (2016); Alalwan et al. (2017); Amarullah et al. (2021); Anggraini & and Rachmawati (2019); Rosli et al. (2020); Sharif & Raza (2017); Slade et al. (2015); and Yong et al. (2021)). Users' perceptions of QR code mobile payments as reliable, secure, and trustworthy are central to their willingness to adopt and use this technology. When users believe that the system works consistently, protects their financial and personal information, and operates in a trustworthy manner, they are more likely to use it for transactions. The belief in the honesty and integrity of mobile payment service providers reinforces users' confidence in QR code payment systems. This confidence is crucial because it implies that users trust the providers to handle their transactions and data responsibly and to act in the users' best interests. Thus, H_5 is accepted.

Table 3: Result of Pearson Correlation Coefficient

Hypotheses	Pearson Correlation (R-value)	Significant Level (p-value)	Remarks
H_1: Performance Expectancy (PE) is significantly affecting the Behavioral Intention (BI) to use mobile payment based on QR codes.	0.696**	0.000	Supported
H_2: Effort Expectancy (EE) is significantly affecting the Behavioral Intention (BI) to use mobile payment based on QR codes.	0.660**	0.000	Supported
H_3: Hedonic Motivation (HM) is significantly affecting the Behavioral Intention (BI) to use mobile payment based on QR code.	0.772**	0.000	Supported
H_4: Habit (H) is significantly affecting the Behavioral Intention (BI) to use mobile payment based on QR code.	0.801**	0.000	Supported

H_5: Trust (TR) is significantly affecting the Behavioral Intention (BI) to use mobile payment based on QR codes.	0.834**	0.000	Supported

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

Table 4: Indicator for Pearson Correlation Analysis (Sekaran, 2013)

Coefficient Size	Strength of the Relationship
0.91-1.00	Very strong
0.71-0.90	Strong
0.41-0.70	Moderate
0.21-0.40	Weak
0-0.20	Very Weak

Regression Analysis: The analysis in Table 5 below provides insightful data on how different factors from the Unified Theory of Acceptance and Use of Technology (UTAUT) model influence the Behavioral Intention (BI) to use QR code applications. With an R^2 value of 0.782, it explains a significant portion (78.2%) of the variance in BI, which is a strong indicator of predictive power concerning the factors affecting the intention to use QR codes. Performance expectancy (PE), Hedonic Motivation (HM), Habit (H), and Trust (TR) were found to be significant predictors of BI using QR codes, whereas Effort Expectancy (EE) was not identified as a significant factor in this analysis. TR shows the highest beta coefficient (β = 0.408) with a p-value of 0.000 which means a 1% increase in TR results, and BI of the QR codes will increase by 40.8%. The results indicate TR is the strongest and statistically significant predictor among the factors considered. This suggests that the degree of trust users place in QR code applications greatly influences the respondent's intention to use such technology. H also shows a significant beta coefficient (β = 0.258) with a p-value of 0.008, highlighting its importance. This indicates that the more accustomed users are to using QR codes in their daily routines, the more likely they are to continue using them.

PE, with a beta coefficient of 0.254, although showing a statistically non-significant p-value (p=0.481), is suggested to have a practical influence on BI, based on the interpretation that a 1% increase in PE results in a 25.4% increase in BI toward using QR codes. This could be an indication of the perceived benefits and effectiveness of using QR code technology in enhancing transactions or activities. HM, with a beta coefficient of 0.155 and a p-value of 0.116, though not statistically significant at conventional levels, suggests that the enjoyment or pleasure derived from using QR code technology has a positive but less substantial effect on BI compared to the other factors. While all these components of the UTAUT model play roles to varying degrees, TR emerges as the most critical determinant in this context, followed by H and PE. It suggests that ensuring the reliability and security of QR code applications, along with highlighting their practical benefits and integrating their use into daily habits, could be key strategies for promoting wider adoption among users.

Table 5: Multiple Linear Regression for Behavioral Intention of QR Codes Mobile Payments

Variable	Standard Coefficients Beta (β)	t	p-value
Performance Expectancy (PE)	0.254	4.697	0.481
Effort Expectancy (EE)	-0.092	-1.576	0.000
Hedonic Motivation (HM)	0.155	2.670	0.116
Habit (H)	0.258	4.152	0.008
Trust (TR)	0.408	6.688	0.000

Note: Dependent Variable: Behavioral intention (BI), $p<0.001$, $R^2=0.782$, $\Delta R^2=0.777$

5. Discussion and Conclusion

The investigation into the adoption of QR code applications has highlighted the pivotal role played by five key factors derived from the Unified Theory of Acceptance and Use of Technology (UTAUT) model. These factors namely performance expectancy (PE), effort expectancy (EE), hedonic motivation (HM), habit (H), and trust (TR) have been found to significantly influence respondents' behavioral intentions towards using QR code applications. This correlation indicates that users are more inclined to adopt and continue using QR codes if

they perceive the technology as beneficial and easy to use (performance and effort expectancy), enjoyable (hedonic motivation), trust the platform's security and reliability, and have integrated its use into their daily routines (habit). The positive correlation of these factors with behavioral intention underscores the necessity for developers and marketers to focus on enhancing the user experience, ensuring ease of use, delivering enjoyable interactions, and building a trustworthy environment. By doing so, they can effectively encourage broader acceptance and sustained use of QR code technology. This study's findings provide crucial insights for the strategic development and promotion of QR code applications, emphasizing the need to address these key user concerns and preferences to increase adoption rates. The regression analysis undertaken in this study reveals that TR emerges as the most critical determinant influencing consumers' intentions to adopt mobile payments via QR code technology.

This paramount trust surpasses the influences of other significant factors identified, including PE, EE, HM, and H. The findings reveal that for consumers, the assurance of the security, privacy, and reliability of the mobile payment system is paramount. In an era where digital transactions are fraught with concerns over data breaches and fraud, TR in the QR code payment platform's ability to protect user information and provide a secure transaction environment is crucial for adoption. While PE, EE, HM, and H undoubtedly play essential roles in shaping consumer behavior towards QR code payment adoption, they are secondary to the foundational requirement of trust. This insight is instrumental for stakeholders in the mobile payment ecosystem, highlighting the necessity to prioritize building and maintaining trust as a cornerstone for encouraging the widespread use of QR code technology for payments. Focusing efforts on enhancing security features, transparent practices, and reliable services will be key in winning consumer confidence and driving the adoption of QR code payment solutions. In summary, while QR code applications hold significant potential for diverse uses in Malaysia, their success hinges on overcoming challenges related to trust, awareness, and infrastructure. With concerted efforts from all stakeholders, QR code technology can achieve higher adoption rates, offering convenience and efficiency for users across the country.

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Supply Chain Limitations in the South African Engineering Sector-Supply Chain Professionals Views

Kansilembo Aliamutu & Msizi Mkhize*
Department of Financial Accounting, School of Accounting, Economics and Finance,
University of KwaZulu Natal, South Africa
mkhizem4@ukzn.ac.za, *freddyali6@gmail.com

Abstract: The engineering industry has several obstacles as the worldwide economy slows, including macroeconomic hardship, lack of resources, organizational deficiencies, and an overall incapacity to respond to major concerns. In the past few years, they have gotten increasingly intense and serious. Empirical supply chain administration studies identify impediments that hinder the engineering industry in emerging nations, such as South Africa. This research aims to investigate supply chain limitations in the South African engineering industry. The literature was evaluated as well as interviews that were semi-structured and were used to get thoughts from 15 senior supply chain professionals. To examine qualitative data, ATLAS.ti (version 7) software was used for content analysis. The conversations revealed six topics, such as a shortage of capital in supply chains, innovative supply chain process restrictions, supply chain administration changes, supply chain cooperation, supply chain administration, and scheduling administration. engineering companies should use systems to manage their supply chains, integrated options, and collaboration managing project techniques and technology. The findings reveal a shortage of expenditure in supply management processes and the fact that engineering companies are still lacking a strategic perspective on managing their supply chains. However, it seems that supply chain tactics may improve an organization's efficiency and business performance in engineering companies.

Keywords: *Supply chain limitations, engineering sector, supply chain professionals.*

1. Introduction

Despite the reality that the engineering sector has been in a depression since 2009, it continues to be one of South Africa's major businesses, providing considerably to job creation and economic development, Loosemore et al. (2020). In the opinion of Sibanda et al. (2020), the ongoing worldwide crisis has had an especially severe effect on the engineering industry. Hence, the engineering sector provides a large amount of gross domestic product (GDP) in several nations, with certain projections ranging from 6% to 9% of GDP in developing nations (Othman et al., 2021). Throughout 2008 and 2016, the engineering sector employed around 1.4 million individuals and contributed to approximately 8% of total official labor and 9.6% of the average GDP in South Africa (Engineering Sector Improvement Board (CIDB)). However, in the opinion of Emrouznejad et al. (2023), the engineering sector is still plagued by disintegration, ineffectiveness, overruns of costs and timelines, and other issues. In reducing economies worldwide, the engineering sector encounters an assortment of difficulties, including economic status seems to anxiety, lack of resources, organizational shortcomings, and an overall failure to address major problems, with these difficulties enhancing and becoming more prevalent in recent years (Bag et al., 2022). Not unexpectedly, regulators and scholars together are searching to gain greater awareness of the construction sector's hurdles and limits, both at the socioeconomic and organizational levels.

Moshood et al. (2021) stated in this respect that scientific study remained an essential channel for the formation of new viewpoints. Because the efficiency of supply chains is frequently favorably connected with company success, a knowledge of the limits below its connected issues is required if the efficiency of the sector is to be addressed. Bag et al. (2020b) discovered that various problems experienced in major construction initiatives are caused by a shortage of appropriate collaboration in the supply chain both within and among supply chain participants. Development interruptions, price increases, and deviations in quality, which result in unsuccessful projects and disgruntled clients, are all prevalent difficulties in the construction sector (Mafini et al., 2020). In addition, there is a widespread belief that the undertaking execution procedure in construction administration is expensive compared to other industries like production as well as retailing. Dahooie et al. (2020) observed that the importance of these inadequacies within the sector is heightened by schedule and cost delays. Eliminating these shortcomings causes the use of supply chain administration. even though a variety of research initiatives from several nations are currently examining different facets of the supply chain

administration arena in the engineering sector, there are currently a few research investigations that explore the limitations of supply chains in the construction sector (Talwar et al., 2021).

Investigations into science concentrating on the engineering sector, based in Pournader et al. (2021), remained an essential route for the production of such fresh viewpoints. Supply chain management synchronizes important company functions and operations to meet the demands of clients. These comprise the initial exploitation of raw materials for the ultimate client, as well as intermediary interpreting, shipping, and warehousing operations, as well as the final delivery to the ultimate consumer (Menon and Ravi, 2021). Based on Taddei et al. (2022), supply networks differ in length, width, and amount of intricacy; and a company that manufactures many different kinds of goods is obligated to be a member of several supply chains, based on the resources and services utilized for producing and distributing those goods. The cornerstone of supply chain administration is that it is tactical in its very nature, with the production of value for clients being a primary driver of the whole supply chain operation (Ambe, 2016). Recognizing this truth frequently necessitates a considerable adjustment in the members' attitude towards collaborating, working together, and mutual advantages. It is not shocking that just a few sophisticated uses in the engineering sector have been described (Bizana et al., 2015). Luo et al. (2020) has noted that, compared to never previously, construction endeavors appear to be developing relationships of cooperation among major workers, subcontractors, and providers, albeit slowly.

Based on Menon and Ravi (2021) a cooperative arrangement in purchasing is still not commonly adopted, in which enterprises profit jointly by decreasing costs and inventories, and the consumer benefits as a result by receiving the highest possible value for money. Because there is no single purchasing approach that functions optimally for all building circumstances, a thorough examination of customer requirements is essential before applying a purchasing approach. Taddei et al. (2022) contends that effective procurement techniques are essential to lower total expenses, improve the overall financial effectiveness of the engineering sector, and guarantee that initiatives are suitable for use when completed. Procurement is one of the areas with the most prospects for lowering expenses and increasing the worth of every link in the supply chain (Wieland, 2021). According to Khan et al. (2021), the benefit of optimizing the complete supply chain is unable to be realized without the procedures involved with the beginning and middle, along with the downstream transportation of knowledge, tangible goods, and products from various pathways to final users. Because monitoring the constantly changing connections and exchanges that occur between suppliers may grow complicated, successful project incorporation into the wider structure of supply chain administration is required.

For example, considering the vital function of subcontractors in engineering initiatives, any increase in overall efficiency necessitates acknowledging the reality that the main supplier must rely on the dependability of subcontractors for the completion of the task (Ramos, 2004). Bag et al. (2020a) argue that prompt subcontractor participation and incorporation necessitate prompt procurement by subcontractors, and their choice ought to be determined by standards including inventiveness, capacity to work together, and position of the strategic goals with the primary metrics discovered for the work, rather than simply the cheapest rate. The role of logistics in managing projects gets somewhat more difficult when large amounts of supplies, parts, tools, and other supplies are needed for engineering. According to Bag et al. (2021), every component congregates at the building site, where the structure is constructed from arriving materials and initiatives needing customized supply chains, with every endeavor resulting in the creation of a fresh facility. This necessitates a deep grasp of customer needs, as well as a reduction of trash across the supply chain to save costs and ensure that the project is completed and delivered on time. Zekhnini et al. (2022) emphasizes the significance of logistics, claiming that hardly any emphasis has been devoted to supply chain management (SCM) or transportation, with the engineering industry only seeing the last stage of the delivery process as particularly vital.

Bag et al. (2021) further claim that, although there have been advancements in ICT systems, little effort is being made to comprehensive assessments before adoption. This means that optimizing transport vehicle utilization can considerably enhance engineering effectiveness. Furthermore, because materials contribute about 55%-60% of overall building costs, productive and effective control of inventory is critical to completing effective building endeavors. Because of inefficient product storage and transportation on the building site, it can be challenging to monitor and find supplies precisely when they are required (Dobroszek, 2020). The

administration of materials is concerned with the regular flow of supplies. Again, inadequate engineering supply processing and administration have an impact on the overall success of engineering initiatives in terms of schedule, price (expense), effectiveness, and efficiency (Helo and Hao, 2022). Material waste in engineering activities may end up in significant financial losses as well as negative effects on wellness and the natural world (Selomo and Govender, 2016). One issue related to managing inventory for engineering initiatives is a shortage of or unfinished current knowledge concerning on-site supplies, and based on Bag et al. (2021) the introduction of innovations that include bar codes for substance monitoring and tracking across engineering initiatives will merely simplify and enhance live inventory control procedures.

The transient project-oriented structure of building projects appears to impede engineering supply chain convergence (Turker and Altuntas, 2014). Furthermore, Menon and Ravi (2021) noted that because supply chains for engineering are extremely volatile in the sense that organizational structures and teams of contractors shift often, it is not probable that the initiative subjects will have the opportunity to establish enough confidence and freely disclose knowledge. However, as noted by Seuring et al. (2019) enterprises rely on their supply networks to live and prosper since each company is involved in one or more logistics networks. Matto (2017) argue that while understanding the present functioning conditions and interrelationships between the different aspects of the supply chain structure is vital, it is equally crucial for pursuing improving the efficiency of specific manufacturing procedures inside the supply chain. Menon and Ravi (2021) suggests that the major reasons for limits or obstacles in the context of supply concerns be identified. As a result, the present research was simultaneously pertinent and noteworthy in that it aimed to investigate supply chain limitations in the South African engineering industry which will lead to the sector's improved performance.

2. Research Methodology

This research employed an exploratory qualitative research design, which allows for in-depth knowledge of the circumstances and is employed when a scholar investigates an emerging field or when the topic of inquiry is fairly fresh and unexplored, based on Pandey and Pandey (2021). In the present research, individuals were chosen via purposeful sampling. Purposive sampling, which entails locating and choosing persons with an understanding or expertise concerning a topic under examination, was utilized in the present research, as per Mishra and Alok (2022). The author's knowledge and understanding of the South African engineering sector permitted and allowed relatively straightforward accessibility to top management and prominent participants in the research, particularly chief procurement managers. Those in attendance were top executives from engineering companies. Therefore, fifteen (15) contributors were chosen from engineering company employees. Semi-structured interviews were carried out. The responses from the respondents' profiles are shown in Table 1.

Table 1: Profile of those who participated.

Respondent Coding	Position Controlled	Years	Engineering Sector Location
R1	Transportation Supervisor	14	Gauteng
R2	Procurement Analyst	12	Kwazulu natal
R3	Product Supervisor	13	North West
R4	Senior purchaser	10	Western Cape
R5	Procurement Manager	14	Gauteng
R6	Procurement Analyst	12	Mpumalanga
R7	Regional purchaser	12	Easter cape
R8	Senior Procurement Manager	23	Gauteng
R9	commodities trader	12	Easter Cape
R10	Senior Procurement Manager	27	Limpopo
R11	Activities Supervisor	16	Limpopo
R12	Manager of Purchasing	15	Western Cape
R13	Procurement Manager	19	Free state
R14	Senior purchaser	11	Gauteng
R15	Establish and resource management	22	Mpumalanga

Based on Eton et al. (2018), semi-structured interviews refer to a variety of distinct types of interviews that are distinguished by their adaptable and dynamic structure. A digital recording device was used to record the interviews. The transcribing procedure required close observation of data via continuous attentiveness (and looking), and it was a critical initial step in data processing. Recording, as an interpretative activity instead of a technical method, may contribute to the discovery of unexpected occurrences (Gold and Heikkurinen, 2018). Trustworthiness, as defined by Queiroz et al. (2023), comprises the validity and credibility of the data presented to an inquirer and is composed of four components: credibility, conformability, transferability, and dependability. The triangulation approach was used to determine trustworthiness in the present research. Triangulation is a strategy of increasing validity by approaching the problem from several perspectives, such as diverse methods or analysis methodologies. It also has the potential to improve data collection's complexity (Lauwo et al., 2022). When the investigator was engaged with those who took part throughout the conversation preparation phase and after the interviews were completed, member verification was used to collect any additional information from written critiques and compliments (Sibanda, 2017).

To establish confirmability, a verification record was created for every conversation by allowing respondents to see their transcripts of the interviews. ATLAS.ti (version 7) software for analyzing qualitative data, particularly huge portions of written, visually appealing, and audio information, was utilized for content analysis (Mastos et al., 2021). ATLAS.ti (version 7) software for assessing qualitative data, particularly huge portions of written, visually appealing, and audio information, was utilized for content analysis. Given the volume of written information collected from the interviews, implementing ATLAS.ti is acceptable for this investigation (Selomo and Govender, 2016). A three-step approach proposed by Nkwanyana and Agbenyegah (2020) was adhered to while utilizing this program. The initial step was to find recurring groups that provided the data significance. The coding technique was then developed, which involves the researcher attaching labels to areas of the data based on interpretations determined by the data. After all the data had been sorted and processed, comparable sentences were placed into the same categories. The interviewer documented the themes that emerged from the coding. This technique was continued until the saturation threshold was achieved, at which time themes recurred frequently, suggesting that no more studies were required. The collected themes reflected the research's main results.

3. Results and Discussion

The current analysis revealed a few obstacles that the sector has to conquer. They involve a shortage of supply chain investment, procedural restrictions in supply chain inventiveness, supply chain change administration, supply chain cooperation, supply chain administration, and time of administration.

Theme 1: The Shortage of Investment in Supply Chain Systems: The research's first topic was named as such because the responses of participants revealed a widespread lack of investment in logistics administration systems. In answer to whether the business has an approach established to identify and handle supply chain limitations, the subsequent replies were got from individuals, marked by the letter P:

'Our firm lacks a suitable system. They signed a contract for an excellent supply chain structure, largely installed it, and then terminated the agreement before enjoying any of the benefits it provided (Respondent 1 (R1)). A product administrator and a senior purchaser addressed themselves in regard to this in this manner: 'We utilize Build smart because it's supposed to be an excellent system. According to the documentation from headquarters, it is an initiative tool for administration and not for procurement. I just utilize the structure as is, and I have no idea who changes what to it. (Respondent 3 (R3); we have a purchasing system and around eight (8) systems throughout the organization. We prefer to consolidate procurement data into a single centralized accounting system; however, this is challenging since we only have provider expenditure, not product expenditure (R4)'.

These comments indicate that engineering businesses have been hesitant about investing in, or even fully utilizing, supply chain administration technologies that could allow them to simplify procedures to save time and money. The shortage of expenditure in supply management processes illustrates the fact that engineering companies are still lacking a strategic perspective of managing their supply chains, as it appears that there is an overall lack of understanding of how supply chain tactics may improve an organization's efficiency and

business performance. In certain circumstances, it seems that every aspect of the purchasing department lacks an organizational strategy within some companies, resulting in subpar procurement processes. Nzimakwe and Biyela (2021) discovered that, in comparison to other sectors, the engineering sector in South Africa is somewhat tardy in adopting supply chain administration systems and other kinds of standards of excellence. Critical functions such as expenditure analysis and strategic purchasing are perpetually hindered in the absence of an adequate supply chain administration system. Adopting best practices will require engineering companies to accept the supply chain administration concepts and apply them.

Theme 2: Processes Limitations in Supply Chain Inventiveness: The research's theme 2 was dubbed "lack of a supply chain inventiveness strategy." The subject evolved as a result of subsequent replies from respondents. According to procurement analysts: 'In my opinion, this sector is stuck at a point in time, having not embraced excellent company procedures and concepts, and continuing to do the same things repeatedly while expecting outcomes that vary. I came on board at the peak of the conspiracy scandal. The 'free meals and high profits were finished,' but the corporation neglected to loosen its belt and prioritize the fundamental cost factors to be competitive successfully (R2). 'The sector is typified by the same important people going from one business to the next - fresh faces, thus innovative thinking isn't occurring on an ongoing basis,' he continued.

Lastly, the commodity's manager answered: "There's nothing that has radically shifted in my experience during the past 10 strange years." They continue to do the same activities over and over again (R4). The industry is unwilling to invest in costly supply chain technologies until it understands how supply chain tactics may improve an organization's efficiency and competitiveness. Engineering will struggle to shift to excellent best practices unless it recognizes that supply chains contain more than simply buying functions. Procurement systems remained unsatisfactory (C) because even the purchasing function lacks an organizational strategy in certain businesses. Mafini (2016) have also noted the engineering sector's hesitation to devote its assets, both monetary and time-dependent, to innovations. He claims that if engineering companies took invention seriously enough, it would immediately improve the entire procedure for managing projects and result in the formation of more skilled and efficient employees.

Theme 3: Supply Chain Change Administration: The research's third theme was dubbed "a shortage or supply chain change administration." "A few of these initiatives had the aim of ensuring every aspect of the supply chain reported to a focused resulting structure, carrying out fresh procedures (agreements abandoned), and additionally carrying out excellent procedures by all functioning operations," said one respondent. The strategy additionally underperformed because it caused system and procedure modifications, and while the corporation invested money in determining the issues in its present procedures, it declined to invest cash in correcting them (R6)'. 'Regarding corporate abilities, company processes, and work experience not related to engineering, as well as the capacity to adopt fresh ideas, engineering is inexperienced (R13)'. Shift administration is definitely an issue in the industry, and opposition to transformation is rampant in certain businesses. This is because of past habits and managerial methods that the industry is unwilling to change. Because of established and long-serving executives' insufficient knowledge about excellent managerial ideas and procedures, specifically supply chain improvements throughout the last decades, most long-serving workers will be unfamiliar with these new methods.

Conventional change administration approaches are intentionally designed to fail or be fought until they are abandoned. As a result, a stricter approach to enforcing transformation is necessary in the industry and certain companies. Also, provided the importance of the limitations noticed, it is additionally essential to note that whereas the shift is beneficial, if not controlled correctly via an established change administration procedure, it could have an enormous effect as it interferes with the job and influences its smooth cycle, negatively affecting efficiency and resulting in timetable interruptions and expense excesses. In addition, change administration continues inefficient since most of these processes appear to be missing. Although Dlova and Nzewi (2014) understand that establishing a successful engineering change administration procedure is difficult to accomplish because of the causes of a comprehensive remedy, they contend that an integrated modification administration system causes help in technology from various technologies, such as working together on project administration technologies and instruments.

Theme 4: Supply Chain Cooperation: Theme 4 arising from the research was marked "a shortage or lack of supply chain cooperation'. This trend arose from the local consumer and senior purchasing officer's comments as follows: 'There are three distinct supply chain/ purchasing structures in our business - the first is the strategic purchasing split produced up of highly capable, helpful purchasing professionals and commodities supervisors submitting to the corporate level as a service department to the whole organization. The second type of purchaser is the practical consumer, who reports to every company division and is primarily managerial. They are constructed of people who are inadequately educated or equipped and have 10 to 20 years of experience. They are usually clerks who 'become purchasers'. Engineering, statisticians, construction employees, marketing and agreements management make up the third group, and they hire subordinates and choose providers for highly valuable goods in bulk. This serves to veil the supply chain because weak systems obscure rules, procedures, activities, requests, and suppliers (R7).

'This is problematic because there is a perpetual conflict between activities, consumers, and strategic purchasing. Lacking a solid foundation, everything we try hits a brick wall. I believe that 50% of strategic purchasing activities were lost because purchasers disregarded suggestions (R10). Several participants expressed unwillingness to work together and share knowledge with their colleagues. Respondents showed that collaborating cooperatively on pre-qualifying current supply chains might minimize the total time required for evaluating the skills of providers and contractors. As a result, the purchasing industry may concentrate its attention on the official tendering procedure and getting the greatest value. Particularly as the engineering sector grows in South Africa, there currently must be a greater amount of time accessible for concentrating on developed supply chain administration, getting lasting connections, expressing hazards and possibilities, and revealing inventiveness to deliver the most effective options for customers and other interested parties.

Maramura and Shava (2021), said that trust between organizations is critical in retaining a competitive edge inside the supply chain. When confidence is built via interactions among persons, it develops a link or tie that binds individuals collectively. Binding may be classified into two types: architectural and interpersonal. Legal agreements and arrangements are examples of structuring connections, which are financial and political linkages that connect consumers with sellers. Sienkiewicz-Małyjurek and Szymczak (2023) said that as defective as each of the components of a building supply chain are, they are made considerably more difficult since a new supply chain or management element must be built every single time a fresh endeavor begins. The modifications that take place from one task to the following one avoid the education that occurs in production.

The Fifth Theme: Supply Chain Management: The research's sixth topic was branded "lack of supply chain management." This topic evolved as a result of the items that followed replies from those who participated: *Management and public encouragement of supply chain activities, as well as addressing compliance clearly (P1)'. 'A shortage of organizational support and knowledge regarding what we do. In this firm, regardless of how competent or skilled a worker is, we are treated as second-class people, despite just agreements' management, QS's, engineers, and so on being acknowledged. Titles are important in this firm (R5). In addition, respondents noted that senior executives from enterprises engaged in an endeavor seldom agree on common goals. It was discovered that difficulties are not always handled at the point of happening, and collaborators on the project do not adopt transparent pricing. Respondents observed that 'reinventing' the design of previous errors was not prevented, and learning learned was not utilized. Program outcomes are inconsistent, and no official or unofficial evaluations of achievements are done.

A recognized edge in competition is meaningless if the engineering business cannot preserve it from project to project, therefore engineering sector executives must maintain a core attitude of anticipating (rather than responding) to developments and challenges (Sienkiewicz-Małyjurek and Szymczak, 2023). Recognizing that the majority of important gains are the outcome of little adjustments as time passes the engineering sector needs to promote a culture of continual projects and process (such as job technique) development. Training for workers and motivation is required, as these tiny improvements will be more successful if the labor force is of high quality. The results further demonstrate that the introduction of management-based approaches has resulted in no discernible positive influence on the engineering sector and might not provide a successful answer when managing supply chains. According to Pooe et al. (2015), management-based mindset might even be restraining the transition to a performance-oriented workplace. According to the study, leadership-based

approaches could prove more profitable. Leadership-based approaches additionally involve based on data remedies, which reduce managerial decisions, administration, and outside influence while increasing guidance, autonomy, and cooperation.

The Sixth Theme: Managing Time: 'Time' was the research's sixth and concluding theme. This topic evolved as a result of a couple of replies from those who participated: 'Time is a problem that isn't perpetually present because when you have an undertaking, there are a lot of events that must take place when you do the beginning. So timing is a barrier, but if you currently have your procedures as well as location information, there is no explanation why it can't operate greater (R2)'. 'There isn't sufficient time for the estimations or estimate teams to adequately prepare the offer inquiries documentation. So, whenever you, as the QS, ultimately obtain the subcontractor papers, you must conduct conversations or interact with the subcontractor for the purpose to finish the agreement (R5). 'As a result, I believe that the time necessary to prepare a suitable offer or RFQ is frequently insufficient. So, from bidding to implementation, how long does it take? Notice that I believe that in terms of implementation, we are often guided by who is the lowest (R9)'. Efficient time administration is critical in building projects. Nyide (2022) goes on to say that interruptions are expensive and are particularly discussed in contract papers in expectation of assessed and other penalties. Engineering costings may include additional, agreed upon, or unit prices. As stated by Setino and Ambe (2016), all engineering costs are based on the time that the contractor estimates it will require to finish a task. Excluding any difficulties created by the task owners and beyond the provider's management, the subcontractor must fulfill the product proprietor's deadline or risk losing cash. Engineering time variables are much more problematic since workers may be outdoors for part or all of an endeavor, meaning their progress is impacted by weather-related factors.

4. Conclusion

This research concentrated on the supply chain limitations in the South African engineering sector. Because empirical research in this field is limited, particularly in South Africa, this research should offer a foundation for future regional studies aimed at improving the administration of supply chains and project efficiency in the engineering sector. Although the empirical research-based discussion on supply chain limitations concentrates primarily on the production and manufacturing contexts, the conversation on engineering continues primarily theoretically. The research looked into supply chain restrictions in the South African engineering sector. It commented on the important way that the engineering sector contributes to the South African economy in a variety of methods, including the development of required facilities for both personal and business purposes, its influence on GDP, and job opportunities, in both official and informal capacities. The literature regarding the characteristics of the nation's engineering sector, and also the relevance of supply chain administration to specific enterprises and the sector as an entire, was evaluated. The paper also described the qualitative research technique used for the research, following which the empirical results were published. Six significant themes emerged from the data analysis of the basic data gathered. The findings reveal a shortage of expenditure in supply management processes and the fact that engineering companies are still lacking a strategic perspective on managing their supply chains. However, it seems that supply chain tactics may improve an organization's efficiency and business performance in engineering companies. These findings were compared to pertinent previously published research to determine whether the results of the present research are consistent with the pertinent published literature.

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