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Editorial

Information Management and Business Review (IMBR) provides a digital forum for researchers to share their knowledge and publish research work in the fields of information management, business, management and related disciplines. The work submitted for publication consideration in IMBR should address empirical and theoretical developments in the subjects related to the scope of the journal in particular and allied theories and practices in general. Author(s) should declare that work submitted to the journal is original, not under consideration for publication by another journal and that all listed authors approve its submission to IMBR. It is IMBR policy to welcome submissions for consideration, which are original, and not under consideration for publication by another journal at the same time. Author (s) can submit: Research Paper, Conceptual Paper, Case Studies and Book Review. The current issue of IMBR is comprises papers of scholars from different universities of Malaysia, Indonesia, Oman and UK. Preferences of Student's Learning Method Based on Course, Gender and Age, Supply Chain Resilience in the Face of Floods, Factors Influencing Customers on the Use of E-Payment, Factors Affecting Consumer Responses to Influencer Marketing Campaigns, Exploring the Concept of Supply Chain Quotient, Optimizing Working Capital Management in Supply Chain Finance, Academic Perspectives on Open Government Data, Gig Economy: Current, Present and Future, Factors that Influenced Smartphone Purchases, Enhancing Export Delivery Performance, Investigating Factors Shaping Sunnah-Based Product Consumption, Forecasting Short-Term FTSE, Effect of False Advertising on Consumer Online Purchase Behavior, Islamic Human Resource Management Influence on Employee Turnover Intention, Graduate Employability Transfer of Training, Optimising Administrative Employees' Productivity, Succession Planning, Career Attitude and Job Security, Equitable and Sustainable Digital Agriculture, E-Wallet Payment Usage Among Young Consumers, Effectiveness of TikTok Marketing, Safety Management Systems Practices, Enhancing Supply Chain Efficiency, Bibliometric Examination of "Bona Vacantia", Enterprise Risk Management Practices in SMEs, Factors Influencing Tourists' Satisfaction on Electric Train Service and Social Media Usage as a Learning Tool on Students' Academic Performance 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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The Preferences of Student's Learning Method Based on Course, Gender and Age: Visual, Audio, Reading & Kinesthetic (VARK)

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Abstract: Different students have different preferences for learning methods. Some of the students might prefer visual or audio reading or kinesthetic learning. It is believed that the student's preferences of learning methods might help the students understand more about the subject and hence contribute to their academic performance. Therefore, this study investigates whether the students' preferences for learning methods are influenced by the courses they registered for and the gender, and age of the students. A sample of 341 students from different backgrounds was selected in this study comprised of students from the Faculty of Business and Management, Faculty of Accountancy, Faculty of Graphic Design, and Faculty of Nursing in Universiti Teknologi MARA (UiTM) Puncak Alam. The findings show that course and gender play an important role in student's preferences for learning methods while age is not the significant variable. There is a very high positive correlation between courses and preferences of learning methods, while age and gender have a high positive correlation toward preferences of learning methods. This study might help educators in tailoring their lectures to the students' preferences of learning methods, thus contributing to the academic performance of the students.

Keywords: *Learning method, Courses, Age, Gender, VARK, Academic Performance*

1. Introduction and Background

Each student's learning method might vary greatly depending on the sort of learning approach that is most comfortable for them to study effectively and efficiently (Benitez, 2023). Varied students have varied skills and passions when it comes to catching up on particular topics that must be covered in a specific amount of time. Some students may need to concentrate on the class while writing in their notebooks, but others may simply need to listen to lectures or cannot focus in class and study using their own way during their free time. The best approach that meets their preferences might be used as a strategy to plan their path to achievement.

Some students may be unaware of their learning method or the correct word for their learning approach. Some students may have varied origins, courses, genders, ages, experiences, and interests. Individual variations in cognitive, sensory, and emotional processing can impact how pupils approach learning (Grand Canyon University, 2020). The research on this issue will equip educators with knowledge that will allow them to modify their teaching approaches to suit the requirements of different students better. Some students might not maximize the contents of the subjects if the preferences of learning method are not suitable with them which results in bad grades for the subjects. Enhancing and acknowledging different types of learning methods in class might help the students gain interest in the subject.

The VARK model (Visual, Auditory, Reading/Writing, Kinesthetic), Kolb's Experiential Learning Theory, and Gardner's Multiple Intelligences are several learning methods theories. However, in this research, it will concentrate on the VARK model. Neil Fleming created the VARK model, which is frequently implemented in educational contexts to categorize learning preferences. The VARK model provides a comprehensive framework for examining individual variations in learning preferences, revealing how individuals receive and retain knowledge (Hussain, 2019).

Educators can design instructional tactics that correspond with varied preferences by recognizing the prevailing learning methods within a student group, enabling a more inclusive and engaging learning environment. This study adds to the continuing conversation about personalized education by attempting to bridge the gap between teaching approaches and individual learning methods, therefore optimizing educational results for students. Students are classified into four major learning methods according to the VARK model: visual, auditory, reading/writing, and kinesthetic. Understanding these preferences can have a big influence on instructional design and learning results. It emphasizes the link between learning methods and student involvement. When instructional approaches fit with students' chosen learning mode, they are more likely to engage in the learning process. Recognizing and adapting these various learning methods in the classroom promotes a more inclusive and productive learning environment.

Teachers can use a combination of these strategies to meet the diverse demands of their students and provide a well-rounded learning experience. Visual learners benefit from visual aids like charts, graphs, and diagrams. They like visually engaging information, such as photographs and movies. Presentations, mind maps, and multimedia resources are examples of educational techniques for visual learners. Auditory learners, on the other hand, learn best by listening and speaking. Not just that, they also gain from discussions, lectures, and audio-based materials, among other things. For auditory-oriented learners, discussions in groups, spoken explanations, and podcasts might improve their learning experience. Furthermore, they thrive with written words and text-based tools for reading learners.

For example, they prefer textbooks, written instructions, and note-taking. Reading tasks, written summaries, and encouraging written reflections cater to the interests of reading/writing students. Finally, kinesthetic learners benefit the most from hands-on experiences and physical exercises. Interactive activities, experiments, and real-world applications help them. Incorporating role-playing, simulations, and hands-on tasks can engage and encourage kinesthetic-oriented kids' learning processes. Thus, this study is essential to enhance the capability of the students to utilize different types of learning methods to ensure that the students readily understand and are more focused during the class.

2. Literature Review

Preferences of VARK Learning Style among Students: Each student's learning process is unique based on their personality, learning methods, techniques, and learning concepts. Learning methods may be effective in assisting students in understanding how to improve the way they study. There are four learning methods in VARK which are visual (V), auditory (A), reading/writing (R), and kinesthetic (K) (Awang et al., 2017).

According to VARK, each letter symbolizes different learning methods. Students with visual learning methods like to learn through the presentation of graphs, charts, diagrams, lecture notes, slides, and other visual representations (Magulod, 2019). These students benefit from seeing information to absorb and recall it efficiently, whereas auditory students prefer to obtain information by listening, such as spoken instructions, discussions, and verbal explanations. They frequently benefit from lectures, group discussions, podcasts, and other auditory ways of learning (Haryana, 2020). On the other hand, students prefer to absorb all information through written words. These students prefer to read and write to gain and retain knowledge, whereas kinesthetic learners prefer hands-on experiences and physical activity to learn and understand concepts (Cabual, 2021). These students benefit from interactive and exciting learning activities such as labs, fieldwork, and other movement-based activities.

Individual learning methods can considerably help students by positively influencing their academic achievement. Understanding their unique learning methods can have an important influence on their academic performance. When students are aware of their preferred learning methods, they can select methods of study that are more beneficial for them. This can lead to higher engagement, better comprehension, and improved information retention. As a result, students who engage in how they study with their learning methods often perform better academically.

Preferences of Learning Styles among Students by Their Courses: Most students have their own learning methods and preferences when it comes to academic performance. The learning methods preference describes

the complex procedure/process by which students attempt to perceive, process, store, and retrieve information in an effective way (Melo et al., 2022). Learning methods vary between each student and although each student has a unique learning method, there are generally four types of learning methods that can be found among the students which are Visual (V), Auditory (A), Reading/Writing (R) and Kinesthetic (K) (Kamal et al., 2021). Students' learning method preferences are essential as they need to achieve an outstanding examination outcome. By knowing which learning method is the best, it will enhance the quality of learning obtained by students (Tong et al., 2022).

Several studies have shown that students from different fields of study have different learning method preferences (Hu et al., 2021). Past studies on students' learning preferences have demonstrated that these preferences vary across several streams and courses, including engineering, science, humanities, architecture, pharmacy, and health sciences (Hu et al., 2021). According to research conducted by Kamal in 2021, he found that most healthcare science students choose unimodal learning methods which is 86.8% of students over multimodal learning methods which is 13.2% of students. Among the unimodal learning methods, 32% of students preferred visual methods, 26% of students preferred reading/writing methods, 10% of students preferred auditory methods and 20% of students preferred kinesthetic learning methods. As a result, visual learning methods received the most preferred learning method as the students can understand better with that method.

Next is a study conducted by Fahim et al., (2021) surveying 1,473 undergraduate students from medical and dental colleges in Pakistan. The survey found that 39.37% of students chose a unimodal learning method, while 60.62% of students chose a multimodal method. It was found that Kinesthetic was the most preferred unimodal learning technique, followed by Visual, Auditory, and Reading. Furthermore, a finding by Noor in 2019 found that 433 undergraduate students from four faculties at a private university in Selangor preferred Kinesthetic learning methods which were recorded by 30.3% of students, followed by Visual which is 28.4%, Auditory which is 27.9%, and reading which is 27.9%. As a result, students from different courses have different learning methods.
H1: *There is a relationship between course and preferences of learning methods*

The Influence of Gender on Learning Preferences: Gender, both male and female, is one of the elements that can influence learning method preferences. The gender difference affects learning methods. Gender is an unavoidable fact, and differences are reflected in various social contexts. When the learning methods preferences of male and female students were investigated, it was discovered that female students preferred learning methods that differed from those of male students (Alkooheji & Al-Hattami, 2018).

However, gender is highly associated with learning methods preference, especially when it comes to sensory learning methods. However, some students prefer only one feature of learning methods, while others struggle to use more than one. Students are divided into two categories: multimodal methods and single methods. Students in the multimodal methods category used more than one method to study, whereas students in the single methods category relied solely on one method. He also classified students into four learning methods: visual, kinesthetic, auditory, and read/write (Hamidon, 2015). Male students favored a multimodal combination learning approach, whilst female students chose unimodal learning. Female students preferred a single mode of information presentation, either visual, auditory, read-write, or kinesthetic, whereas male students did not prefer read-write as a learning method option, which could be attributed to males' carefree nature compared to females, who are more hardworking conscientious (Barman et al., 2014).
H2: *There is a relationship between gender and preferences in learning methods*

The Influence Of Age Toward Preference Learning Method: The learning methods that university students prefer to use are often determined by their age, which is a result of their previous education as well as the changing levels of mental capacity that come with each stage of life. The range of life experiences that senior university students may bring to the table could support self-driven learning and the practical application of knowledge.

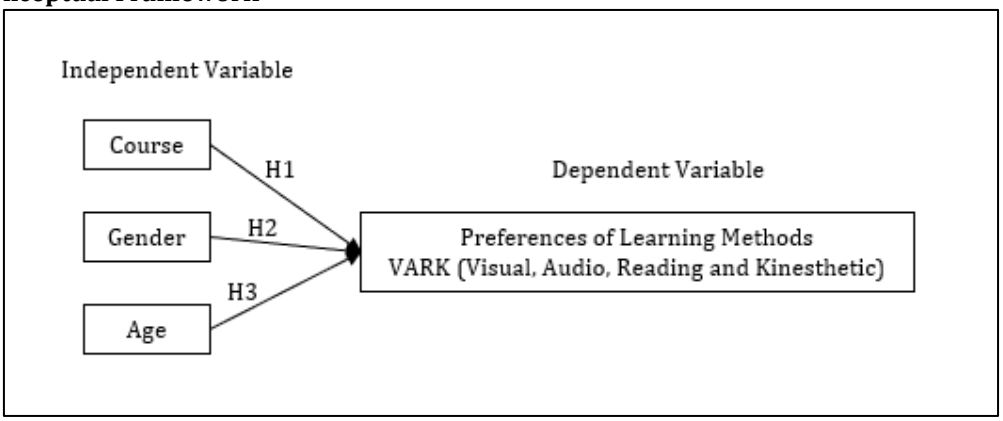
Younger undergraduates, who are recently graduating from high school, maybe more used to structured learning environments, but they may also show a preference for Visual and kinesthetic learning methods (Liew

et al., 2015). These preferences are impacted by age, which emphasizes the value of providing a wide range of teaching methods to meet the different needs and challenges of university students in every age group. In our research report, the students can be categorized into three groups for deeper study. The first group is categorized for ages below 20, while the second group is categorized by a wide range of 21 -25 and the third group is above 26. Overall, they all had preferences that were primarily visual and kinesthetic, with very little preference differences between the two in all age groups (Alkooheji & Al-Hattami, 2018).
H3: *There is a relation between students' age on preferences of learning methods.*

Conceptual Framework

Figure 1 shows the conceptual framework of the study. Three independent variables involved in the study are the student's course, gender, and age, while the dependent variable is preferences of the student's learning methods in terms of VARK (Visual, Audio, Reading, and Kinesthetic).

Figure 1: Conceptual Framework



3. Research Methodology

Research Design: This study employed quantitative research and adopted correlational types of investigation. A correlational relationship indicates that at least two concepts or variables move simultaneously. This study intends to look at the relationship between course, gender, and age toward preferences of learning methods of VARK (Visual, Audio, Reading, and Kinesthetic). This study has minimal interference from the researcher in a non-contrived setting since it is conducted in a normal environment and did not change any situation. The unit of analysis in this study is the individuals, which are students from the Faculty of Business and Management, Faculty of Accountancy, Faculty of Graphic Design, and Faculty of Nursing.

Sampling: Quota sampling was chosen in this study. Quota sampling is a method of non-probability sampling in which the samples are selected based on the probability proportionate to the distribution of a variable in the population (Rukmana, 2014). In this study, the respondents were divided into 4 groups based on the faculty which are the Faculty of Business and Management, Faculty of Accountancy, Faculty of Graphic Design, and Faculty of Nursing. The reason quota sampling was chosen is that the researcher would like to investigate the courses, gender and age influence the preferences of learning methods. A total of 341 respondents were chosen as a sample in the study. The total size of the population for the overall course is 3,000 students.

4. Results

This section presents the result from the analysis comprised of reliability analysis, frequency distribution of the demographic profiles, descriptive statistics, cross-tabulation, regression, and correlation analysis. The findings from this section will conclude whether there is a relationship between course, gender, and age toward preferences of learning methods.

Reliability Analysis: Table 1 shows Cronbach's alpha value for independent and dependent variables.

Reliability analysis assesses the internal consistency of the variable answered by the respondents. Salkind (2015) indicated that Cronbach's alpha value of more than 0.8 is considered good internal consistency. From the table, it can be concluded that all the variables involved in the study have good internal consistency.

Table 1: Cronbach's Alpha Value

Variable	Cronbach's Alpha
Course (Independent Variable)	0.862
Gender (Independent Variable)	0.853
Age (Independent Variable)	0.870
Preferences of Learning Method (Dependent Variable)	0.815

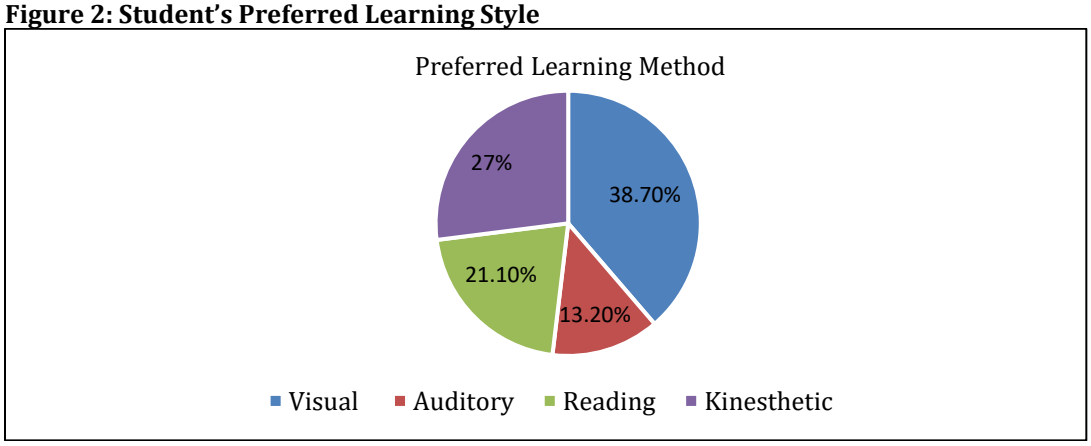
Profile of Respondents: Table 1 displays the demographic profiles of the respondents. Most of the respondents are male with 60.7% and are between 21- 25 years old (75.4%). Among the four groups of courses, the Faculty of Accountancy had the highest number of respondents with 30.8% followed by the Faculty of Business and Management with 29.9%. The lowest percentage comes from the Faculty of Graphic Design with 26.4% followed by the Faculty of Nursing with 12.9%. The majority (37.8%) of the respondents are students from Semester 5 while the lowest (3.2%) is from Semester 1.

Table 2: Demographic Profiles of the Respondents

Classification		Frequency	Percentage (%)
Gender	Male	207	60.7
	Female	134	39.3
Age	Below 20 years old	50	14.7
	21-25 years old	257	75.4
	Above 25 years old	34	10.0
Course	BA241 (Faculty of Business and Management)	102	29.9
	AC220 (Faculty of Accountancy_	105	30.8
	CAAD241 (Faculty of Graphic Design)	90	26.4
	HS240 (Faculty of Nursing)	44	12.9
Semester	1	11	3.2
	2	49	14.4
	3	46	13.5
	4	106	31.1
	5	129	37.8

Preferred Learning Style: Figure 2 shows the most preferred learning method from the respondents. Most (38.7%) of the students agree that Visual is their preferred learning method followed by Kinesthetic with 27%, Reading with 21.1%, and Auditory with 13.2%. The reason why Audio is the least preferred learning method is the courses involved in this study are more hands-on activities and lectures.

Figure 2: Student's Preferred Learning Style



Descriptive Statistics: This section portrays the descriptive statistics on the level of agreement between course, age, and gender towards preference of learning method. The mean is ranked based on highest to lowest to determine which statement has the highest level of agreement and vice versa.

Influence of course and learning methods: Table 3 shows the mean and ranking on the relationship between course and preferences of learning methods. Most of the respondents agree that graphic design students prefer to use visual learning methods followed by the statement that students noticed an improvement in academic performance at the second ranking. However, the least agreed statement is that certain learning methods are more enjoyable and less stressful. Overall, all respondents agree with most of the statements.

Table 3: Mean and Ranking on the Statement of Course and Learning Methods

No.	Statement	Mean	Ranking
1.	I think graphic design students more to use visual learning methods.	4.48	1
2.	Have you noticed any improvements in your academic performance as a result of choosing a specific learning style?	4.32	2
3.	Do you believe your learning styles influence your choice of learning method?	4.19	3
4.	Do you believe your understanding of learning style will help you to improve your study performance?	4.04	4
5.	Do you agree it is important for students to be aware of their learning preferences at an early age?	4.01	5
6.	Do certain learning methods make learning more enjoyable and less stressful?	3.88	6

Influence of age and learning methods: The mean and ranking on the statement of age and learning methods are shown in Table 4. Ranking number 1 most of the respondents agree with the statement that students should be aware of their suitable learning method at an early stage. It was followed by the statement increasing the chosen learning methods increase as age grows older. However, the least agreement is age affects the motivations for learning. It means that most of the respondents agree that motivation for learning is not affected by the age of the students,

Table 4: Mean and Ranking on the Statement of Age and Learning Methods

No.	Statement	Mean	Ranking
1.	Do you think it matters that student be aware of their suitable learning method at an early stage?	4.30	1
2.	Does your understanding of your chosen learning method increase as you grow older?	4.09	2
3.	Do you think age can influence one's exposure to various educational methods and environments?	4.06	3
4.	Do you agree educators should consider age when tailoring learning methods to students?	3.94	4
5.	Do you believe age affects your openness to trying new learning methods?	3.91	5
6.	Does your age affect your motivations for learning?	3.79	6

Influence of gender and learning methods: Table 5 shows the mean and ranking on the statement of gender and learning methods. The majority of the respondents agree that environment can influence the development of gender learning style. It was followed by the statement that gender is a factor that educational institutions should consider when designing curriculum content. The least agreement is on the statement of adopting learning methods based on gender. It indicated that gender was not the main factor that influenced the preferences for learning methods.

Table 5: Mean and Ranking on the Statement of Gender and Learning Methods

No.	Statement	Mean	Ranking
1.	Do you think environmental factors can influence the development of gender learning styles?	4.26	1
2.	Gender is a factor that educational institutions should consider when designing curriculum content	4.20	2
3.	Females tend to lean toward more verbal learning styles, while males might prefer more kinesthetic methods	4.19	3
4.	Do you think some gender-related stereotypes or expectations influence the choice of learning methods, particularly in education settings?	4.04	4
5.	Do you think that educational institutions should consider gender differences when designing and delivering learning materials and methods?	3.95	5
6.	I am more likely to seek out and adopt learning methods based on my gender	3.69	6

Cross Tabulation: The purpose of cross-tabulation is to compare two categories whether there are the same or different opinions. In this study, cross-tabulation was used to compare gender, age, and course based on their preferences in learning methods.

Table 6 compares the opinions between courses and their preferences for learning methods. It can be seen that Most of the courses prefer the visual learning method except the Faculty of Accountancy which prefers the Reading learning method. The Faculty of Graphic Design has almost equal numbers on Visual and Kinesthetic. It was understood that the Faculty of Graphic Design utilizes more hands-on activities like drawing and sketching. BA241 refers to Bachelor of Business Administrative Insurance, AC220 is Bachelor of Accountancy, CAAD241 is Bachelor of Graphic Design and HS240 is Bachelor of Nursing.

Table 6: Cross-Tabulation of Course and Preferences of Learning Method

Count

		What is your preferred learning style?				
		VISUAL	AUDITORY	READING	KINESTHETIC	Total
Course	BA241	41	36	14	11	102
	AC220	10	6	53	36	105
	CAAD241	45	2	1	42	90
	HS240	36	1	4	3	44
Total		132	45	72	92	341

The comparison between age and preferences of learning method is shown in Table 7. It shows different types of ages prefer different types of learning methods. Respondents aged below 20 prefer Reading, respondents between 21 and 25 years old prefer visual, and respondents above 26 years old prefer kinesthetic.

Table 7: Cross-Tabulation of Age and Preferences of Learning Method

Count

		What is your preferred learning style?				
		VISUAL	AUDITORY	READING	KINESTHETIC	Total
Age	BELOW 20	21	1	27	1	50
	21-25	106	43	42	66	257
	ABOVE 26	5	1	3	25	34
Total		132	45	72	92	341

The gender was tested whether they have different preferences for learning methods as shown in Table 8. Based on the table, it can be indicated that there are no differences between the genders in the preferences

for learning methods. The majority of the respondents regardless the gender prefer the Visual learning method.

Table 8: Cross-Tabulation of Gender and Preferences of Learning Method

		What is your preferred learning style?				
		VISUAL	**AUDITORY**	**READING**	**KINESTHETIC**	Total
Gender	MALE	80	40	13	74	207
	FEMALE	52	5	59	18	134
Total		132	45	72	92	341

Regression Analysis: The purpose of regression analysis is to describe the relation between the variables. In this study, the researcher would like to know the relationship between course, gender, and age toward preferences of learning methods.

Table 9 shows the model summary which consists of an R square. It can be indicated that 88.1% of the variance in preferences of learning style is influenced by the course, age, and gender, while another 12.9% was influenced by other factors not included in this study.

Table 9: Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.939[a]	.881	.880	1.270

a. Predictors: (Constant), Learning_Style_Age, Learning_Style_Course, Learning_Style_Gender

Table 10 shows the ANOVA table which indicates that the sig value of 0.000 is less than the significance value of 0.05 and proves that the overall model is valid.

Table 10: Analysis of Variance (ANOVA)

ANOVA[a]

Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	4038.409	3	1346.136	833.999	.000[b]
	Residual	543.943	337	1.614		
	Total	4582.352	340			

a. Dependent Variable: Preferences_Learning_Style
b. Predictors: (Constant), Learning_Style_Age, Learning_Style_Course, Learning_Style_Gender

Table 11 is the coefficient of the independent variable towards the dependent variable. Overall, course and gender are significant variables since the sig value is 0.000 less than a significant value of 0.05. Meanwhile, age is not significant since the sig. value is 0.945 more than the significant value of 0.05. The standardized coefficients show that the course has the highest influence on the preferences of learning method followed by gender and age.

Table 11: Coefficients of the Variable

Coefficients

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	-.330	.438		-.754	.451
	Learning_Style_Course	.384	.025	.689	15.134	.000
	Learning_Style_Gender	.210	.036	.269	5.886	.000
	Learning_Style_Age	.002	.031	.003	.070	.945

a. Dependent Variable: Preferences_Learning_Style

Correlation Analysis: The correlation table shows the linear relationship between the variables. According

to Hair (2010), the indication of a correlation coefficient value of more than 0.90 is a very high positive/negative correlation, while a value between 0.70 and 0.90 indicates a high positive/negative correlation. From Table 12, it can be indicated that there is a very high positive correlation between course and preferences of learning methods. Meanwhile, gender and age have a high positive correlation toward preferences for learning methods.

Table 12: Correlations of the Variable

		Preferences_Learning_Style	Learning_Style_Course	Learning_Style_Gender	Learning_Style_Age
Preferences_Learning_Style	Pearson Correlation	1	.931**	.886**	.825**
	Sig. (2-tailed)		.000	.000	.000
	N	341	341	341	341
Learning_Style_Course	Pearson Correlation	.931**	1	.894**	.859**
	Sig. (2-tailed)	.000		.000	.000
	N	341	341	341	341
Learning_Style_Gender	Pearson Correlation	.886**	.894**	1	.859**
	Sig. (2-tailed)	.000	.000		.000
	N	341	341	341	341
Learning_Style_Age	Pearson Correlation	.825**	.859**	.859**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	341	341	341	341

Discussion

The objective of this study is to investigate the relationship between course, age, and gender towards preferences of learning methods. The findings have revealed that Course and gender are significant variables in the preferences of learning methods, while age is not a significant variable. It is supported by Mahmud et al., (2019) that gender has different preferences for learning methods. Mkonto (2015) also mentions that different learning methods depend on the nature of the disciplines in which the students registered. Morin (2019) findings suggest that the ability to acquire knowledge incidentally about configural response relationships is largely unaffected by cognitive aging. This statement supported that age does not influence the preferences of learning methods. Thus, for the hypotheses, H1 and H2 are accepted while H3 is rejected (see Table 13). The H3 is rejected due to the insignificant value between student's age and preferences of learning methods. Overall, the model is valid and significant, and there is a very high positive correlation between course and preferences of learning methods, while gender and age have a high positive correlation toward preferences of learning methods. It can be concluded that the course has the highest influence on preferences for learning methods as compared to other variables (age and gender).

Table 13: Hypothesis and Decision

Hypothesis	Decision
H1: There is a relationship between course and preferences in learning methods	Accepted
H2: There is a relationship between gender and preferences in learning methods	Accepted
H3: There is a relation between students' age on preferences of learning methods.	Rejected

5. Managerial Implications and Recommendations

Knowing individuals' preferences for learning methods could enhance the students' understanding of the subjects and therefore improve their academic performance overall. Educators shall also tailor the lecture based on the preferences of learning methods based on their courses and gender. For future recommendations, it is essential to have technology integration during the era of Artificial Intelligence in education. It should be followed simultaneously with the preferences of learning methods for each student. Chen (2023) in the writing has mentioned that Artificial Intelligence (AI) will transform teaching and learning. It can be done through

simulating the students, real-time feedback and suggestions, post-teaching feedback, and refreshing expertise.

Conclusion

The objective of this paper was to investigate the relationship between course, age, and gender towards their preferences of learning methods. The learning methods are based on the VARK model, which is Visual, Audio, Reading, and Kinesthetic. Overall, the objective of the study is achieved and there is proven statistical evidence to show the relationship between the variables. In conclusion, each of the students has their preferred learning methods and it is mainly based on the courses they take and gender. It also can be indicated that age does not influence student preferences for learning methods.

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Supply Chain Resilience in the Face of Floods: A Case Study of Humanitarian Efforts by the Social Welfare Department in Malaysia

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Abstract: The objective of this study is to outline the issue of government-provided disaster relief management (JKMM) for flood victims during a disaster. Additionally, it examines communication and the planning of goods movement as key elements in determining the efficacy of Humanitarian Supply Chain Management (HSCM). This study focuses on the staff of the Social Welfare Department (JKMM), namely those from the Disaster Management Department and other agencies. The analysis of this research relies on a distinct dataset acquired from a survey conducted among the staff members. Researchers can more easily get quantitative measurements to analyze data on respondent variables. The operational sample comprises 137 participants. The study reveals that enhancing aspects related to the movement of goods and communication is crucial for improving the efficacy of HSCM. JKKM should ensure sufficient vehicle availability while simultaneously striving to minimize communication obstacles, such as limited network coverage. This paper stands out because of its unusual approach since it examines the challenges faced by the government agency (JKMM) in managing products for flood victims. This perspective sets it apart from earlier studies, which primarily focused on the experiences of flood victims and evacuation centers in Malaysia.

Keywords: *Disaster Relief Management, Disaster Relief Management, Communication, Planning Movement of Good and Government Agency*

1. Introduction and Background

Malaysia is located in a region that is geologically stable and virtually "disaster-free" in terms of natural and man-made disasters, such as floods. Though it has occasionally been struck by the ends of tropical storms, the nation is also too far south of the main typhoon tracks, placing it in a climatologically stable area. However, Malaysia does frequently see haze, landslides, floods, droughts, and human-caused disasters. According to Musa, Weng and Shafi (2015), the largest natural catastrophe risk in Malaysia is flooding. The frequency, mortality toll, and economic damage resulting from natural catastrophes are published globally, demonstrating how susceptible Malaysia is to flooding. Floods incur unquantifiable damages every year in addition to spreading illness, damaging crops and land, and killing a large number of people. Over the past 20 years, the nation has seen severe weather and climatic phenomena, which have led to significant storms in 2006, 2007, 2010, 2011, and 2014. The majority of these were monsoonal floods, which occur annually and differ in terms of location, severity, and timing. In areas of the country vulnerable to monsoon winds, a high death toll occurs (Musa, et.al, 2015). The primary reason for this, according to the former Director-General of the Drainage and Irrigation Department (DID) Malaysia, is the country's humid tropical climate, which is occasionally impacted by storms. Nonetheless, storms have gotten harsher and more frequent during the past few decades (Musa, et.al, 2015).

In Malaysia, 4.8 million people live in places in danger of flooding, while the country's geographical area is nine percent prone to flooding. In Malaysia, flood disasters are responsible for an annual loss of major proportions due to disease outbreaks, crop and property destruction, and casualties. Six Malaysian states experienced flooding as a result of seasonal high rainfall that started on January 23, 2017 (Johor, Kelantan, Pahang, Perak, Selangor and Sabah). In addition to providing disaster relief, Malaysia's National Disaster Management Agency (NADMA), the army, the police, and other local government organizations carried out evacuations and set up emergency shelters and evacuation centers. About 25,000 people were temporarily displaced by the floods, and some villages lost access because of destroyed bridges and obstructed roadways. Schools and health institutions are flooded. Schools weren't inundated and turned into makeshift shelters. Malaysia is concentrating on the resilience of growth as it advances socioeconomically to ensure that natural

calamities do not undo its progress. As a result, it's critical to plan ahead for natural catastrophes, identify communities and areas that are at risk, and provide the necessary resources in case they arise. These priorities, which include building a thorough framework for disaster risk management (DM) and safeguarding the nation's future, were emphasized in the Eleventh Malaysia Plan. Additionally, Malaysia has seen improvements in women's health, higher levels of education attained, and a rise in the number of women pursuing higher-paying jobs (NADMA Malaysia, 2019).

The way emergency relief is given has several issues that indicate their HSCM should function more effectively. Aside from that, assistance is not always provided to people, and when it is, it is irregular and takes a long time. There has been conflict there as a result of difficulties. Furthermore, the findings of Terap (2013) indicated a great deal of discontent with the JKMM, MKN, and District Office's handling of matand (Shafiai & Khalid, 2016) because they weren't performing them consistently. This was due to the victims' discomfort in the evacuation center and a shortage of rescue supplies. Terap(2013) who investigated flood relief management in the District of Padang Terap, Kedah Malaysia, provided evidence for this. According to their research, there was violence in flood relief facilities because there wasn't enough food or supplies, victims couldn't understand one another, the shelters were overcrowded, and there wasn't the necessary infrastructure or equipment. Furthermore, their investigation revealed that the evacuation center's management and upkeep must be handled by the responsible agency and that the facility is not yet prepared for use in the event of floods (Jaafar, et al., 2020). Thus, the government ought to consider and incorporate the feedback from victims to devise ways to improve the HSCM going forward (Shafiai & Khalid, 2016).

Therefore, the purpose of this study is to determine the important relationship between planning the flow of commodities and communication in relation to the efficiency of the humanitarian supply chain management by the Malaysian government and non-governmental organizations.

2. Literature Review

Communication is one of the critical factors that should be considered during flood disasters. Communication is done in all phases of disaster management preparedness, which involves early warning during and after a disaster (Zakaria & Mustaffa, 2014). Communication, also known as 'the act of transmitting', is explained by Martin, Nolte, and Vitolo (2016) as a medium to distribute a message or information in an organization or between two (2) different organizations. Communication conveys information transfer instructions before a natural disaster that is not known to comply with evacuation orders when the information is obtained from reliable sources and experts (Zakaria & Mustaffa, 2014). Earlier, it was considered a necessary expense, and hence, it lacked operational knowledge and investment in communication and technology (Jaafar *et al*.,2020). During the disaster response, communications have become more sophisticated due to new information and communications technology (ICT) developments for disaster management (Mohd, *et al*.,2018). The assessment of the performance of the humanitarian supply chain management is hindered by the inadequately executed policy of communicationimplementation at all levels that impacts the flood victims negatively (Jaafar *et al*., 2020).

Planning in the movement of goods

One of the program branches in logistics that calls for preparation and response stages in disaster management is the planning of the flow of products during disaster relief programs. The efficiency and speed of implementation of disaster assistance initiatives are essential components. The logistics system has to buy, store, and move food, water, medication, and other supplies as well as people, machines, and equipment-that are required throughout the pre and post-disaster time (Shafiai, 2016). Another responsibility of humanitarian supply chain analysis is the planning of the movement of products. Moreover, logistical movement is necessary for various procedures to handle calamity. As per Directive No.20 of the National Security Council (NSC), the government designates entities to handle the duties during a flood occurrence. Goods and people are moved in logistics planning in two movements. Malaysian disasters are handled by government agencies using top-down, people- and product-centered government operations. Malaysian disasters are handled via top-down, government-centered machinery. The researcher thus looked at the logistics of the movement of the product as planned by the Disaster Management and Relief Committee (Jaafar et al., 2020). Transport is especially crucial because of flood events, which necessitate evacuation to reach, according to Tamyez et al. (2019).

Many government agencies, including JKMM, respondent one remarks, need to possess their 4x4 or 6x6 transportation. To enter the flood disaster area, 4x4 vehicles and big lorries are necessary, but more is needed to be provided for them. In the case of the JKMM, this means dependency on rental vehicles, other organizations, or private volunteers who lend their vehicles to the agency.

Humanitarian supply chain management (HSCM) effectiveness

Humanitarian supply chain management (HSCM) is about managing the processes and systems involved in mobilizing people, resources, skills and knowledge to help vulnerable people affected by disaster, Thiruchelvam,Ismail, Ghazali, Mustapha, Norkhair, Yahya, & Muda, (2018). According to Shafiai and Khalid (2016) and John, Ramesh, and Sridharan (2012), humanitarian supply chain management (HSCM) effectiveness involves managing the different factors in the system to reduce the impact on the people who are affected by the disaster.The main task is to mobilize the goods, finance and administer the services to the beneficiaries. disaster relief requires activities in many dimensions, such as rescue efforts, health and medical assistance, food, shelter and long-term relief activities. The victims in the disaster supply chain HSCM are the act of providing humanitarian aidin the face of a, most often, natural disaster to the affected community. Planning the movement of goods,therefore, a mix of different kinds of operations involved in disaster relief and continuous support for developing regions. Generally, a distinction is made between continuous aid work and disaster relief, which usually entails a limited time scope. Planning movement of goods operations placed in the disaster management cycle between disaster preparedness and disaster response Khalid & Shafiai, (2015).

3. Research Methodology

The study used explanatory and descriptive research design. Appropriately, in descriptive technique, thestudy concentrates on the dedication of the frequency with which an event happens and how variables are connected in a specific context. What about the explanatory strategy? The study is concerned with determining the effect and cause-and-effect relationships among variables. Hence, this analysis is undertaken with explanatory and descriptive exploration design to explain the variables sufficiently and disclose the extent to which the elements of humanitarian supply chain functionality.

For this study, the target population is the employees from selected government agencies in Putrajaya, Selangor. A data collection was used for data collection, and the research instrument was adapted from previous researchers. There are seven humanitarian supply chain management items adapted from Shafiq and Sorarana (2019). In addition, there were seven items of communication adapted from Mohd, Fathi and Harun (2019) and finally, the 7 items of planning the movement of goods adapted from Jaafar et al. (2020). All the items use a four-point Likert scale, which is most appropriate because the information obtained can give a perception of the level of perception and not burden the respondent in decision-making or choice when responding to the questionnaire (Choy, 2014). The sample of this study is from civil servants that experience distributing humanitarian aid. The convenience sampling technique was applied to get the sample and regression analysis was applied in this study.

Demographic Profile

Among the respondents of this study, 59.9% were female, and 40.1% were male. The total number of respondents, both males and females, was 137. In addition, the 31-40 and 46-50 age groups reported the highest number of respondents (19.7%), followed by the 41-45 age group (18.2%). Meanwhile, respondents in the age group 18-20 reported the lowest number, which was 4.4% percent only. Furthermore, the highest number, 29.9% of the respondents, has worked between 1 to 5 years, while the lowest is 9.5% of the respondents who already worked for more than 31 years—moreover, the respondents' years of working in the humanitarian sector or relief chain operation. Based on the figure, it can be concluded that the highest number, which is 30.7% of the respondents, has worked in this field for more than 10 years; meanwhile, 19.7% have worked there for less than two years.

Table 1: Demographic Factor Analysis

Demographic Factors		Frequency	Percent
Gender	Male	55	40.1
	Female	82	59.9
Age	18-20	6	4.4
	21-25	22	16.1
	26-30	22	16.1
	31-40	27	19.7
	41-45	25	18.2
	46-50	27	19.7
	>50	8	5.8
Years of Service	5-6 Years	41	29.9
	7-10 Years	16	11.7
	11-15 Years	23	16.8
	16-20 Years	23	16.8
	21-30 Years	21	15.3
	> 31 Years	13	9.5
Working in Humanitarian Service	Less than 2 years	27	19.7
	5-6 Years	39	28.5
	7-10 Years	29	21.2
	> 10 Years	42	30.7

4. Results

Pearson Correlation Analysis

Table 2 shows a positive and linear correlation ($r = .803$, $p < 0.01$) between communication and humanitarian supply chain management effectiveness. The result indicates a significant relationship between communication and humanitarian supply chain management effectiveness. Hence, the hypothesis that thereis a significant relationship between communication and the humanitarian supply chain management effectiveness used by flood victims means that the hypothesis developed is supported.

In addition, there was a positive and linear correlation ($r = .945$, $p < 0.01$) between planning the movement of goods and the effectiveness of humanitarian supply chain management. Hence, the hypothesis that there isa significant relationship between the planning movement of goods and the humanitarian supply chain management effectiveness used by the agency to flood victims is supported. The correlation of the variables reported based on the analysis is 0.945 and proved that planning the movement of goods is the most prominent determinant of HSCM effectiveness used by JKMM for flood victim management. The findings show that JKMM should improve their planning movement of goods to avoid unorganized circumstances duringHSCM effectiveness—a previous study by Jaafar et al. (2020). Khalid et al.,2015, and Tamyez et al. (2019)found that the speed of delivering aid such as food, beverages, and others must also be improved during flood events to ensure, at times, meet the needs of flood victims.

Table 2: Pearson Correlation Analysis

Relationship	Pearson Coefficient	Sig. Value
Communication - HSCM Effectiveness	.803**	**0.00**
Planning Movement of Goods- HSCM Effectiveness	.945**	**0.00**

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

Regression Analysis

The research hypothesis is tested using multiple linear regression analysis. It is the best method or technique to analyze the relationship between independent variables that acted as a predictor and dependent variables that acted as a criterion at one time. The model summary analysis shows that a set of independent variablesis

weighted to form the regression equation or model so that it may be used to explain its relative contribution toward each variable admitted.

From the findings, the R-square and adjusted R-square values are 0.893 and 0.892, respectively. The result concluded that based on the table, 89.2% of the factors contributing to the effectiveness of humanitarian supply chain management revealed by planning the movement of goods and communication. The balance of 10.7% should explained by other factors not included in this research—the planning of the movement of goods and communication. The balance of 10.7 percent is explained by other factors not included in this research. The ANOVA table shows that F values 561.251, which is significant as the significance value is greater than 0.05 (p=0.000). The result indicates that combining the independent variables was significant to HSCM effectiveness. The beta weights presented in Table 4 suggested that communication (β=0.046, p=0.371) did not statistically significantly influence HSCM Effectiveness. In contrast, planning the movement of goods (β=0.906, p=0.371 found a statistically significant influence on HSCM Effectiveness. The result shows that planning the movement of goods is a much greater factor than communication in contributing to the effectiveness of humanitarian supply chain management.

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.945a	0.893	0.892	0.08199

Table 4: ANOVA Analysis

Model	Analysis	Sum of Squares	df	Mean Square	F	Sig
1	Regression	7.545	2	3.773	561.251	0.000
	Residual	0.901	134	0.007		
	Total	8.446	136			

Table 5: Coefficient Table

Model	Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
1		**B**	**Std Error**	**Beta**		
	(Constant)	0.308	0.122		2.523	0.013
	Communication Planning	0.042	0.047	0.046	0.897	0.371
	Movement of Goods	0.905	0.051	0.906	17.646	0.000

5. Managerial Implications and Recommendations

Conclusion

The study of humanitarian supply chain management in flood disasters by the Social Welfare Department Malaysia will strengthen their strategies and standard of procedure (SOP) during the natural disaster that affected the country and how to handle victims, especially in flood disasters. Moreover, the Social Welfare Department Malaysia (JKMM) is responsible for coordinating National Disaster management, establishing and ensuring all respective policies and implementing disaster management at each level. Finally, this research will add the Social Welfare Department Malaysia (JKMM) as a department of knowledge on National disaster management. It could be reference material for future researchers and academicians on flood disaster management. The findings reveal that the poor communication practices during the humanitarian aid need improvement till the present. An effective communication system to use during rescue and supply chain operations will expedite the process. JKMM has developed the application "InfoBencanaJKM", which everyone can download from the Play Store or Apple Store for free. Through these apps, people can get the latest information about flood disasters, such as info on evacuation centers, roads closed, affected areas and others. Aside from receiving information from JKMM, users can also update their details and give feedback through the applications. In addition, this app also assists JKMM in ensuring assistance can be given quickly and effectively through feedback received directly from flood victims.

On the other hand, this study is planning the movement of goods. In this study, planning the movement of goods

scored a very strong uphill linear correlation (r=0.945). Furthermore, research conducted by Jaafar et al. (2020) and Tamyez et al. (2019) proved that planning the movement of goods was the most important predictor of the HSCM's effectiveness. The finding implies that JKMM should hire enough staff to strengthen its rescue teameven though there are volunteers during any relief mission. Since the climate is changing with different patternsof flood disasters and unpredictability, adequate and well-trained staff is very important in ensuring assistance provided during HSCM effectiveness and the process of planning the movement of goods will be well managed.

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Factors Influencing Customers on the Use of E-Payment in Klang Valley

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Abstract: The adoption of electronic payment systems (e-payments) has gained significant traction worldwide. E-payment systems have become widely accepted and used in Malaysia's Klang Valley area. The purpose of this study is to investigate the elements that drive customer acceptance of e-payment systems in the Klang Valley, with emphasis on convenience, security, speed and social influence. Drawing upon existing literature, convenience emerges as a critical determinant of e-payment adoption. Security considerations also play a crucial role, as consumers prioritize platforms with robust security measures. Additionally, the speed of transactions is a significant factor influencing consumers' preferences with faster processing times. Furthermore, social influence, encompassing peer recommendations and societal norms, shapes consumers' attitudes and behaviors toward e-payment adoption. To empirically test these factors, a quantitative research methodology will be employed, with data collected through non-probability sampling techniques. The study will focus on people of the Klang Valley, especially Kuala Lumpur, who use electronic payment methods. The data will be analyzed and validated using descriptive analysis, reliability tests, Pearson correlation coefficient, and multiple regression analysis. This study's findings are likely to give useful insights for policymakers, industry stakeholders and researchers looking to encourage the acceptance and use of e-payment systems. Understanding the elements that influence customers' attitudes and behaviors toward e-payment adoption allows for the development of targeted strategies to improve the accessibility, security, and efficiency of digital payment systems. Finally, this study hopes to contribute to the promotion of financial inclusion and the growth of the digital economy.

Keywords: *E-payment method, Convenience, Security, Speed, Social Influence*

1. Introduction and Background

Electronic payment systems, or e-payments, have become a major component of contemporary financial operations, providing consumers and businesses with efficiency and convenience (Alam et al., 2021). Globally, the usage of electronic payment methods has increased in recent years as a result of changing consumer preferences and technological advancements. E-payment systems have been rather popular in Malaysia, especially in the Klang Valley area, where users are progressively using a variety of platforms and services (Karim et al., 2020).

Convenience is one of the most important elements in e-payment acceptance. One important aspect influencing consumers' decisions to use electronic payment systems is convenience (Karim et al., 2020). Digital payment methods are widely accepted due in large part to their accessibility and convenience of use (Razak et al., 2021). As a result, it is critical to understand how convenience influences e-payment system acceptance in the Klang Valley.

When it comes to using e-payment systems, users also need to take security into account. Customers are becoming more concerned about the security of their financial transactions due to the rise in fraud and cyber risks in the digital sphere (Batra & Kalra, 2016). According to research, better security measures will boost users' confidence and trust in e-payment systems, which will lead to higher usage (Barkhordari, 2016).

Additionally, important in influencing consumers' attitudes and actions regarding the adoption of e-payments is speed. When compared to traditional payment methods, digital payment systems' faster transaction times are frequently seen as more practical and effective (Ruzman et al., 2023). Efficient and smooth transaction completion enhances customer satisfaction and experience overall, which impacts adoption rates (Dutot, 2015).

Furthermore, it becomes clear that social influence plays a significant role in influencing people's decisions to use electronic payment systems. The degree to which people are impacted by the beliefs and actions of others is referred to as social influence (Hassan et al., 2020). Social factors that affect people's attitudes and intentions toward utilizing digital payment methods in the context of e-payment adoption include peer recommendations, social norms, and perceived societal expectations (Barkhordari, 2016).

Although a great deal of progress has been made in understanding the global factors driving the adoption of e-payments, there is still a lack of information in the literature about the particular dynamics at work in Malaysia's Klang Valley. Though e-payment systems are becoming more and more common in this field, little research has been done to examine the particular factors that influence consumers' choices to accept and use digital payment methods. To better understand the dynamics of e-payment adoption in this area, this study's research challenge is to look at the elements influencing consumers' use of e-payment in the Klang Valley.

2. Literature Review

The literature surrounding e-payment adoption encompasses various factors influencing consumers' decisions and behaviors in adopting digital payment methods. Convenience stands out as a significant determinant of e-payment adoption, as indicated by studies such as Manikandan and Jayakodi (2017). Convenience, often measured by the ease of use and accessibility of e-payment systems, plays a crucial role in shaping consumers' attitudes and intentions toward adopting digital payment methods (Singh & Rana, 2017). This suggests that consumers are more likely to embrace e-payment systems that offer seamless and hassle-free transactions, thereby highlighting the importance of convenience in driving adoption rates.

Security emerges as another pivotal factor influencing consumers' decisions regarding e-payment adoption. With the increasing prevalence of cyber threats and online fraud, consumers are becoming increasingly concerned about the security of their financial transactions (Batra & Kalra, 2016). Studies by Junadi (2015), and Taheam et al. (2016) underscore the significance of security in enhancing consumers' trust and confidence in e-payment systems. Enhanced security measures are thus essential for fostering greater acceptance and utilization of digital payment platforms.

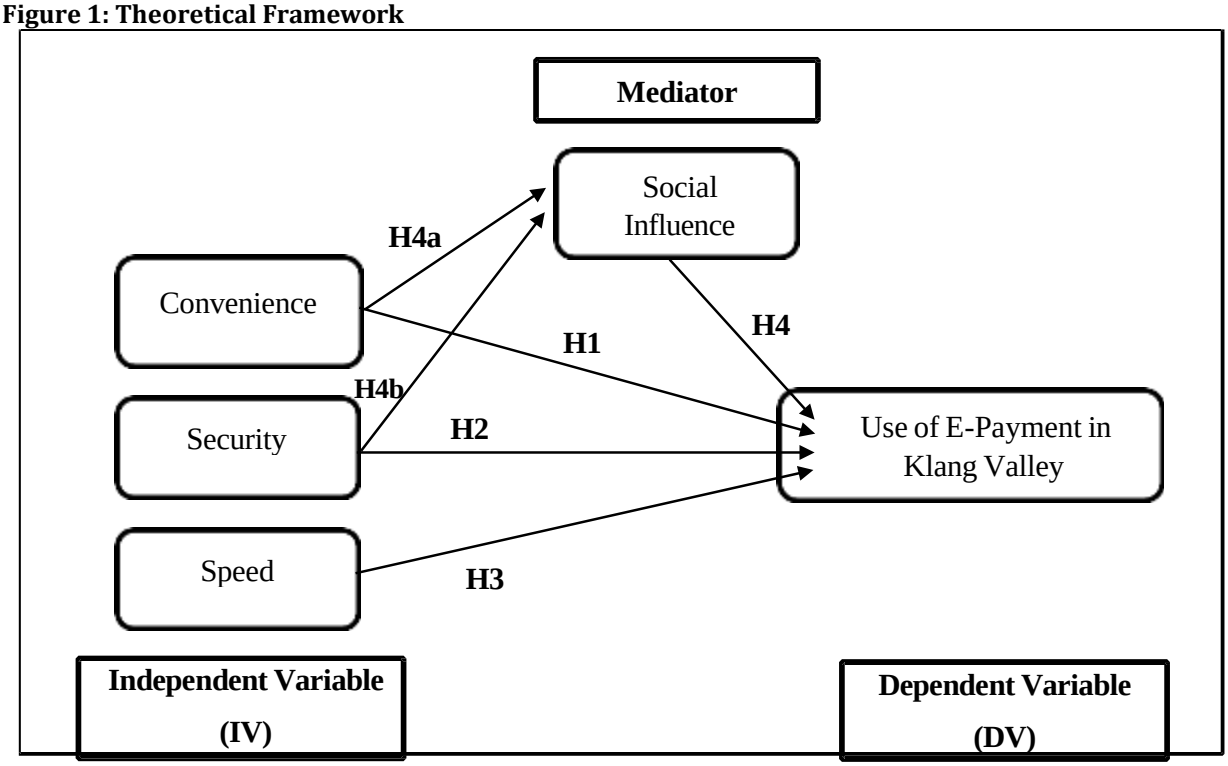
Speed also plays a crucial role in influencing consumers' perceptions and behaviors toward e-payment adoption. Faster transaction speeds offered by digital payment systems are often perceived as more convenient and efficient compared to traditional payment methods (Chen & Nath, 2008). Research by Tella and Olasina (2014) highlights the positive relationship between transaction speed and consumers' intentions to continue using digital payment methods. This suggests that the ability to complete transactions quickly and seamlessly is a key driver of e-payment adoption among consumers.

Moreover, social influence emerges as a significant determinant of e-payment adoption, particularly in the context of peer recommendations and societal norms (Venkatesh et al., 2003). Studies by Yang et al. (2012) and Taheam et al. (2016) emphasize the role of social factors in shaping individuals' attitudes and intentions towards using digital payment methods. Social influence can significantly impact consumers' perceptions of e-payment systems, as individuals may be influenced by the opinions and behaviors of their social network in deciding whether to adopt digital payment platforms.

Furthermore, the research has looked at the function of social influence as a mediator in the link between convenience and e-payment acceptance. According to Oliveira et al. (2016), social impact can have both direct and indirect effects on electronic payment uptake. Similarly, Yang et al. (2012) discovered that social effects increased e-payment acceptance rates by impacting perceived security. These findings underline the need to take into account social aspects when assessing consumer adoption of e-payment systems, as well as the need to investigate the mediating function of social influence in determining adoption behaviors.
The figure below displays the study's theoretical framework, in which convenience was discovered to be one of the most important elements driving E-payment system adoption. Aside from that, E-payment uptake will be influenced by security and speed. Consumers are more inclined to accept and utilize an application if they feel it is in line with their current behavior. As a consequence, marketing professionals may focus on the creation and implementation of marketing communication, as well as the application's compatibility, security,

and speed with use cases and advantages for a variety of lifestyles among the target demographic. This study projected that social impact will improve the links between convenience, security, and E-payment adoption speed. Previous study, on the other hand, refutes the notion that social influence has a substantial impact on e-payment uptake. Alam et al. (2021), Dutot (2015), and Razak et al. (2021). As a result of the previous debate, a number of variables have been gathered. The study's factors were convenience (CV), security (SC), speed (SP), social influence (SI), and e-payment adoption. (epD). The theoretical basis for this investigation is described below.

Figure 1: Theoretical Framework



3. Hypothesis Development

Convenience: The first hypothesis proposes that there is a strong positive association between convenience and the use of e-payment in Klang Valley. This hypothesis is supported by prior research indicating that the ease of use and accessibility of e-payment systems positively influence consumers' adoption and utilization of digital payment methods (Alam et al., 2021; Singh & Rana, 2017). Consumers tend to prefer e-payment platforms that offer seamless transactions and convenient features, which in turn, drive higher adoption rates within the Klang Valley region. Therefore, the hypothesis was:
H1: There is a significant positive relationship between convenience and the use of e-payment in Klang Valley

Security: The second hypothesis proposes that there is a substantial positive association between security and the use of e-payment in Klang Valley. Previous studies have shown that consumers' perceptions of security significantly impact their willingness to adopt e-payment systems (Gargaro, 2023; Karim et al., 2020). Enhanced security measures instill trust and confidence in consumers, encouraging greater utilization of digital payment platforms within the Klang Valley area. Therefore, the hypothesis was:
H2: There is a significant positive relationship between security and the use of e-payment in Klang Valley

Speed: The third hypothesis claims that there is a significant positive association between speed and e-payment usage in Klang Valley. Research indicates that faster transaction speeds offered by e-payment systems contribute to consumers' preferences for digital payment methods (Dutot, 2015; Razak et al., 2021). Efficient transaction processing enhances user experience, driving higher adoption rates of e-payment systems within

the Klang Valley region. Therefore, the hypothesis was:
H3: There is a significant positive relationship between speed and the use of e-payment in Klang Valley.

Social Influence: The fourth hypothesis states that there exists a significant relationship between social influence and the use of e-payment in Klang Valley. Previous studies have highlighted the impact of social factors, such as peer recommendations and societal norms, on consumers' adoption of digital payment methods (Alam et al., 2021; Dutot, 2015). Social influence plays a crucial role in shaping consumers' attitudes and behaviors toward e-payment adoption within the Klang Valley area. Accordingly, the following hypotheses were proposed:
H4: There is a significant relationship between social influence and the use of e-payment in Klang Valley

Social Influence as a Mediator: According to Barkhordari (2016), social influence has a direct or indirect effect on the adoption of electronic payments. Dutot (2015) discovered that social impact influenced E-payment adoption rates via influencing security. They discovered that social impact was significant for individuals who had direct effects as well as those who could become potential users. Gargaro (2023) discovered a link between social influence and an individual's intention and attitude toward new technologies. The hypothesis was, therefore:

The fifth hypothesis suggests that social influence mediates the relationship between convenience and the use of e-payment in Klang Valley. Prior research has shown that social factors mediate the influence of convenience on consumers' adoption decisions (Hassan et al., 2020; Karim et al., 2020). Peer recommendations and social norms influence consumers' perceptions of convenience, thereby impacting their adoption and utilization of e-payment systems within the Klang Valley region.
H4a: Social influence mediates the relationship between convenience and the use of e-payment in Klang Valley

The sixth hypothesis proposes that social influence mediates the relationship between security and the use of e-payment in Klang Valley. Studies have indicated that social factors mediate the influence of security perceptions on consumers' adoption behaviors (Razak et al., 2021; Wong & Mohamed, 2021). Peer recommendations and societal norms shape consumers' trust and confidence in the security of e-payment systems, influencing their adoption and utilization within the Klang Valley area.
H4b: Social influence mediates the relationship between security and the use of e-payment in Klang Valley

4. Research Methodology

The data for this research proposal will be gathered using a quantitative approach. The researcher's quantitative research attempts to persuade Malaysian individuals in the Klang Valley area to adopt e-payment systems by collecting numerical data or data that may be turned into usable statistics. This proposal employed the non-probability sampling approach. Convenience sampling was the most acceptable approach due to the study's time and money restrictions, as well as the study's high sample size, and it allows the researcher to conveniently acquire information about respondents. The study's target respondents were Klang Valley residents, notably those from Kuala Lumpur, who used an e-payment method. Kuala Lumpur's population in 2023 is predicted to be 8,621,724. The sample size for this study was estimated using a sample size calculator, which calculated the required minimum sample size. The G-power program was used to calculate the minimum sample size required for this study, which was 384 for populations greater than 1,000,000 in the Klang Valley.

This study was carried out with quantitative approaches. The purpose of this study was to quantify the elements that impact Malaysian individuals' adoption of e-payment systems by creating numerical data or data that may be converted into usable statistics. Descriptive analysis is an essential initial step in doing statistical studies. Descriptive analysis is the statistical description, grouping, and presentation of constructs of interest, as well as their associations. It is summarized using descriptive statistics based on the mean. The questionnaire findings will be evaluated for clarity. The Reliability Analysis procedure calculates a number of regularly used scale reliability metrics, as well as information on scale item relationships. Cronbach's alpha tests are used to determine the reliability of multiple-question surveys, such as Likert Scales. Pearson Correlation Coefficient is commonly used to investigate the existence of a link between quantitative data and two variables, and multiple regression analysis provides an objective method for examining the degree and nature of the link between the

independent variable and the dependent variable.

5. Managerial Implications and Recommendations

Subsequent investigators seeking to investigate the variables impacting consumers' utilization of electronic payment systems may build on the current theoretical models by comparing developing and developed nations, such as Singapore and Malaysia. This method makes it possible to comprehend how comparable elements could affect the uptake of e-payment systems in various socioeconomic settings on a deeper level. Through a comparative analysis of the adoption patterns and behaviors of residents in these two nations, researchers can discern any notable distinctions or resemblances in the factors that impact the adoption of electronic payment systems.

Researchers can collect standardized data by using the same questionnaire in both nations, which makes it easier to compare the two populations directly. This comparative study can clarify whether consumer attitudes and behaviors about the adoption of e-payments are influenced by cultural, economic, or regulatory disparities between emerging and industrialized nations. Convenience and security, for example, may become the common elements propelling the adoption of e-payments, but their relative importance and the particular issues surrounding them may differ throughout nations.

Furthermore, to gather more detailed insights into the experiences and difficulties that particular population segments, like enterprises or consumers, have with e-payment systems, future studies may focus on these areas. Policymakers and industry stakeholders can customize interventions and activities to target the specific needs of the demographic groups or industries that are having trouble adopting e-payment systems. This focused strategy helps to strengthen e-payment systems generally and maximizes the effectiveness of initiatives, which in turn encourages more citizen acceptance and utilization.

Conclusion: The study closes by recommending a detailed investigation of the elements influencing consumer adoption of electronic payment systems in the Klang Valley region. Through the establishment of hypotheses, the study hopes to evaluate the importance of speed, convenience, security, and social influence in influencing customers' attitudes and behaviors toward digital payment systems. The project's quantitative research strategy seeks to collect empirical data to validate proposed hypotheses and get a better understanding of the dynamics of e-payment acceptance in the Klang Valley. Furthermore, the study offers managerial implications and recommendations for further research, such as targeted investigations into certain demographic groups and comparative studies of industrialized and developing countries. Finally, the study seeks to provide insights that will help lead the development of effective initiatives to stimulate the acceptance and use of e-payment systems, therefore boosting financial inclusion and the growth of the digital economy in the Klang Valley and beyond. This will be performed by addressing the research question and analyzing the hypotheses that have been proposed.

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Factors Affecting Consumer Responses to Influencer Marketing Campaigns

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Abstract: In Malaysia, the emergence of influencers on social media has significantly influenced consumer behavior as many people connect and look up to these digital personalities. This study aims to investigate how factors such as trustworthiness, expertise, attractiveness, respect and likeness influence consumer responses to influencer marketing campaigns. Specifically, the research objectives are to examine the relationships between each of these factors and consumer responses and to determine whether consumer attitudes influence these relationships. In addition, the TEARS model appears to be more appropriate for this study than Ohanian's (1990) source of credibility model because it incorporates characteristics of respect and similarity that align well with Eastern cultural norms. Respect and similarity are particularly important in Eastern societies where social harmony and collective values are emphasized**.** The TEARS model therefore provides a more comprehensive framework for understanding the impact of influencer endorsements in this cultural context. For this empirical study, data was collected from Shah Alam consumers aged 20-40 years old who own TikTok accounts and follow TikTok influencers who share and endorse products on the TikTok platform. Data was collected from 250 people, 200 of whom were classified as valid respondents. The survey was published online and the data was collected by the researcher using Google Forms. The links to the Google Forms survey were shared on social media such as Facebook, Instagram and WhatsApp. By focusing on these dimensions, the study fills research gaps by analyzing how these factors interact within influencer marketing, especially in an Eastern cultural setting.

Keywords: *Social media, Customer response, Marketing campaigns, trustworthiness, Attractiveness, Expertise*

1. Introduction and Background

The development of e-commerce in Malaysia gained momentum with the launch of the eBay website in 2004, followed by the launch of Zalora, Lazada and Shopee shortly thereafter. Shopee became the leading e-commerce platform in Malaysia. With the development of infrastructure for a wide range of online customers and a thriving economy, Malaysia has quickly established itself as a hub for online businesses. The Malaysian government has also taken some great initiatives to support the growing online market (Team, 2023) The COVID-19 pandemic was one of the main reasons why many people around the world became addicted to online shopping. TikTok quickly became the fastest-growing social media platform during the pandemic. With an impressive 1506 million downloads, TikTok has earned the prestigious title of the world's most downloaded app in 2020 and 2021, surpassing even Instagram's 1048 million downloads, (Forbes, 2021). In 2020, a remarkable 36.0% of marketers in the United States integrated TikTok into their influencer marketing strategies. This percentage increased significantly to 42% the following year, demonstrating the platform's growing importance in the marketing landscape (Forbes, 2021). Despite TikTok's rapid growth, there has been little analysis of how followers respond to influencer marketing on the platform.

A large number of Malaysians have switched to online shopping following the shutdown of physical stores during the pandemic, and despite the reopening of stores, online shopping continues to be favored for its convenience. The availability of affordable smartphones and better internet connections has been crucial in the emergence of social media influencers in Malaysia, as an increasing number of individuals are getting involved in influencer-generated content on social media platforms. In recent years, there has been a consistent increase in the number of social media users in Malaysia. Recent data shows that Malaysia had 31.76 million social media users in 2021, with a projected increase to 33.46 million by 2025 (Statista Research Department, 2023). Reports are widespread that individuals in Malaysia, particularly those aged 16 to 34, maintain an average of nine social media accounts. Social media is an amazing tool that allows users to communicate, share knowledge, and enjoy entertainment. Three main social media platforms, including Facebook, Instagram, and Twitter, are commonly seen as the top three in this industry.

Influencer marketing is gaining more popularity and rapidly expanding within the marketing sector. Paying

individuals to advertise products or services on social media platforms is part of it. Numerous marketers are integrating influencer marketing into their overall strategy. Therefore, this research adds to the current understanding of social media influencers. This study seeks to enhance its significance by incorporating a Malaysian viewpoint on the impact of social media influencers on consumer behavior. Research and market analysis indicate that this phenomenon has not been previously examined in this manner in Malaysia, so this study will offer a Malaysian viewpoint on the subject. Moreover, the results will assist businesses in creating plans to track and evaluate social media marketing efforts and patterns, all while reducing the adverse effects that social media influencers may have on people. This research study has incorporated the five elements of celebrity credibility on social media - trustworthiness, expertise, attractiveness, respect, and similarity - to assist practitioners and managers in selecting the most suitable influencer for their business. It will also help managers and marketing leaders create guidelines for connecting with consumers through effective collaborations with social media influencers. Yet, this research revealed a discrepancy in the connection between followers' buying habits and their faith in influencers. In this study, the researcher aimed to investigate consumers' reactions to influencer marketing campaigns. The study aimed to investigate if the results aligned with previous research on how consumer reactions to influencer marketing campaigns can be impacted by factors like expertise, attractiveness, respect, and similarity, aside from trustworthiness.

Social media influencers are individuals on social media platforms who have a high number of followers. (Veirman & Hudders, 2017, Harrigan, et al. 2021). Followers are becoming more linked to influencers and communities of influencers (Ki et al, 2020). This tool aids influencers in achieving success in their marketing and business endeavors, ultimately enhancing their brand and sales performance. Marketers are discovering that the technologies utilized in advertising and communication are advancing rapidly, causing shifts in markets and customer behavior (Dwivedi et al, 2020).

Consumers trust the opinions of fellow customers over companies when it comes to products and services, and social media is perfect for this as many customers are connected online (Naylor et al, 2012). In the current competitive market, people carefully look for customer feedback and reviews before making a purchase. Customers have an increasing inclination to share their experiences and opinions on well-known social media platforms like Facebook and Instagram, as well as reputable online platforms such as Shopee, Lazada, and Alibaba, impacting the purchasing decisions of others. These invaluable reviews not only assist new consumers in making their decisions but also greatly influence customer responses. testimonials from customers and third parties are perceived as more reliable by new users (Djafarova & Rushworth, 2017).

Using stars on social media to advertise is not a new concept. Before the rise of these platforms, businesses utilized actors and well-known figures in their advertisements to endorse and sell their products (Olenski, 2016). Nevertheless, social media influencers have become increasingly crucial for businesses to market their brands on online platforms due to the rise in internet usage and the significance of social media platforms (Ki et al, 2020). In earlier times, individuals who gained fame and acknowledgment were typically the ones who demonstrated outstanding performance in areas such as entertainment, sports, or leadership roles. The public widely recognized and celebrated their accomplishments and contributions. At the same time, social media influencers (SMIs) are putting in effort to build their presence on platforms like Facebook, YouTube, Instagram, Snapchat, and more (Swant, 2016). SMIs have a greater number of fans and subscribers compared to actors or athletes, and their opinions on products and services greatly influence their followers' actions (Veirman & Hudders, 2017). This study aims to contribute to the current understanding of this specific field. This study focuses on exploring the regions or dimensions that play a role in shaping consumer response to influencer marketing efforts.

Research Objectives: The surge in popularity of social media influencers in Malaysia has led to a growing number of individuals not just admiring them but also seeking to replicate their lifestyles and form authentic relationships with them. Evaluating factors that may impact social media users and analyzing what influences consumer reactions to influencer marketing campaigns is essential. The primary goal of this research is to analyze the factors that impact how consumers react to influencer marketing campaigns.
RO1: To examine the relationship between trustworthiness and consumer responses to influencer marketing campaigns.
RO2: To examine the relationship between expertise and consumer responses to influencer marketing

campaigns.
RO3: To examine the relationship between attractiveness and consumer responses to influencer marketing campaigns.
RO4: To examine the relationship between respect and consumer responses to influencer marketing campaigns.
RO5: To examine the relationship between similarity and consumer responses to influencer marketing campaigns.
RO6: To examine whether the consumer attitude mediates the relationships between trustworthiness and consumer responses to influencer marketing campaigns.
RO7: To examine whether the consumer attitude mediates the relationships between expertise and consumer responses to influencer marketing campaigns.
RO8: To examine whether the consumer attitude mediates the relationship between attractiveness and consumer responses to influencer marketing campaigns.
RO9: To examine whether the consumer attitude mediates the relationships between respect and consumer responses to influencer marketing campaigns.
RO10: To examine whether the consumer attitude mediates the relationships between similarity and consumer responses to influencer marketing campaigns.

2. Literature Review

There exists a wide variety of research questions that can be addressed. Above all, it marks the commencement of a research paper. The first stage involves formulating the research question, which is the initial significant step once you have a well-defined idea of your investigation focus.

Influencer Marketing: Influencer marketing involves compensating individuals to endorse a product or service on social media platforms (Campbell & Farrell, 2020). It is also referred to as the process of finding, involving, and endorsing individuals who interact with a brand or company's customers (Glucksman, 2017). Wei & Lu (2013) define a celebrity endorser as a famous individual who uses their public fame to promote a consumer product via advertising. This type of recommendation greatly influences how consumers view advertising and businesses, ultimately boosting their intention to make purchases and driving up sales. Research conducted by Tripp et al (1994) revealed that a celebrity endorsing a single or a couple of products is deemed more reliable compared to a celebrity endorsing numerous products. He asserts that there is always a possibility of harmful impact from numerous endorsements dealing with one celebrity. Studies have indicated that the recommendation from a spokesperson can greatly influence how consumers view advertising and products. This impact has the potential to enhance acquisition tactics and boost sales in the end.

Tears Model: The TEARS model of celebrity endorsement, created by Shimp (2007), remains applicable in current times and has been utilized by other scholars. Based on previous research, the effectiveness of a form of advertising relies on its trustworthiness and appeal, which encompass different sub-qualities. The TEARS model is made up of five dimensions: Trustworthiness, Competence, Attractiveness, Respect, and Similarity. Shimp (2003) explains that the endorser effect is defined by trustworthiness and attractiveness, critical characteristics that enhance the endorser's impact and are made up of various sub-attributes. Trustworthiness and expertise play a critical role in establishing trust, while physical attractiveness, respect, and similarity with the audience are crucial for overall attractiveness. In analyzing the impact of celebrity endorsers on advertising effectiveness, the TEARS model attributes of appeal, credibility, and knowledge were evaluated (Shimp, 2003). This specific category is essential for a comprehensive and credible evaluation of celebrity endorsements.

Through the use of the TEARS model, researchers can acquire valuable insights that can be directly beneficial for marketers, brands, and influencers. Enhanced knowledge of the elements affecting consumer reactions to influencer marketing enables the creation of more successful tactics and campaigns. The TEARS model incorporates various fields of study, such as marketing, psychology, and communication. Through the integration of insights from various fields, scholars can enhance their grasp of influencer marketing and its impact on consumer perceptions and buying decisions, facilitating a more in-depth and holistic examination. The TEARS model enables researchers to methodically examine various aspects of influencer marketing, such as the influencer's credibility and the content's relevance to the target audience. This organized method

ensures that all important factors are taken into account and assessed during the research process.

Trustworthiness: In this era of technology, a characteristic shows the perceived credibility of the source of a convincing message. Certain sources are seen as more reliable than others, such as word-of-mouth versus brand advertisements (e.g., WOM vs. brand ads, (Nielsen, 2013). The connection between individual opinions and how they affect outcomes through interpersonal relationships is influenced by how trustworthy the source is perceived to be. For example, (Smith et al, 2005) demonstrated that the credibility of the sender relies on the sender's level of expertise. The sender's ability, benevolence, and integrity also play a role in influencing it (Schoorman, et al, 2007). Consumers' reactions to influencer marketing campaigns depend on how the influencer behaves daily.

Expertise: The level of trust in a celebrity endorsement is greatly impacted by their knowledge of the subject they are promoting (Akram, et al, 2017). An authentic celebrity endorsement showcases a dedication beyond financial gain, showcasing a true admiration for the brand's quality.

Attractiveness: The attractiveness of a celebrity is based on how familiar, likable, and close they are to the consumer. The more well-known, pleasant, and understanding a celebrity is seen by the public, the more appealing they are seen to be. This implies that individuals emulate their preferred famous person (Till, 1998). Some people think that the effectiveness of an advertisement is influenced by physical attractiveness, intelligence, and charisma. Recognized widely is the fact that using familiar and visually appealing faces in ads can enhance consumers' memory and attractiveness towards the ad.

Respect: Respect, the letter R in the TEARS model, is the second important factor contributing to attractiveness among different attributes. Respect is defined as how much consumers value or admire an influencer for their accomplishments and characteristics. A celebrity's personal successes can result in a positive reputation and admiration, falling under the category of respect. Byrne et al. (2003) also discovered that liability can be synonymous with respect depending on the endorser's attributes or actions. Earlier research has also indicated that consumer purchase intention can be greatly impacted by respect (Hollensen & Schimmelpfennig, 2013).

Similarity: Similarity refers to the alignment of people in their beliefs, values, or other traits that impact how followers are influenced in their interactions with a specific influencer. The desired word-of-mouth on social media is similar to digital chatter, as consumers seek entertainment and validation from peers and influencers. This coming together of thoughts and actions is crucial for forming online connections and spreading information. According to (Kaplan, 2015), the content posted by key opinion leaders (KMI) regarding their day-to-day activities can impact their social standing and influence consumers or followers. Zhang & Zhang (2023) suggest that individuals who share common interests have a greater impact on a person's buying decision compared to those with conflicting opinions. If a customer is enthusiastic about the image or reputation of a social media influencer, they are inclined to purchase the product or brand endorsed by the influencer (Nejad et al, 2014).

Consumer Attitude: People's evaluations of objects, individuals, and themselves, known as attitudes, are developed through behavioral, cognitive, or affective experiences (Petty & Cacioppo, 1986). These assessments can influence actions and thinking patterns by inclining toward either a favorable or unfavorable perception of an object. Attitudes are developed when people assess an object using their own experiences, leading to the formation of beliefs. Attitudes are created by individuals as they assess an object using their experiences, leading to the development of beliefs. They can also be developed emotionally by consistently connecting with emotions. Petty (1986) mentioned that processing persuasive arguments necessitates both motivation and ability, and these arguments can either be central or peripheral. Attitudes tend to be resistant to change but are more likely to change through central processing of information (Smith, et al, 2005).

A survey on how consumers feel about relationship marketing showed that most of them have a favorable attitude, leading to positive consumer reactions (Jones, 2015). Just as influencer marketing focuses on building and sustaining relationships, relationship marketing also emphasizes the importance of cultivating connections, indicating that a favorable mindset towards one can impact the other. In a study conducted by Duffett (2017), it was discovered that consumers have a favorable view of social media marketing, specifically

influencer marketing, as it is commonly executed on social media platforms.

Consumer responses to influencer marketing campaigns: The reaction of consumers to influencer marketing campaigns is a dependent variable in this study. When revealing hidden advertising, the brand and one-sided message are linked. Influencer marketing involves social media personalities partnering with brands to endorse products or services to their large audience. Online behavior is the way individuals interact and engage with online products and services. It includes the behaviors and attitudes shown by consumers while they are buying products. Customer behavior, however, pertains specifically to the mentality and perspective of buyers when they make purchases on Internet platforms. This conduct may differ, as certain customers show favorable attitudes and actions, while others exhibit unfavorable tendencies. Scientists have found that behavior can be understood in multiple ways, as a concept with different dimensions (Li & Zhang, 2002). Various researchers and academics employ various parameters to evaluate consumer behavior. In previous studies, it has been affirmed that trust is essential in establishing strong relationships in business-to-business and business-to-customer settings (Emma, 2023).

Different criteria and measures are utilized by a variety of researchers and academics in assessing and examining consumer behavior. Trust is also essential for brands to build strong connections with customers and cultivate their loyalty (Selnes, 1988). A recent study on social media trends showed that 94 percent of marketers saw social media celebrities as effective in their marketing strategies, with influencer marketing offering 11 times more ROI than traditional advertising (Fertik, 2020).

Thanks to the latest e-commerce technologies, brands and consumers can now communicate more directly, gaining access to reliable information about products and making informed purchasing decisions quickly (ESW, 2022). In 2009, Lee's study discovered that social media information from a knowledgeable source regarding specific products has a greater impact on customers' buying decisions (Lee, 2009).

3. Hypothesis Development

Trustworthiness: Past research has indicated that the trust customers place in social media influencers, along with their content and posts, is significantly impacted by their level of trustworthiness (Lou & Yuan, 2018). Jelita & Rimiyati (2021) discovered that confidence in influencers is crucial in influencing consumer perceptions of advertising on social media. As a result, it has been determined that the credibility of social media influencers greatly influences followers' chances of making a purchase. Trustworthiness has been identified as the most significant factor affecting followers' behavior (Wiedmann & von Mettenheim, 2021). Consumers are more inclined to react positively to endorsers they see as reliable, as opposed to endorsers they see as unreliable (Walster et al, 1966). Whether the audience considers these celebrity endorsements to come from experts in the field or not, endorsers perceived as trustworthy are more persuasive (McGinnies & Ward, 1980). The most essential factor in influencing followers' perceptions of a recommended brand is the level of trust they have in social influencers (Nishith Bhatt, 2013). Additionally, a connection has been discovered by researchers between how followers view the reliability of social media influencers their intentions to purchase and their feelings toward the brand being promoted (Schouten, et al, 2019). In line with the aforementioned theories, this research considers the credibility of social media influencers as the key factor impacting their followers' purchase intentions. Hence, the study's results lead to the following suggestion being put forward:
H1: There is a significant positive relationship between trustworthiness and consumer responses to influencer marketing campaigns.

Expertise: When consumers are deciding on a product, they frequently look to social media influencers for advice (Kozinets, et al, 2010). Proficient social media influencers can convince consumers to trust their advice and interact with their product-focused posts (Liu et al, 2015). People who provide guidance or facts in areas they are highly knowledgeable in are seen as more trustworthy than people who give their opinions on subjects they are not well-informed about. A study using interviews revealed that the level of expertise influences the awareness of Instagram users regarding product reviews by social media celebrities (Djafarova & Rushworth, 2017). Consumers' purchase intentions are positively affected by the credibility of the source (Kim & Song, 2020). To establish lasting loyalty and trust with consumers, online influencers need to consistently enhance their expertise and abilities. Past studies have shown that advice from experts greatly influences how

consumers behave, resulting in lasting loyalty and trust in the guidance they receive. This emphasizes the significance of security in the approval of electronic payments. As a result, the hypothesis was:
H2: There is a significant positive relationship between expertise and consumer responses to influencer marketing campaigns.

Attractiveness: A different research discovered that attractiveness, combined with source recognition, greatly influenced customer intentions to purchase (Yi & Gong, 2013). Therefore, social media influencers play a significant role in influencing consumer perceptions and preferences towards certain products, affecting their decision to buy. To build trust with their viewers and keep them engaged, these online influencers must keep honing their content creation skills. Prior research has found that consumers are more likely to have positive attitudes toward brands when they receive information or recommendations from a credible, knowledgeable, and persuasive source (Williams, 2024).

Various prior research suggests a direct link between customers' buying habits and attractiveness, particularly the physical attractiveness of the individual (Khalid & Yasmeen, 2019). Influencers' appeal positively influences customer perceptions, leading to changes in buying behavior. Lim's research also identified a significant link between the willingness to buy and how well the product aligns with the influencer. This indicates that attractive social media influencers can positively influence their followers (Cheah, 2017). Furthermore, they found a significant relationship between the intention to buy and how well the product matches the source. This indicates that social media influencers who are visually attractive could have a beneficial influence on the people who follow them (Min, et al, 2019). Therefore, endorsers with attractive qualities who have positive attitudes can impact customers' purchasing intentions. Hence, individuals who have appealing qualities may be viewed positively by consumers and influence their buying decisions (Pornpitakpan, 2003). Social media influencers with attractive looks are more prone to grabbing the interest of their audience. Customers may have a more positive view of a social media star if the star is attractive and appealing in appearance (Agam, 2017). Based on the idea of identification, the appeal of the individual promoting a product or service is thought to be a key factor in impacting how receptive the target audience is to the ad.
H3: There is a significant positive relationship between attractiveness and consumer responses to influencer marketing campaigns.

Respect: Respect, denoted by the letter R in the TEARS model, is the second element of the overall attractiveness feature. It involves the respect and admiration gained from the achievements of the endorser. Celebrities are admired for diverse reasons, including their talent in acting, skills in sports, charming personalities, opinions on social issues, and other attributes. Celebrity figures who are respected are typically also admired, possibly due to their actions, looks, or other qualities (Byrne, et al, 2003). When well-regarded and popular celebrities sign contracts with various brands, their respect and likability can impact the brands they are connected to, ultimately boosting the brand's value and influencing consumers' perceptions of the brand positively (Shimp, 2003). Charbonneau & Garland (2005) found that employing a respected celebrity or athlete as the spokesperson is more impactful than using a regular model. Famous individuals can enhance advertisements by adding more nuance, complexity, and impact. Although anonymous models can convey some basic demographic details such as gender, age, and status, celebrities can provide these specifics with more accuracy (McCracken, 1989). Because of their fame and frequent appearances in the media, celebrities are often linked to a high social standing and have extra characteristics and influence (La Ferle & Choi, 2005). Consumers have a more positive perception of brands when highly regarded celebrities endorse them, as influenced by their admiration for the celebrities. Utilizing a well-known celebrity to endorse a brand is more impactful than utilizing a regular model (Johnson & Platt, 2023). Influencers can add elegance and impact to ads, offering a depth of demographic understanding that anonymous models lack. Their extensive popularity and regular appearance in the media frequently associate them with a feeling of renown and high standing.
H4: There is a significant positive relationship between respect and consumer responses to influencer marketing campaigns.

Similarity: In the same way, the third aspect of appeal and the S factor in the TEARS model indicates how closely an endorser matches with the audience in terms of key characteristics like age, gender, and ethnicity (Shimp, 2003). Deshpandé & Stayman (1994) found that trustworthiness and brand attitude can be influenced by an endorser's ethnicity. The researchers believed that this happens because individuals tend to have

confidence in those who are similar to them. The results back up the assertion made by Cialdini (2007) that we are naturally attracted to individuals who share similarities with us, whether it be in opinions, personality traits, background, or lifestyle. In contrast, Shimp (2003) suggests that similarity between the endorser and the audience becomes crucial in situations where there is a plethora of products or services to choose from and the audience is varied. In such circumstances, an influencer seen as relatable to the audience can greatly influence opinions and choices. This similarity, whether it is rooted in demographics or beliefs, strengthens the effectiveness of the message by establishing a connection. Previous research shows that individuals tend to prefer people who are similar to them, as previously mentioned. The similarity is the resemblance between the sender and the receiver of a message. The similarity between a famous person endorsing a product and a consumer receiving the message is determined by their shared needs, objectives, hobbies, and way of life (Ohanian, 1990).

H5: There is a significant positive relationship between similarity and consumer responses to influencer marketing campaigns.

Consumer Attitude: Marketing researchers have expressed interest in understanding consumer attitudes, as it is essential information for creating effective marketing plans (Solomon, 2010). Research has shown a direct correlation between attitudes and buying intent in consumer behavior, as discussed by Ting (2015) and Tarkiainen (2005). In contrast, Chen (2007) proposed that having a favorable outlook on a particular product is a key factor in determining consumers' intention to buy. Likewise, having a positive view of products promoted by social media influencers increases the likelihood of wanting to purchase.

H6: There is a significant positive relationship between consumer attitude and consumer response to influencers.

Consumer Attitude as Mediator: Lim et al. (2017) discovered a clear positive correlation between consumer attitudes and intent to purchase. This implies that people with positive opinions about influencers are more inclined to purchase the products they promote. Siqi et al. (2021) also back up this discovery by demonstrating a direct link between consumer attitudes and intention to purchase. These studies emphasize the significance of choosing appropriate influencers to encourage positive attitudes and boost attitudes and purchase intent. Jelita & Rimiyati (2021) also support this concept by showing that consumer perceptions of advertisements have a positive influence on purchasing intentions, serving as mediators. This supports the finding by López Mosquera et al. (2014) that consumer attitudes impact purchase intention positively, proposing a solid theory for a direct positive link between attitudes and intentions.

H6a: Consumer attitude mediates the relationship between trustworthiness and consumer responses to influencer marketing campaigns.

H6b: Consumer attitude mediates the relationship between expertise and consumer responses to influencer marketing campaigns.

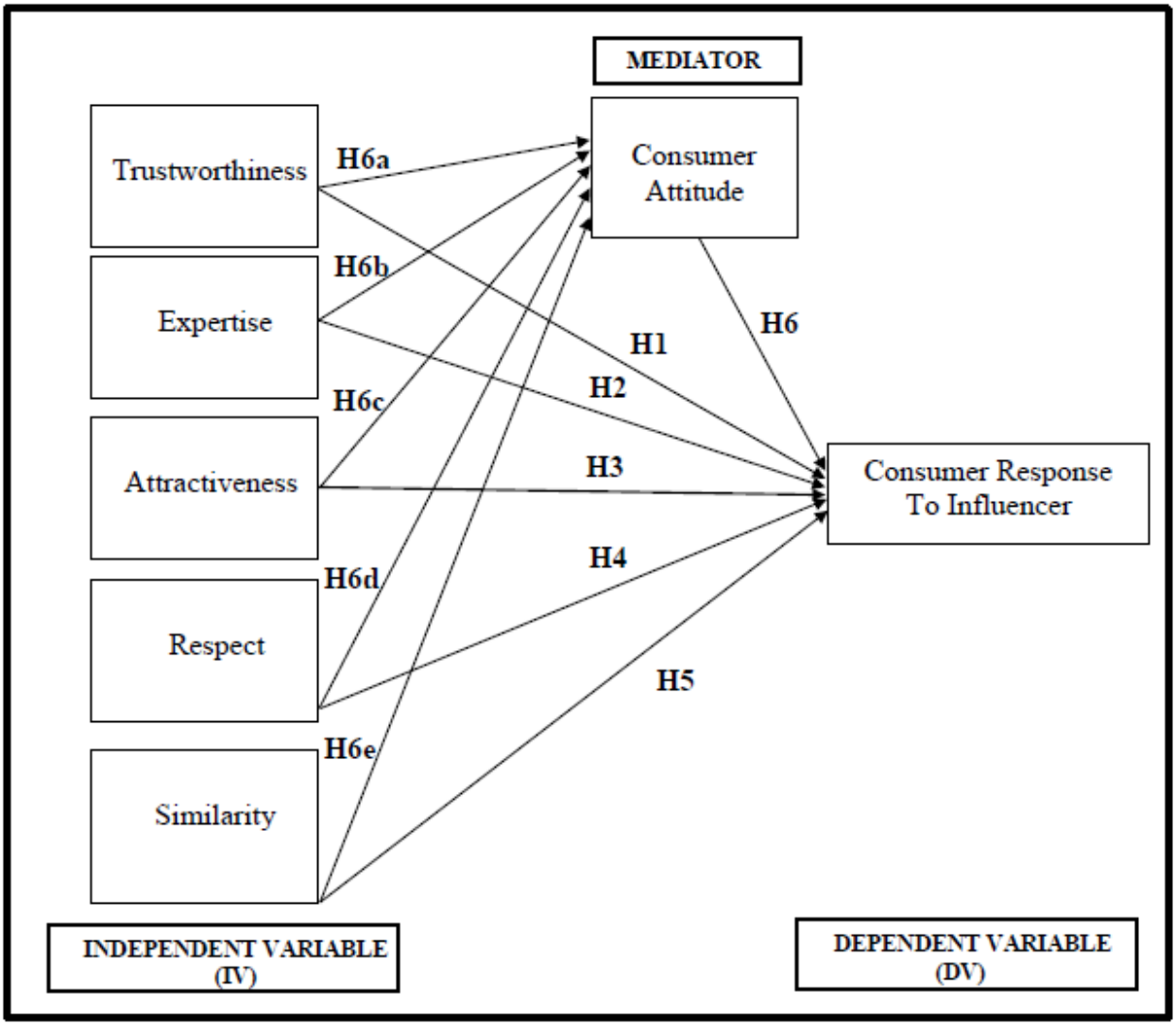
H6c: Consumer attitude mediates the relationship between attractiveness and consumer responses to influencer marketing campaigns.

H6d: Consumer attitude mediates the relationship between respect and consumer responses to influencer marketing campaigns.

H6e: Consumer attitude mediates the relationship between similarity and consumer responses to influencer marketing campaigns.

Based on the above-mentioned standpoint, a conceptual framework is proposed as depicted in Fig. 1 below:

Figure 1: Proposed Conceptual Framework



4. Methodology

In this research proposal, the researcher has opted to employ a quantitative research methodology. The process of quantitative research entails the precise gathering of numerical information, which is a valuable method for discovering intricate patterns, calculating averages, making reliable predictions, exploring cause-and-effect relationships, and ultimately reaching conclusions that apply to a larger group. In this specific research, the investigator effectively utilized non-probability sampling methods, which improved the accuracy and dependability of the results. Non-probability sampling is a fundamental method that depends greatly on the researcher's expertise. The researcher opted for convenience sampling as it simplifies sample collection. Individuals aged 20 to 40 years old were chosen from the GenY (1983-1996) and GenZ (1997-2004) cohorts. To qualify for this research, individuals must be "Following" at least one influencer on social networking platforms. Control questions were added to the survey to confirm that the intended sample was achieved. By applying the formula developed by Yamane in 1967, the study will need a sample size consisting of 400 participants. After running the F-test in G*Power 3.1.9.2 software, a sample size of 92 was calculated for this research study with an effect size of 0.15, a power of 80, and 5 predictors. Thus, the sample utilized in the statistical analysis was deemed suitable, as per (Chan, et al, 2021), which included 200 valid responses. (Sekaran, 2006) suggested that a sample size ranging from 30 to 500 is deemed suitable for research in the field of social science.

5. Conclusion and Conceptual Framework

The foundation for this study was based on the choice of the TEARS model theory. It enables the researcher to methodically examine the numerous aspects that impact how consumers react to influencer marketing campaigns. This research offers important information for brands and marketers seeking to enhance their influencer collaborations and increase campaign efficiency. Moreover, this study adds to the current pool of information in the marketing field, particularly focusing on consumer perceptions and buying intentions in influencer marketing. In addition to its expected managerial impacts, this study also offers advantages to business professionals seeking to utilize social media influencer endorsements as part of their marketing plan. Marketers can make well-informed decisions in choosing influencers to promote their products by taking into account qualities like trustworthiness, expertise, attractiveness, respect, and similarity. The TEARS model is frequently utilized in the marketing field for elucidating marketing communications. Banytė, Stonkienė & Piligrimienė (2011) applied the model to create a plan for choosing celebrities to endorse the Lithuanian national team, whereas (Kaushalya & Ranaweera, 2021) utilized the model to analyze Sri Lankan consumers' views on celebrity endorsers. This model was crucial for the study, offering priceless guidance to the researcher in pinpointing the key traits that consumers look for in a celebrity endorser.

Online businesses can enhance their decision-making process in choosing influencers and increase their marketing effectiveness in the digital era by utilizing this knowledge. The increasing significance of influencer marketing in the age of social media underscores its importance for marketers looking to impact the attitudes and actions of their desired audience. This study highlights five important characteristics that impact how consumers react to influencer marketing efforts: trustworthiness, expertise, and attractiveness. The research seeks to pinpoint the elements that impact how consumers react to influencer marketing efforts, giving both theoretical knowledge and practical guidance to businesses and advertisers. Industry professionals can enhance their influencer marketing initiatives by optimizing their strategies through understanding these factors. Retailers and marketers need to include important elements and factors that strategically improve a favorable consumer reaction to their business. The TEARS model is suggested as the main guide for choosing influencers.

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Measuring the Unmeasured: Exploring the Concept of "Supply Chain Quotient" [SCQ]

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Abstract: The concepts of intelligence quotient (IQ) and emotional quotient (EQ) have long been recognized as essential indicators of cognitive and emotional capabilities. However, the field of supply chain management lacks a standardized measure to assess the competencies required for successful supply chain operations. This article aims to fill this gap by introducing the concept of Supply Chain Quotient (SCQ) as a novel measure of supply chain competence. The SCQ framework expands beyond traditional intelligence and emotional factors, considering the unique skills and characteristics required in the complex world of supply chains. Drawing from existing literature on supply chain management, human resources, and cognitive psychology, this research explores the key dimensions and components that comprise the SCQ. The paper also examines potential methodologies and approaches for assessing and quantifying the SCQ, including self-assessment tools, case studies, and behavioral assessments. By introducing the SCQ, this research contributes to the understanding and evaluation of supply chain competence, providing organizations with a framework to identify, develop, and leverage talent in their supply chain functions. Additionally, it opens avenues for future research and practical applications to enhance supply chain performance and improve overall organizational outcomes.

Keywords: *Supply Chain Quotient (SCQ), Competence, Supply Chain Management, Assessment, Talent Development.*

1. Introduction

In the field of supply chain management, assessing the competence and capabilities of professionals has long been a topic of interest (Al Doghan & Sundram, 2023). While standardized measures such as intelligence quotient (IQ) and emotional quotient (EQ) have provided insights into cognitive and emotional abilities, the domain of supply chain management lacks a standardized measure to evaluate the unique competencies required for effective supply chain operations (Munir et al., 2018). This research paper aims to address this gap by introducing the concept of Supply Chain Quotient (SCQ) as a novel measure to assess supply chain competence and performance.

The SCQ framework expands beyond traditional intelligence and emotional factors, incorporating the specific skills and characteristics necessary in the complex world of supply chains. It seeks to provide organizations with a comprehensive measure to identify, develop, and leverage talent within their supply chain functions (Razak et al., 2015; Sivan et al., 2022). By exploring the dimensions and components of the SCQ, this research aims to provide insights into the assessment and quantification of supply chain competence, contributing to the overall understanding of the concept.

To begin exploring the concept of SCQ, it is important to review existing literature on supply chain management, human resources, and cognitive psychology. Understanding the foundational theories and research related to supply chain competence will help establish a solid basis for the development and validation of the SCQ framework. Additionally, examining assessment methodologies and approaches utilized in other fields can provide insights into potential strategies for measuring and quantifying the SCQ.

2. Literature Review

A. Underpinning Theories

The underpinning theory for the Supply Chain Quotient (SCQ) study draws upon several established theories and frameworks from various disciplines, including supply chain management, human resources, cognitive psychology, and leadership literature. Here's an outline of the key theoretical foundations:

Resource-Based View (RBV) of the Firm: The RBV posits that a firm's competitive advantage stems from its unique bundle of resources and capabilities (Barney, 1991). In the context of the SCQ study, this theory suggests that assessing and developing the competencies of individuals within the supply chain can contribute to the firm's overall competitive advantage. By identifying and leveraging the specific competencies required for effective supply chain management, organizations can enhance their ability to create value and achieve superior performance.

Dynamic Capability Theory: Dynamic capability theory (Teece et al., 1997) emphasizes an organization's capacity to adapt and innovate in response to changing market conditions. Within the SCQ framework, this theory underscores the importance of non-cognitive abilities such as adaptability and collaboration. Supply chain professionals with strong dynamic capabilities are better equipped to navigate uncertainties, respond to disruptions, and drive innovation within the supply chain ecosystem, thereby enhancing the organization's resilience and competitive advantage.

Social Cognitive Theory: Social cognitive theory (Bandura, 1986) emphasizes the interaction between individuals, their environment, and their behavior. In the context of the SCQ study, this theory underscores the role of observational learning and social modelling in shaping supply chain professionals' competencies. By providing opportunities for mentorship, peer learning, and cross-functional collaboration, organizations can facilitate the development of key competencies such as leadership, communication, and collaboration within the supply chain workforce.

Goal Setting Theory: Goal setting theory (Locke & Latham, 1990) suggests that setting specific and challenging goals can enhance individual motivation and performance. Within the SCQ framework, this theory highlights the importance of strategic thinking and goal orientation in supply chain management. Supply chain professionals who can set clear objectives, anticipate future trends, and formulate effective strategies are better positioned to drive organizational success and achieve supply chain excellence.

Complexity Theory: Complexity theory (Holland, 1995) posits that complex systems, such as supply chains, exhibit emergent properties that cannot be fully explained by analyzing individual components in isolation. In the SCQ study, complexity theory underscores the interconnectedness of various dimensions of supply chain competence and the need for a holistic approach to assessment and development. By considering the interactions between cognitive abilities, non-cognitive factors, and personal qualities, the SCQ framework provides a comprehensive understanding of supply chain professionals' capabilities and their impact on organizational performance.

By incorporating these specific theories into the SCQ study, researchers can provide a more nuanced understanding of the mechanisms underlying supply chain competence and performance, informing both theory development and practical applications within the field.

B. Past research studies

Assessing and measuring the competence and capabilities of professionals in the field of supply chain management has been a subject of interest for researchers and practitioners alike (Sundram, Rajagopal, Nur Atiqah, Atikah, Appasamy, & Zarina, 2018). While standardized measures such as intelligence quotient (IQ) and emotional quotient (EQ) have provided valuable insights into cognitive and emotional abilities, the domain of supply chain management lacks a standardized measure specifically tailored to evaluate the unique competencies required for effective supply chain operations (Sundram et al., 2017; Sundram et al., 2016).

To address this gap, this research aims to introduce the concept of Supply Chain Quotient (SCQ) as a novel

measure to assess supply chain competence and performance. To establish a foundation for the development and validation of the SCQ framework, it is essential to review existing literature on supply chain management, human resources, and cognitive psychology.

In the realm of supply chain management, Lambert and Cooper (2000) highlight the critical issues and challenges faced in managing supply chains effectively. Their work emphasizes the importance of competencies such as strategic planning, collaboration, and coordination across various stakeholders (Sundram, Rajagopal, Atikah & Subramaniam, 2018). Understanding these key dimensions of supply chain management competence is crucial in developing a comprehensive measure like the SCQ.

Within the broader context of human resources, Nembhard and Edmondson (2006) shed light on the significance of psychological safety and inclusive leadership in promoting improvement efforts in teams. Their findings suggest that fostering an inclusive and psychologically safe environment enables individuals to contribute their ideas and capabilities more freely. Incorporating such dimensions into the SCQ framework can help capture the interpersonal and leadership competencies required for effective supply chain management.

The field of positive psychology also offers insights relevant to measuring supply chain competence. Luthans, Avolio, Avey, and Norman (2007) introduce the concept of positive psychological capital (PsyCap), which encompasses individuals' positive psychological resources such as self-efficacy, hope, optimism, and resilience. Considering these positive psychological dimensions within the SCQ can provide a holistic view of supply chain professionals' capabilities and their potential to navigate complex and dynamic supply chain environments.

Examining successful supply chain practices can also inform the development of the SCQ framework (Muhammad, Naidu, Sundram, Hussain, Chew & Amirrudin (2023). Ferdows, Lewis, and Machuca (2004) discuss the concept of rapid-fire fulfillment, highlighting the importance of responsiveness, agility, and speed in supply chain operations. Integrating these operational dimensions into the SCQ can help assess professionals' abilities to effectively manage supply chain processes and drive customer satisfaction.

Furthermore, drawing insights from the leadership literature, Goleman (1998) identifies key leadership competencies, including emotional intelligence, visionary thinking, and relationship-building skills. Incorporating these dimensions into the SCQ framework can provide a comprehensive assessment of supply chain professionals' leadership capabilities and their potential to drive innovation and collaboration within the supply chain ecosystem (Muhammad, Naidu, Sundram, Hussain, Chew, Pillai & Ibrahim (2023).

In conclusion, the review of the literature highlights the need for a specialized measure to assess supply chain competence and performance. By synthesizing existing knowledge from supply chain management, human resources, cognitive psychology, and leadership literature, the development of the SCQ framework can capture the multidimensional nature of supply chain professionals' capabilities. The subsequent sections of this research paper will delve into the specific dimensions and components of the SCQ and propose methodologies for its assessment and quantification.

3. Methodology

As a conceptual paper, this research does not involve empirical data collection or analysis. Instead, the methodology focuses on the conceptual development and exploration of the Supply Chain Quotient (SCQ) framework. The following steps outline the methodology employed in this study:

Literature Review: A comprehensive review of existing literature on supply chain management, human resources, cognitive psychology, and related fields was conducted. This review aimed to identify key concepts, theories, and empirical studies relevant to supply chain competence assessment and performance measurement. The literature review formed the basis for the conceptual development of the SCQ framework.

Conceptual Framework Development: Building upon the insights gathered from the literature review, a conceptual framework for the SCQ was developed. This involved identifying and defining the key dimensions and components of the SCQ, which encompass the unique competencies and capabilities required for effective

supply chain management. The conceptual framework was designed to capture both cognitive and non-cognitive factors, incorporating elements such as strategic thinking, problem-solving abilities, leadership skills, adaptability, and collaboration.

Framework Refinement and Validation: The initial conceptual framework was refined through iterative discussions and feedback from experts in the field of supply chain management and related disciplines. This feedback helped ensure the conceptual soundness and applicability of the SCQ framework. While empirical validation is beyond the scope of this conceptual paper, future research should focus on validating the SCQ framework through empirical studies, such as surveys, interviews, or case studies.

Case Examples and Illustrations: To enhance the practical understanding and applicability of the SCQ framework, illustrative examples and case studies of supply chain professionals and organizations were examined. These examples were selected to demonstrate how the SCQ framework can be utilized to assess and enhance supply chain competence and performance. The case examples served to provide real-world context and showcase the potential benefits of adopting the SCQ framework in various supply chain settings.

Discussion and Implications: The methodology also involved a critical discussion of the implications of the SCQ framework for supply chain management practices and talent development strategies. By exploring the potential applications and benefits of the SCQ, this research aimed to stimulate further discussion and research in the field of supply chain competence assessment and performance measurement.

It is important to note that as a conceptual paper, the methodology focuses on the theoretical development and exploration of the SCQ framework. Empirical validation and testing of the SCQ framework should be pursued in future research to enhance its practical relevance and reliability.

4. Conceptual Framework

Conceptual Framework: Supply Chain Quotient (SCQ)

The conceptual framework for the SCQ aims to capture the unique competencies and capabilities required for effective supply chain management. It encompasses both cognitive and non-cognitive factors, incorporating elements such as strategic thinking, problem-solving abilities, leadership skills, adaptability, and collaboration. The framework consists of the following dimensions:

Cognitive Abilities:

- Strategic Thinking: The capacity to analyze complex supply chain dynamics, anticipate future trends, and formulate effective strategies to achieve organizational goals.
- Analytical Skills: The ability to gather, interpret, and analyze data to make informed decisions and optimize supply chain processes.
- Problem-solving: The aptitude to identify and address supply chain challenges and devise innovative solutions.

Non-Cognitive Abilities:

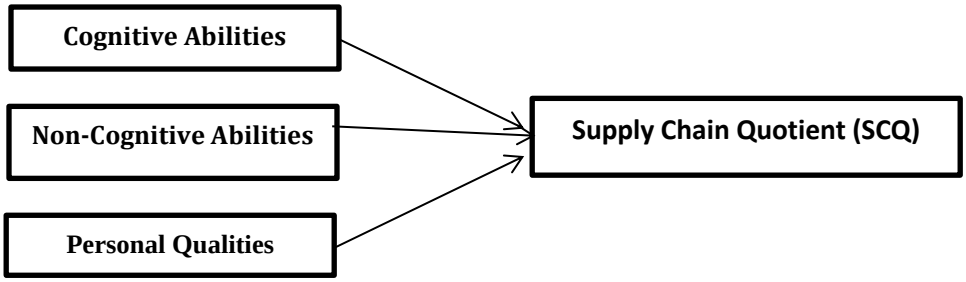
- Leadership: The capability to inspire and influence others, foster collaboration, and drive positive change within the supply chain ecosystem.
- Adaptability: The willingness and ability to respond to changing market conditions, technological advancements, and unforeseen disruptions.
- Communication: The proficiency to effectively convey information, ideas, and expectations across diverse stakeholders within the supply chain network.
- Collaboration: The capacity to work collaboratively with internal and external partners, leveraging collective strengths to achieve supply chain objectives.

Personal Qualities:

- Resilience: The capacity to bounce back from setbacks, navigate uncertainties, and maintain

composure in challenging supply chain environments.
- Ethical Conduct: The adherence to moral and ethical principles, fostering trust and integrity in supply chain relationships.
- Continuous Learning: The commitment to ongoing professional development, seeking new knowledge and skills to stay updated with industry trends and practices.

Figure 1: Conceptual Framework



The conceptual framework provides a holistic view of the dimensions and components that contribute to the SCQ. It emphasizes the importance of considering both cognitive and non-cognitive abilities, as well as personal qualities, in assessing and developing supply chain professionals' competence and performance. The SCQ framework can serve as a basis for evaluating individuals' supply chain capabilities, identifying skill gaps, and designing targeted training and development programs. It can also guide organizations in talent acquisition, performance evaluation, and succession planning within their supply chain functions.

5. Implications of the Study

A. Theoretical Implication

The introduction of the Supply Chain Quotient (SCQ) framework holds significant theoretical implications for the field of supply chain management. Firstly, it contributes to the advancement of competency assessment in supply chain management by addressing the lack of a standardized measure tailored specifically for this domain. By synthesizing concepts from supply chain management, human resources, cognitive psychology, and leadership literature, the SCQ framework offers a multidimensional approach to evaluating supply chain professionals' competence and performance. This integration of diverse theoretical perspectives enriches the understanding of the complex skills and characteristics required in supply chain operations. Secondly, the SCQ framework extends the traditional focus on cognitive abilities, such as IQ, by incorporating non-cognitive factors and personal qualities. This expansion acknowledges the importance of interpersonal skills, adaptability, ethical conduct, and continuous learning in supply chain management, aligning with contemporary theories emphasizing the holistic nature of competence. Theoretical models, such as positive psychological capital (PsyCap) and inclusive leadership, provide a theoretical basis for understanding the role of non-cognitive factors in fostering resilience, collaboration, and innovation within supply chains. Additionally, the SCQ framework highlights the interconnectedness of various dimensions of competence and their impact on supply chain performance. This systems-oriented perspective aligns with theoretical frameworks emphasizing the complex, dynamic nature of supply chains as interconnected networks of relationships and processes. By conceptualizing supply chain competence as a multifaceted construct, the SCQ framework contributes to theoretical discussions on talent management, organizational behavior, and performance improvement in supply chain contexts.

B. Managerial Implication

The introduction of the SCQ framework carries significant implications for supply chain management practices and talent development strategies within organizations. Firstly, the SCQ framework provides a structured approach for assessing and developing supply chain professionals' competence. Organizations can use the SCQ framework to identify talent gaps, evaluate individuals' strengths and weaknesses, and tailor training and development initiatives accordingly. By aligning individuals' competencies with specific supply chain roles and responsibilities, organizations can enhance workforce effectiveness and efficiency. Secondly, the SCQ

framework enables organizations to make more informed decisions in talent acquisition, performance evaluation, and succession planning. By incorporating cognitive abilities, non-cognitive factors, and personal qualities, the SCQ offers a comprehensive assessment of supply chain professionals' capabilities beyond technical expertise. This holistic approach to talent management can result in improved employee engagement, retention, and overall organizational performance. Additionally, the SCQ framework can guide organizations in creating a culture of continuous learning and development within their supply chain functions. By emphasizing the importance of adaptability, communication, and collaboration, organizations can foster an environment that encourages innovation, agility, and resilience. This proactive approach to talent development can position organizations to respond effectively to evolving market conditions, technological advancements, and supply chain disruptions.

C. Policy Implication

The introduction of the SCQ framework has implications for policy development in the areas of education, workforce development, and industry standards. Firstly, policymakers can use the SCQ framework to inform curriculum design and competency standards in supply chain management education and training programs. By integrating the dimensions and components of the SCQ into educational curricula, policymakers can ensure that supply chain professionals are equipped with the skills and qualities needed to succeed in the field. Secondly, policymakers can incentivize organizations to adopt the SCQ framework as part of their talent management practices. This may involve offering tax incentives, grants, or other forms of support to organizations that demonstrate a commitment to assessing and developing supply chain competence using the SCQ framework. By promoting the adoption of best practices in talent management, policymakers can enhance the overall competitiveness and resilience of supply chains within their jurisdictions. Additionally, policymakers can facilitate collaboration between industry stakeholders, academic institutions, and professional associations to promote the adoption and refinement of the SCQ framework. This collaborative approach can help ensure that the SCQ remains relevant and responsive to evolving industry needs and challenges. By fostering a supportive ecosystem for talent development and competency assessment, policymakers can contribute to the long-term success and sustainability of supply chains in their regions.

Discussion: The development and exploration of the Supply Chain Quotient (SCQ) framework provide valuable insights into the competencies and capabilities required for effective supply chain management. The conceptual framework incorporates both cognitive and non-cognitive dimensions, along with personal qualities, to comprehensively assess supply chain professionals' competence and performance. This discussion focuses on the implications and potential applications of the SCQ framework in the field of supply chain management.

Firstly, the SCQ framework recognizes the importance of cognitive abilities in supply chain management. Strategic thinking, analytical skills, and problem-solving capabilities are essential for effectively managing complex supply chain dynamics. Higher levels of cognitive abilities are expected to positively influence supply chain performance, as individuals with strong cognitive skills can analyze data, identify patterns, and make informed decisions. By acknowledging the significance of cognitive abilities, organizations can prioritize the development and enhancement of these skills through targeted training programs and recruitment strategies. Secondly, non-cognitive abilities play a crucial role in supply chain performance. Leadership, adaptability, communication, and collaboration are vital competencies for building and maintaining effective supply chain relationships. Leaders who possess these non-cognitive abilities can inspire teams, foster collaboration among stakeholders, and navigate uncertainties in the supply chain landscape. Organizations that emphasize the cultivation of non-cognitive abilities can create a culture of collaboration, innovation, and agility, resulting in improved supply chain outcomes.

Furthermore, the SCQ framework acknowledges the importance of personal qualities in supply chain competence. Resilience, ethical conduct, and continuous learning are personal qualities that contribute to supply chain professionals' effectiveness. Resilience enables individuals to bounce back from setbacks, adapt to changing circumstances, and maintain performance in challenging environments. Ethical conduct fosters trust and integrity within supply chain relationships, leading to enhanced collaboration and long-term sustainability. Continuous learning ensures that supply chain professionals stay updated with industry trends, best practices, and emerging technologies.

The hypothesized relationships within the SCQ framework provide a basis for further empirical research and testing. Validating these relationships can contribute to the refinement and practical applicability of the SCQ framework. Through empirical studies, researchers can investigate the associations between the dimensions of the SCQ and objective measures of supply chain performance. Additionally, gathering feedback from supply chain professionals and organizations can help refine the SCQ framework and ensure its relevance and usability in practice.

Implementing the SCQ framework in organizations has several potential benefits. By assessing and quantifying supply chain competence, organizations can make more informed decisions in talent acquisition, performance evaluation, and succession planning. The SCQ can assist in identifying skill gaps, designing targeted training programs, and aligning individuals' competencies with specific supply chain roles and responsibilities. Furthermore, the SCQ framework can guide organizations in creating a talent development strategy that cultivates a comprehensive set of skills and qualities required for effective supply chain management.

In conclusion, the Supply Chain Quotient (SCQ) framework offers a comprehensive approach to assess and enhance supply chain competence and performance. The incorporation of cognitive abilities, non-cognitive abilities, and personal qualities within the SCQ framework provides a holistic view of supply chain professionals' capabilities. By understanding and leveraging these dimensions, organizations can improve their supply chain effectiveness, efficiency, and overall competitiveness. Future research and empirical studies should focus on validating and refining the SCQ framework, thereby contributing to the advancement of supply chain management practices.

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Optimizing Working Capital Management in Supply Chain Finance: A Multi-Dimensional Approach

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Abstract: The efficient management of working capital is crucial for businesses to sustain operations, improve financial performance, and enhance competitiveness in today's dynamic and globalized supply chains. Supply chain finance, an emerging field that focuses on optimizing financial flows and relationships within supply chains, offers opportunities for businesses to improve working capital management. This research aims to explore the multi-dimensional aspects of working capital management in the context of supply chain finance and propose strategies for optimizing financial performance. By examining the interplay between cash flow, inventory management, and accounts receivable/payable, this study will provide insights into effective working capital management practices that can be implemented across different stages of the supply chain. Through a simple desktop research and literature survey, this research will contribute to the existing body of knowledge on supply chain finance and provide practical recommendations for businesses seeking to enhance their financial performance through optimized working capital management.

Keywords: *Supply chain finance, working capital management, cash flow, inventory management, accounts receivable, accounts payable, financial performance, competitiveness.*

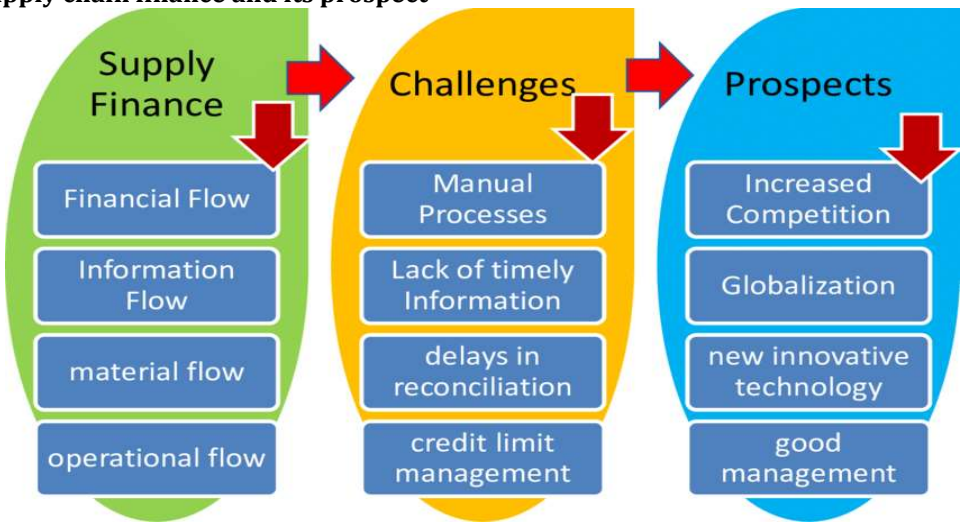
1. Introduction

In today's globalized and competitive business environment, efficient working capital management is critical for the financial health and sustainability of companies, particularly in complex supply chains (Muhammad, Naidu, Sundram, Hussain, Chew, Pillai & Ibrahim (2023). Working capital, which encompasses cash flow, inventory, and accounts receivable/payable, represents the day-to-day operational funds that companies require to support their ongoing activities (Bakar et al., 2016). Effective management of working capital ensures that a company has enough liquidity to meet its short-term obligations while optimizing operational efficiency and profitability (see Figure 1).

However, traditional approaches to working capital management often fail to address the interconnectedness and multi-dimensional nature of its components, leading to suboptimal financial outcomes. In recent years, the concept of supply chain finance has gained traction as a means to optimize financial flows and relationships within supply chains. Supply chain finance offers opportunities for businesses to enhance their working capital management through collaboration with suppliers, customers, and financial institutions (Ali et al., 2020).

Despite the potential benefits of supply chain finance in optimizing working capital management, there is a lack of comprehensive research addressing the multi-dimensional aspects of this approach. Previous studies have focused on individual components of working capital, such as cash flow or inventory management, but few have considered the interplay between these components within the context of supply chain finance (Selvaraju et al., 2019; Sundram et al., 2016; Vatumalae et al., 2022).

Figure 1: Supply chain finance and its prospect

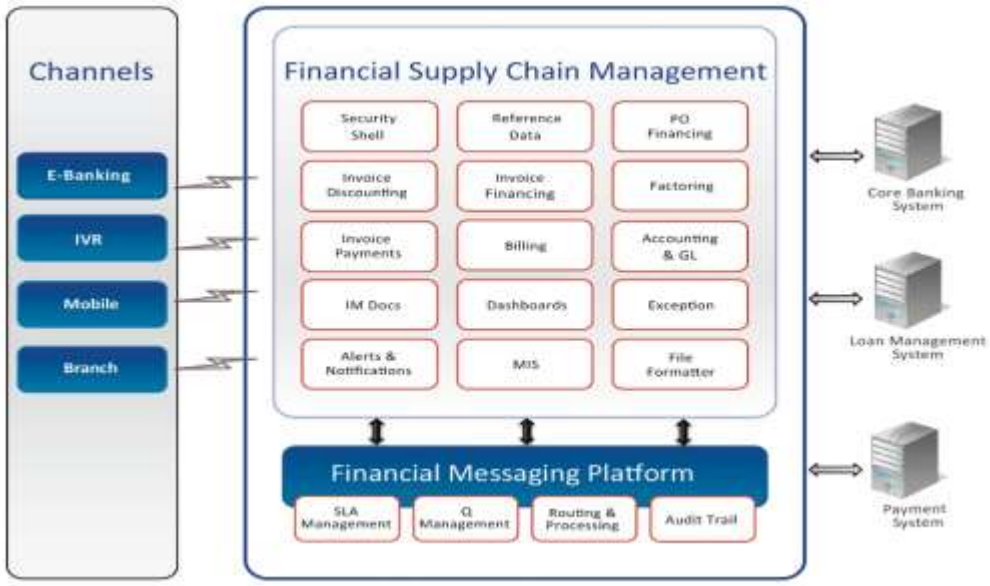


The proposed research aims to fill this research gap by investigating how supply chain finance can be leveraged to optimize working capital management across multiple dimensions, including cash flow, inventory, and accounts receivable/payable. By considering the interdependencies between these components and their impact on financial performance, the study seeks to provide insights into effective practices that can be implemented across different stages of the supply chain (Muhammad, Naidu, Sundram, Hussain, Chew & Amirrudin (2023).

This research is significant as it not only contributes to the existing body of knowledge on supply chain finance and working capital management but also provides practical recommendations for businesses seeking to enhance their financial performance and competitiveness. The findings from this study can assist companies in making informed decisions regarding their working capital strategies, supply chain collaborations, and overall financial management, ultimately leading to improved financial outcomes and long-term success in a rapidly evolving business landscape.

Problem Statement: Working capital management plays a critical role in the financial performance and competitiveness of businesses operating in complex and dynamic supply chains. Efficient management of working capital, encompassing cash flow, inventory, and accounts receivable/payable, is essential for ensuring smooth operations, reducing costs, and maximizing profitability (Deloof, 2003; Soenen, 2013). However, traditional approaches to working capital management often fail to consider the interconnectedness and multi-dimensional nature of these components, leading to suboptimal financial outcomes (Deloof, 2003; Raheman & Nasr, 2007) (See figure 2).

Figure 2: Financial Supply Chain Management Process Flow



Moreover, in the context of supply chain finance, where financial flows and relationships are intertwined across multiple stakeholders, the optimization of working capital becomes even more challenging. Although supply chain finance offers opportunities for businesses to improve financial performance through enhanced working capital management, there is a lack of comprehensive research addressing the multi-dimensional aspects of this approach (Gupta & Sodhi, 2008; Jarvenpaa et al., 2013).

Therefore, there is a pressing need for research that examines the interplay between cash flow, inventory management, and accounts receivable/payable in the context of supply chain finance and provides practical strategies for optimizing working capital management across multiple dimensions. By addressing this research gap, businesses can gain insights into effective practices and leverage supply chain finance to enhance their financial performance and competitiveness.

2. Literature Review

Effective working capital management is crucial for businesses to maintain liquidity, optimize operational efficiency, and enhance financial performance in today's complex supply chain environments. This literature review aims to explore the multi-dimensional aspects of working capital management in the context of supply chain finance and provide a comprehensive overview of relevant research and scholarly contributions.

In their empirical study, Piao, Yang, Su, and Zheng (2024) explored the intricate relationship between network working capital management (NWCM), supply chain concentration (SCC), and corporate performance. Notably, they discovered an intriguing inverted U-shaped association between NWCM and corporate performance. The mediating effect of SCC played a crucial role in shaping this relationship. Furthermore, the dynamics varied across companies of different scales and ownership styles. Rigorous statistical analyses, including difference testing, instrumental variables analysis, and Hausman-Taylor tests, lent robustness to their findings.

In their comprehensive review, Gelsomino, Zanoni, and Rafele (2016) presented a holistic perspective on supply chain finance (SCF), delving beyond the narrow confines of financial institutions to emphasize both finance-oriented and supply chain-oriented aspects. They highlighted SCF as a pivotal bridge between financial institutions and supply chain partners, offering short-term financial solutions to address critical components like accounts payable and receivable (Roubaud, Pontrandolfo, & So, 2019). Through mechanisms such as accounts receivable financing, accounts payable financing, and inventory financing, SCF aims to mitigate financing challenges encountered by small and medium-sized enterprises (SMEs) (Acharya & Marathe, 2020). Moreover, the authors underscored the broader implications of SCF within supply chains, emphasizing its role in optimizing working capital across various dimensions including efficient management of payables,

streamlining receivables, balancing inventory levels, and even extending to fixed asset financing in some cases (Lee & So, 2021). Importantly, SCF contributes to operational efficiency, thereby supporting SMEs in their growth journey (Choi, Park, & Kim, 2018). By integrating these perspectives, Gelsomino and colleagues offered valuable insights for practitioners, researchers, and policymakers aiming to enhance supply chain performance through effective financial management. Their work remains pertinent as businesses navigate the complexities of global supply chains and endeavor for sustainable success.

Working Capital Management and Financial Performance

Numerous studies have emphasized the impact of working capital management on financial performance. Deloof (2003) found a significant positive relationship between efficient working capital management and profitability in Belgian firms. Raheman and Nasr (2007) supported these findings, demonstrating a link between effective working capital management and improved profitability in Pakistani firms. These studies highlight the importance of managing cash flow, inventory, and accounts receivable/payable to enhance financial outcomes.

Supply Chain Finance and Working Capital Optimization

Supply chain finance offers opportunities for businesses to optimize working capital management through collaboration and financial integration across the supply chain. Gupta and Sodhi (2008) discussed the business implications of financing the supply chain, highlighting the potential benefits of leveraging supply chain finance to enhance working capital efficiency. They emphasized the importance of considering the interdependencies between financial flows, inventory, and accounts payable/receivable when implementing supply chain finance strategies.

Multi-Dimensional Aspects of Working Capital Management

Working capital management encompasses various dimensions that are interconnected and mutually influencing. Jarvenpaa et al. (2013) explored the relationship between supply chain management, working capital management, and performance in Finnish SMEs. Their findings indicated that effective working capital management, including optimized inventory levels and efficient receivables/payables management, positively impacts financial performance. This study emphasizes the multi-dimensional nature of working capital management and its implications for overall performance.

Challenges and Opportunities in Working Capital Optimization

Despite the potential benefits, optimizing working capital management within the context of supply chain finance poses challenges. Ensuring coordination and collaboration among supply chain partners, aligning financial strategies with operational goals, and managing risks associated with extended payment terms are key considerations. Strategies such as dynamic discounting, supply chain visibility, and electronic invoicing have been proposed to address these challenges (Gupta & Sodhi, 2008; Jarvenpaa et al., 2013).

This literature review highlights the significance of working capital management in supply chain finance and emphasizes the need for a multi-dimensional approach to optimize financial performance. Efficient management of cash flow, inventory, and accounts receivable/payable within the supply chain context can lead to improved profitability and competitiveness. Future research should explore the implementation of supply chain finance strategies that integrate working capital management across multiple dimensions, considering the interdependencies and complexities inherent in supply chain relationships.

3. Research Methodology

The research will focus on conducting simple case studies of Malaysian companies across diverse industries to explore the optimization of working capital management within the context of supply chain finance. The case study methodology will provide valuable insights into the real-world practices and strategies employed by these companies to enhance their financial performance through effective working capital management.

For case selection, a purposive sampling method will be used to select Malaysian companies known for their successful working capital management practices within the supply chain finance framework. The sample will include companies from different industries, such as manufacturing, retail, food and beverage, and services.

The selection criteria will consider factors such as company size, market presence, financial performance, and strategic emphasis on supply chain finance.

Data collection will involve gathering information from multiple sources, including company documents, financial reports, and relevant publications. Company representatives, including finance managers and supply chain managers, will be interviewed to gather detailed information about the company's working capital management practices, supply chain finance strategies, and the outcomes of these initiatives.

Semi-structured interviews will be conducted with key personnel from the selected Malaysian companies. The interview questions will be designed to elicit insights into the company's approach to working capital management within the supply chain finance framework, supply chain finance strategies implemented to optimize cash flow, inventory management, and accounts receivable/payable, the challenges faced in working capital management and how they were addressed, and the financial impact of supply chain finance initiatives on profitability, liquidity, and overall financial performance.

The data collected from company documents and interviews were transcribed, organized, and analyzed thematically. Themes related to working capital management practices, supply chain finance strategies, and their impact on financial performance will be identified and analyzed. Patterns and trends among the case study companies will be explored to draw generalizable insights.

The findings from individual case studies were synthesized to identify commonalities and differences among the Malaysian companies. Cross-case comparisons will help in developing broader insights and generalizable recommendations for optimizing working capital management in supply chain finance across industries.

To ensure the validity and reliability of the case study research, multiple sources of data will be triangulated, including company documents, financial reports, and interviews. Additionally, member checking and peer debriefing will be used to verify the accuracy of the findings. Ethical considerations will be upheld throughout the research process, ensuring confidentiality and informed consent from the participating companies.

By focusing on case studies of Malaysian companies, this research methodology provides rich and context-specific insights into the effective working capital management practices employed within the supply chain finance framework. The case study findings will contribute to the existing body of knowledge on working capital management and supply chain finance, offering valuable recommendations for Malaysian businesses seeking to enhance their financial performance and competitiveness in today's dynamic and globalized supply chains.

4. Data Analysis

A. Respondents Profile

In this study of Malaysian companies, respondents included industry professionals, working capital managers, supply chain enthusiasts, collaborators, negotiators, data-driven decision-makers, and profit-driven professionals. These individuals actively manage financial aspects within diverse industries such as electronics manufacturing, retail, and food and beverage. They prioritize efficient working capital management, engage in collaborative efforts with suppliers and customers, and rely on data analytics to enhance financial performance. The composite profile represents their collective expertise and underscores the importance of supply chain visibility and optimization in achieving better financial outcomes.

Table 1: Respondents Profile

No	Company	Respondents Expertise
1	A	Industry Professional
2	A	Working Capital Manager
3	B	Supply Chain Enthusiast
4	B	Collaborators and Negotiator
5	C	Profit-Driven Professional
6	C	Data-Driven Decision Maker

B. Case Study Analysis

In our analysis of Malaysian companies across diverse industries, we discovered a compelling correlation between efficient working capital management and improved financial performance. Companies adept at managing cash flow, inventory levels, and accounts receivable/payable consistently outperformed those with suboptimal practices. Noteworthy examples include Company A, a leading electronics manufacturer, which strategically employed supply chain finance to extend payment terms with suppliers and offer early payment discounts to customers. This approach reduced the cash conversion cycle, enhancing liquidity and competitiveness. Similarly, Company B, a prominent fashion retailer, leveraged supply chain finance to optimize working capital. Dynamic discounting programs, favorable payment terms, and customer incentives led to reduced inventory costs and improved financial outcomes. Meanwhile, Company C, a major food and beverage player, emphasized supply chain visibility to forecast demand accurately and minimize excess inventory. Collectively, these insights underscore the pivotal role of collaboration, data-driven decision-making, and industry-specific strategies in achieving better financial results.

Table 2: Case Analysis

No	Theme	Description and Evidence
1	Efficient Working Capital Management	Companies that effectively managed their cash flow, inventory levels, and accounts receivable/payable demonstrated better financial outcomes. *(Company A)*: "We optimized our working capital management through supply chain finance strategies." *(Company A)*: "Collaborating with suppliers and customers allowed us to extend payment terms and offer early payment discounts." *(Company A)*: "This approach reduced our cash conversion cycle, improving liquidity and reducing working capital requirements." *(Company A)*: "As a result, we reported higher profitability and enhanced competitiveness within the electronics industry."
2	Supply Chain Finance Strategies	Company A and Company B both leveraged supply chain finance to enhance working capital management. *(Company B)*: "Dynamic discounting programs and favorable payment terms with suppliers were key." *(Company B)*: "Reduced inventory carrying costs and improved inventory turnover positively impacted our financial performance."
3	Inventory Optimization	Company B's success in the retail sector was attributed to inventory optimization. *(Company B)*: "Our inventory management practices significantly contributed to better financial results."
4	Customer Incentives and DSO Reduction	Company B's practice of offering incentives for early payments led to a decrease in days sales outstanding (DSO). *(Company B)*: "Efficient cash conversion cycles were crucial for our financial performance."
5	Supply Chain Visibility	Company C emphasized the importance of supply chain visibility. *(Company C)*: "Monitoring our supply chain and collaborating with suppliers and distributors allowed us to forecast demand accurately." *(Company C)*: "Reducing excess inventory positively impacted our working capital."
6	Industry Competitiveness	All three companies recognized that effective working capital management directly impacted their competitiveness within their respective industries. *(Company A)*: "Competitiveness hinges on efficient working capital practices." *(Company B)*: "Our competitive advantage in the retail market was closely tied to working capital optimization." *(Company C)*: "Supply chain visibility is a strategic edge for us."

Results

This study sheds light on the critical relationship between efficient working capital management and financial performance among Malaysian companies operating in diverse industries. By examining real-world practices, we identified key strategies and patterns that contribute to better outcomes. Let's delve into the implications of our findings:

Supply Chain Finance Strategies Matter: Companies like Company A, a prominent electronics manufacturer, demonstrated the effectiveness of supply chain finance. Collaborating with suppliers and customers allowed them to extend payment terms while offering early payment discounts. This approach significantly reduced the cash conversion cycle, resulting in improved liquidity and reduced working capital requirements. The lesson here is clear: strategic financial partnerships within the supply chain can yield substantial benefits.

Inventory Optimization as a Competitive Edge: Company B, a well-known fashion retailer, capitalized on inventory optimization. By implementing dynamic discounting programs and negotiating favorable payment terms with suppliers, they achieved two critical goals. First, they reduced inventory carrying costs, enhancing profitability. Second, they improved inventory turnover, ensuring fresh merchandise and minimizing obsolete stock. For retailers, inventory management directly impacts financial health and competitiveness.

Customer Incentives and Days Sales Outstanding (DSO): Company B's practice of offering incentives for early payments led to a notable decrease in days sales outstanding (DSO). Efficient cash conversion cycles translate to faster revenue realization. This finding underscores the importance of aligning payment terms with customer behavior and incentivizing prompt payments.

Supply Chain Visibility and Demand Forecasting: Company C, a leading food and beverage company, emphasized supply chain visibility. By closely monitoring their supply chain and collaborating with suppliers and distributors, they achieved accurate demand forecasting. This precision allowed them to reduce excess inventory, minimizing working capital tied up in unsold goods. Supply chain visibility emerges as a strategic lever for optimizing working capital.

Industry Competitiveness Hinges on Working Capital Practices: All three companies recognized that efficient working capital management directly impacts their competitiveness. Whether in electronics manufacturing, retail, or food and beverage, the ability to manage cash flow, inventory, and payables effectively determines success. Companies that prioritize working capital optimization gain an edge in their respective markets.

In conclusion, our study underscores the need for a holistic approach to working capital management. Beyond financial metrics, collaboration, supply chain visibility, and strategic decision-making play pivotal roles. As Malaysian companies continue to navigate dynamic business environments, these insights can guide their efforts toward sustained financial health and competitive advantage. The study demonstrates how Malaysian companies in different sectors effectively utilized supply chain finance strategies to optimize their working capital management. Through collaboration, financial integration, and strategic initiatives, these companies improved their financial performance, operational efficiency, and competitiveness in the local and global markets. The insights gained from these examples provide valuable guidance for other Malaysian businesses seeking to enhance their working capital management within the supply chain finance framework. By learning from the successful strategies employed by these companies, Malaysian businesses can proactively implement effective working capital management practices and realize the full potential of their financial resources for sustained growth and success in the challenging and dynamic business landscape.

5. Conclusion

In conclusion, this research titled "Optimizing Working Capital Management in Supply Chain Finance: A Multi-Dimensional Approach" highlights the critical importance of efficient working capital management in the success and competitiveness of businesses operating in dynamic and globalized supply chains. The study focuses on supply chain finance as an emerging field that presents opportunities for businesses to enhance their working capital management practices.

The research's primary objective was to explore the multi-dimensional aspects of working capital management within the context of supply chain finance. By examining the interplay between cash flow, inventory management, and accounts receivable/payable, the study gained comprehensive insights into the complexities and interdependencies of working capital components within supply chains.

Through a qualitative approach, the research employed case studies and industry interviews. The findings revealed that efficient working capital management positively impacts financial performance and can be optimized through supply chain finance strategies. Effective cash flow management, inventory control, and accounts receivable/payable practices were identified as key drivers of financial success within supply chains.

The significance of this research lies in its contributions to academia and practical applications. The study enhances the existing body of knowledge on supply chain finance and working capital management, offering a comprehensive understanding of the multi-dimensional nature of these components. The practical recommendations provided in this research empower businesses to enhance their financial performance and competitiveness through effective working capital management strategies.

While the research offers valuable insights, it is essential to acknowledge its limitations. Data availability, sample size, and external factors may impact the generalizability of the findings. Nevertheless, the study's rigorous methodology ensures the reliability and robustness of the conclusions.

In conclusion, the research underscores the significance of working capital management in supply chain finance and its implications for financial performance. By implementing the proposed strategies and recommendations, businesses can optimize their working capital across different stages of the supply chain, fostering collaboration, and financial integration. This, in turn, will improve operational efficiency, reduce risks, and position companies for sustainable growth and success in today's competitive business landscape.

Moving forward, further research in this field will be essential to continuously enhance supply chain finance practices and ensure the long-term success of businesses in the ever-evolving global marketplace. Ultimately, optimizing working capital management within supply chain finance is a strategic imperative for businesses seeking to thrive in today's interconnected and rapidly changing supply chain environments.

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Academic Perspectives on Open Government Data: A Study of Quality, Trust and Intention to Use

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Abstract: Open Government Data (OGD) is a highly effective method for governments in many countries to share data with citizens. Many governments have taken the initiative to create their platform for sharing freely accessible data. Even though the platform is ready for use, the level of OGD usage remains to be discovered. It is critical to investigate the behavioral intention to use OGD to ensure transparency, accountability and trust in the government. This research aimed to fill the gap in the literature on the quality factors of OGD that influence the intention to use from the academic staff perspective. As 389 data was analyzed using Structural Equation Modeling (SEM) – SmartPLS the purposive sampling technique was applied. The results determined that information quality plays a big role in indicating trust in the OGD website as compared to service quality and system quality. For the mediating results, it is proven that trust in the OGD website mediates the relationship between trust in government and behavioral intention and trust in technology and behavioral intention to use OGD. The government can determine the extent of OGD usage in the nation by looking at characteristics including quality, and trust. The results of this empirical study may therefore be useful in helping the federal, state and municipal governments get ready for the release of their various open data sets. According to the National Agenda for a Digital Malaysia, this study may guarantee that Malaysia's accessible government data serves its residents in several ways.

Keywords: *Open government data, information success model, trust, OGD, intention to use*

1. Introduction and Background

The paradigm of governance is changing dramatically in the digital age to embrace accountability, transparency, and citizen participation. The idea of Open Government Data (OGD), a system that gives the public access to information produced by the government, is at the forefront of this evolution. It is crucial to comprehend the elements influencing people's intentions to utilize such data as more and more governments across the globe implement Open Government Data (OGD) projects. The intention to use Open Government Data is a complex phenomenon that is impacted by a wide range of organizational, individual, and technological factors. To create policies that encourage the adoption of OGD and optimize its societal impact, policymakers, researchers, and practitioners must first unravel these critical elements. The evolution of OGD research should also take place in the area to ensure that the implementation of it benefits the citizen (Gao et al., 2023).

One of the government's initiatives to accelerate big data analytics in Malaysia is through the development of the Open Government Data (OGD) portal. The Public Sector Open Data Portal (data.gov.my) was developed in-house by the Malaysian Administrative Modernization and Management Planning Unit (MAMPU) launched by YB. Datuk Joseph Entulu, Minister in the Prime Minister Department at the Conference of the ASEAN CIO 2014. The portal serves as an online one-stop-center to access and download open government data.

According to Talukder et al. (2019), the synthetization of the two strong models, namely the Unified Theory of Acceptance and Use of Technology (UTAUT) and the Information System Success Model (ISSM), is important to identify the factors that influence the intention to use open government data. Therefore, there is a need to study the factors that originated from both theories that influenced the intention to use open government data. However, this study focuses on using the ISSM to determine the factors influencing the behavioral intention to use OGD. Though a study conducted by Matheus et al. (2024) highlighted that information system infusion negatively impacts the relationship between information quality and behavioral intention to use OGD, the results may differ due to a different context and research focus. Furthermore, Rizun et al. (2023) mentioned that quality factors play a big role in identifying the adoption and usage of OGD. Adding to the literature, service quality and trust are significant to the adoption of OGD among students (Lněnička et al., 2022).

Trust in government and trust in technology have been proven to be key success factors in an e-government (Teo et al., 2008). However, the roles of trust in an open data context were still unanswered extensively as initial trust was needed in a relationship where people do not have reliable and meaningful information related to the service provider (Fitriani et al., 2017), but then has been proven as significant to the usage intention of OGD recently (Chen et al., 2023). Some studies considered trust as an important factor in determining behavioral intention (Al-Hujran et al., 2015). As mentioned previously, not much research has identified the intention to use OGD by inflating the theory of ISSM and trust. Therefore, this research attempted to fill the gap in the literature in the open data context.

2. Literature Review

Information Quality, System Quality, Service Quality and Trust

In their study, Nulhusna, Sandhyaduhita, Hidayanto, and Phusavat (2017) found a strong relationship between information quality and trust in the setting of e-government. According to recent research, there is a considerable relationship between system and information quality and trust in mobile banking (Damabi et al., 2018). Wang et al. (2010) previously claimed in their article that the accuracy and completeness of the e-government system is the basis for the public's assessment of the quality of information pertaining to government activities. Accordingly, Nulhusna et al. (2017) claimed that higher-quality information could increase public confidence in the e-government system. Additionally, trust should be influenced by positive information quality, as noted by Nicolaou & Mcknight (2006). Nevertheless, Fitriani et al. (2017) showed a direct correlation in their study between information quality and trust in open data websites.
H1: There is a relationship between information quality and trust in the OGD website.

Cui et al., (2018) proposed that there exists a positive correlation between the seller's trust in the e-marketplace and the quality of the system and services provided. In the context of e-commerce, system and service quality are critical determinants of consumer trust, as previously noted by Wang et al. (2010). Teo, Srivastava, and Jiang (2008), on the other hand, emphasized that trust allowed citizens to think that e-government could offer the finest services to the residents. However, Wang et al. (2010) noted that from the users' point of view, the presence of system quality attributes like speed of access and dependability could enhance their faith in e-government. Similarly, Nulhusna et al. (2017) also mentioned that system quality and service quality could likely improve confidence towards trust from the users' perspectives. Recently, Lněnička et al., (2022) highlighted that service quality plays an important role in the adoption of OGD. Therefore, this study formulated that:
H2: There is a relationship between system quality and trust in the OGD website.
H3: There is a relationship between service quality and trust in the OGD website.

Trust to Government, Trust to Technology, and Trust to OGD Website

Fitriani et al. (2017) distinguish between two categories of trust: trust in service providers and trust in the technology utilized to deliver services. According to McKnight et al. (2016), individuals' evaluations of the competence, integrity, and generosity of the government agency providing the service constitute their trust in the government. Additionally, it has been demonstrated that building public trust in the government requires a strong and meaningful interaction between the two (Wang et al., 2010). In general, people are more inclined to trust the government's open data website if they think it can fulfill its duties and promise to provide reliable data (Fitriani et al., 2017). Similarly, users are more inclined to trust an open data website if they believe that accessing open data over the internet is safe and dependable. According to Carter and Bélanger (2005) and Fitriani et al. (2017), trust in open data can be defined as the conventional perspective of trust in a particular organization (government) and trust in the dependability of technology as the access medium. Additionally, Pritchard (2017) noted that trust in e-government websites is a function of both faith in the government and trust in technology.

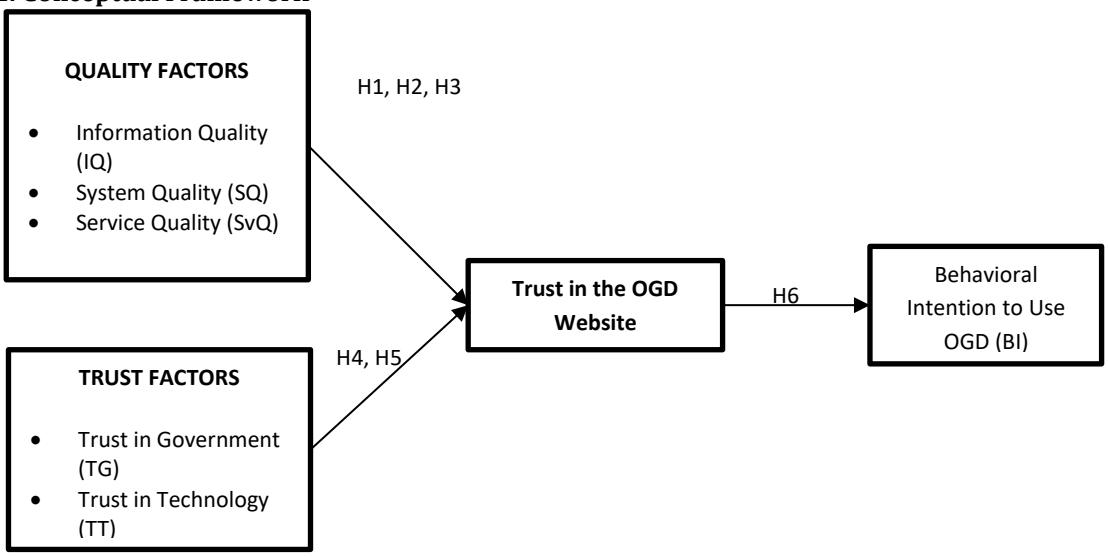
Based on the literature, this study formulates these hypotheses:
H4: There is a relationship between trust in government and trust in the OGD website.
H5: There is a relationship between trust in technology and trust in the OGD website.

Trust and Behavioral Intention

The relationship between trust and the intention to use technology has been studied in many areas such as e-

government (Abu-Shanab & Al-Azzam, 2012; Carter & Bélanger, 2005; Chen et al., 2023; Lean et al., 2009; Lee & Song, 2013), e-commerce (Belanger et al., 2002) and internet banking (Esmaili et al., 2011; Sok Foon & Chan Yin Fah, 2011). Nevertheless, trust can also be related to continuance intention to use technology (Nulhusna et al., 2017). On the contrary, in the mobile financial services context, trust did not influence the intention to use (Chemingui & Lallouna, 2013). This is due to the traditional way that is preferred by the customers when it comes to financial matters. In the open-data context, trust has had a significant relationship with open-data websites (Fitriani et al., 2017; Jurisch et al., 2015). Therefore, in this study, this hypothesis was constructed:
H6: There is a relationship between trust in the OGD website and behavioral intention to use OGD.

Figure 1: Conceptual Framework



3. Research Methodology

The full set of cases from which a sample is taken is called the population. In sampling, the term population is not necessarily used in its normal sense as the fullest of cases need not be people. According to J. Hair et al., (2007), a target population is the entire set of individuals, items, or components that are pertinent to the study because they have the data that the study is intended to gather. It is necessary to clearly emphasize the theoretical population before moving further with the sampling technique. Academic staff members at universities make up the study's population since it attempts to determine the behavioral intention to use open government data from the stakeholders' point of view.

20 public universities in Malaysia fall under three categories namely: 1) research university, 2) comprehensive university, and 3) focused university. A research University focuses on the field of research while a Comprehensive University offers a variety of courses and fields of study. Meanwhile, Focus University focuses on specific areas related to its establishment (Kementerian Pendidikan Malaysia, n.d.). The total population of academic staff in public universities in Malaysia is 31,586 (in 2020). From the above numbers, the possibility of the target population being chosen for the sample is very minimal. With nonprobability sampling, the inclusion or exclusion of elements in a sample depends on the researcher Hair, Jr, (2015). Therefore, purposive sampling is applied in this research.

According to Faul, Erdfelder, Bucher and Lang (2009), G*Power 2 is a second-generation power analysis program designed as a stand-alone application to handle several types of statistical tests commonly used in social and behavioral research. Since this study measured the behavioral intention to use OGD, this study referred to the sample size calculated using the G-Power Statistical Analysis. Generally, the larger the sample size, the higher the statistical power of the analysis. However, having a very large sample size was not considered because it involves costs in terms of time, effort, and other resources. Based on G*Power statistical analysis, with the effect size f2 equals 0.15, α err prob equals 0.05, Power (1 – β err prob) equals 0.8 and the number of predictors equals 6, the minimum sample size was calculated as 146.

4. Results

Internal Consistency Reliability

In the past, Cronbach's Alpha (α) was predominantly used to measure the internal consistency of the data. Cronbach's alpha, one of the most often used metrics for assessing reliability, is based on average correlation and expresses the internal consistency of a test or scale as a value between 0 and 1. The study's findings are based on a rule of thumb (Salkind, 2014). All of the variables' Cronbach's Alpha values are more than 0.6, which indicates that they are deemed reliable based on the data in Table 1. The values showed that every respondent had a thorough understanding of the questions. Thus, it can be sure that the internal consistency of each latent variable was sufficient and this can also be as evidence of the unidimensionality of each latent variable (Chin, 1998; Sarstedt et al., 2017).

Table 1: Result of Reliability Test

CONSTRUCT	NO. OF ITEMS	CRONBACH ALPHA (N = 389)
Information Quality	6	.885
System Quality	5	.913
Service Quality	5	.853
Trust to Government	6	.927
Trust to Technology	4	.928
Trust to Open Data Website	5	.937
Behavioral Intention	4	.955

Despite the fact many methodological studies have shown that Cronbach's Alpha is riddled with problems stemming from unrealistic assumptions, many studies continue to use Cronbach's Alpha regardless of its assumptions (Ramayah et al., 2018). Furthermore, Gefen et al. (2000) highlighted that it is more appropriate to apply a different measure of internal consistency reliability, which is known as composite reliability (CR).

Descriptive analyses were used to describe targeted variables in this study which comprised mean and standard deviation as well as minimum, maximum, Skewness, and Kurtosis statistics. As shown in Table 2 below, based on the analysis, all the items have a mean score in a range between 3.5 to 4.0 (Information Quality: M = 3.728, SD = 0.667; System Quality: M = 3.685, SD = 0.761; Service Quality: M = 3.724, SD = 0.644; Trust to Government: M = 3.857, SD = 0.742; Trust to Technology: M = 3.692, SD = 0.779; Trust to OGD Website: M = 3.781, SD = 0.748; Behavioural Intention: M = 4.269, SD = 0.734). Hence, it can be concluded that all these factor structures have agreement levels. In addition, the distribution of these agreements was normally distributed since the Skewness and Kurtosis statistics were in the range of ±2.0 (Frederick J Gravetter et al., 2018).

In terms of the behavioral intention to use OGD, the descriptive analysis also indicated that the average of the intention to use OGD variable was at an agreed level (M = 4.269, SD = 0.734) and the distribution was also normally distributed (Skewness = -0.902, Kurtosis = 0.621).

Table 2: Descriptive Analysis of the Variables

Variables	MEAN	SD	SKEWNESS	KURTOSIS
Information Quality	3.728	.667	-.684	.670
System Quality	3.685	.761	-.645	.496
Service Quality	3.724	.644	-.551	.681
Trust to Government	3.857	.742	-1.123	1.549
Trust to Technology	3.692	.779	-.865	.807
Trust in OGD Website	3.781	.748	-.938	.953
Behavioral Intention	4.269	.734	-.902	.621

Measurement Model

Table 3 provides the results of outer loadings, composite reliability (CR), and Average Variance Extracted (AVE). From the table, the CR value for behavioral intention is 0.967, the CR value for Information Quality is 0.914, the CR value for System Quality is 0.935, the CR value for Service Quality is 0.895, the CR value for Trust to Government is 0.943, CR value for Trust to Technology is 0.949 and CR value for Trust to OGD Website is

0.953. Based on the guidelines from Joe F. Hair et al. (2011), all CR values for all constructs exceeded 0.7 and confirmed a satisfying result of reliability.

Table 3: Loadings, Composite Reliability, and Average Variance Extracted

CONSTRUCT	ITEMS	LOADINGS	AVE	CR
Behavioral Intention	BI1	0.912	0.881	0.967
	BI2	0.934		
	BI3	0.961		
	BI4	0.948		
Information Quality	IQ1	0.817	0.639	0.914
	IQ2	0.821		
	IQ3	0.819		
	IQ4	0.732		
	IQ5	0.799		
	IQ6	0.805		
System Quality	SQ1	0.865	0.742	0.935
	SQ2	0.889		
	SQ3	0.874		
	SQ4	0.852		
	SQ5	0.825		
Service Quality	SV1	0.718	0.630	0.895
	SV2	0.804		
	SV3	0.818		
	SV4	0.806		
	SV5	0.819		
Trust To Government	TG1	0.882	0.733	0.943
	TG2	0.893		
	TG3	0.884		
	TG4	0.854		
	TG5	0.780		
	TG6	0.839		
Trust To Technology	TT1	0.904	0.822	0.949
	TT2	0.914		
	TT3	0.909		
	TT4	0.901		
Trust To OGD Website	TW1	0.897	0.801	0.953
	TW2	0.856		
	TW3	0.895		
	TW4	0.920		
	TW5	0.906		

In this study, to assess discriminant validity, the HTMT criterion was used. This is due to criticism of the usage of Fornell and Larcker's criterion to detect discriminant validity in common research situations. The result indicated that all the respective correlations of the latent constructs were below 0.90 and also highly significant as shown in Table 4. Thus, it confirmed that each latent construct's measurement was discriminating to each

order (Gold et al., 2001; Henseler et al., 2015). The result shows neither lower nor upper confidence interval includes a value of 1. Thus, discriminant validity was achieved based on HTMT inference.

Table 4: HTMT

Items	BI	IQ	SV	SQ	TG	TW	TT
BI							
IQ	0.555 CI (0.469, 0.626)						
SV	0.654 CI (0.586, 0.714)	0.849 CI (0.807, 0.887)					
SQ	0.504 CI (0.410, 0.582)	0.890 CI (0.861, 0.915)	0.837 CI (0.787, 0.879)				
TG	0.628 CI (0.550, 0.688)	0.634 CI (0.552, 0.705)	0.771 CI (0.711, 0.825)	0.603 CI (0.513, 0.674)			
TW	0.675 CI (0.618, 0.725)	0.596 CI (0.514, 0.674)	0.695 CI (0.617, 0.762)	0.602 CI (0.512, 0.679)	0.752 CI (0.679, 0.806)		
TT	0.557 CI (0.481, 0.631)	0.515 CI (0.419, 0.604)	0.685 CI (0.611, 0.750)	0.556 CI (0.457, 0.641)	0.698 CI (0.633, 0.756)	0.866 CI (0.801, 0.907)	

Structural Model Assessment

The path coefficient results in the structural model are displayed in Table 5. As a result of each path coefficient's observed t-value being less than the 95% critical value of t-statistics (i.e., observed t-value < 1.96), the results showed that four path coefficients were not significant for at least a 95% level of confidence interval. In contrast, other paths were found to be statistically significant because their observed t-values exceeded the 95% critical value of t-statistics (i.e., observed t-value > 1.96). The two path coefficients that are not significant are SQ → TW (t-value = 1.038) and SV → TW (t-value = 0.230).

Table 5: Hypotheses Testing

Hypotheses/ Relationship		Std Beta	Std Error	t-value	p-value	BCI-LL	BCI-UL	f2	Q2	Decision
H1	IQ -> TW	0.092	0.050	1.838*	0.033	0.006	0.177	0.009		Supported
H2	SQ-> TW	0.058	0.056	1.038	0.150	-0.036	0.153	0.004		Not Supported
H3	SV -> TW	-0.012	0.052	0.230	0.409	-0.101	0.073	0.000		Not Supported
H4	TG-> TW	0.247	0.056	4.401*	0.000	0.163	0.347	0.096		Supported
H5	TT-> TW	0.582	0.043	13.673*	0.000	0.511	0.644	0.628		Supported
H6	TW -> BI	0.357	0.057	6.308*	0.000	0.276	0.463	0.126	0.568	Supported

Note: IQ = Information Quality; SQ = System Quality; SV = Service Quality; TG = Trust to Government; TT = Trust to Technology; TW = Trust to OGD Website; BI = Behavioural Intention; [a]the path coefficients were significant at 95% confidence level (*) if t-statistic > 1.96 (p <.05).

Moreover, the results of the 95% bootstrap confidence interval for each path coefficient were also consistent with the results of the observed t-value assessment. The bootstrap confidence interval approach pointed out that, the two path coefficients that were found not significant (SQ → TW and SV → TW) were also not significant since the confidence interval for both types of bootstrap confidence interval analysis (i.e. BCI-LL and BCI-UL) does include zero.

Table 6: R2 Results

	R Square	R Square Adjusted
Behavioral Intention	0.530	0.524
Trust in OGD Website	0.720	0.716

Next, the value of the coefficient of determination (R2) as represented in Table 6, the value of 0.530 suggested that 53.0% of variances influenced the behavioral intention to use OGD and the value of 0.720 suggested that 72% of variances influenced the trust to OGD website. Hair, Hult, Ringle, Sarstedt, and Kai (2017) considered this value as moderate.

In addition, the f2 values that represent the effect size of a specific exogenous construct on the endogenous construct were also assessed. As asserted by Sullivan and Feinn (2013), both effect size and p-value are essential results to be reported because the p-value can inform the reader whether an effect exists but does not reveal the size of the effect. According to Cohen (1988), the f2 value of 0.35 has a substantial effect on R2, the f2 value of 0.15 has a medium effect on R2, and the f2 value of 0.02 has a small effect size on R2. Referring to Table 6, the results indicated that all the variables have a small effect in producing the R2 for behavioral intention, except for trust towards the OGD website, which has a substantial effect size on R2.

Next, the predictive relevance of the model was examined using the blindfolding procedure. If the Q2 value is larger than 0, the model has predictive relevance for a certain endogenous construct (Hair et al., 2017). In this study, both the Q2 values for behavioral intention (Q2 = 0.461) and trust in the OGD website (Q2 = 0.568) were more than 0, indicating that the model has sufficient predictive relevance.

Discussion: The findings revealed that information quality has a significant relationship with trust in the OGD website. This finding is consistent with previous studies that were conducted by Fitriani et al. (2017), which mentioned that information quality has a significant relationship with trust in the OGD website. According to Fitriani et al. (2017), information quality in open data technologies is associated with the data openness level that is assessed by many indicators, which leads to the reuse, process, and distribution of data freely by anybody. This finding also accords with earlier observations by Nulhusna et al. (2017), which showed that information quality has a significant relationship with trust in the OGD website. Contrary to expectations, this study did not find a significant relationship between system quality and trust in the OGD website. This finding contradicted previous studies by (Lněnička et al., 2022), Teo et al. (2008) and Nulhusna et al. (2017). According to Teo et al. (2008), trust in e-government websites is positively associated with the system quality of the website. According to Nulhusna et al. (2017), system quality has a positive correlation with institutional trust. Good system quality is certainly required to increase trust. Even though both studies were related to e-government websites, this finding is relevant to the context of open data technologies.

5. Managerial Implications and Recommendations

The study on the characteristics that influence the utilization of Open Government Data (OGD) provides vital findings with significant management consequences for both government agencies and organizations interested in OGD projects. One significant managerial aspect is the need to invest in technical infrastructure. The report emphasizes the need for user-friendly and advanced OGD platforms, which require strategic investments to assure data accessibility, interoperability, and ongoing technological adaptation. Robust technological underpinnings are essential for attracting people and ensuring long-term involvement. Furthermore, the report emphasizes the importance of explicit data governance standards. For managers, this means proactively establishing and communicating clear frameworks that address data integrity, security, and privacy concerns. To keep up with technological changes and developing difficulties, managers should evaluate and update these rules regularly. Managers may build confidence in users by prioritizing clear and secure data governance, resulting in a trustworthy environment for OGD adoption.

Conclusion: The goal of the current study is to investigate and comprehend the connection between behavioral intention to use OGD and determinant factors. The determining criteria were modified from two information system theories the trust theory in the information system and the success model of the information system.

This study has looked at three quality factors: system, service, and information quality. Furthermore, trust elements namely, trust in technology and government were taken into consideration as determinant factors to assess the desire to adopt OGD.

The application of the underpinning theories adopted in this study namely as Information Systems Success Model (ISSM) and trust factors led to a new understanding of the factors that influence the intention to use OGD, according to the findings. Information quality from the ISSM was shown to be related to the desire to use OGD and it has been demonstrated that the intention to use the same technology is influenced by both trust in the government and trust in technology.

In conclusion, the use of accessible government data offers societies around the world a transformative opportunity, especially when considered in the context of the ISSM and the trust factor. The ISSM helps us understand how important it is to have data that is easily accessible, relevant, accurate, and timely to maximize its impact and efficacy. Moreover, the trust factor emerges as a crucial determinant in the adoption and utilization of open government data. Trust, both in the source of data and in the institutions governing its release and management, is fundamental. Governments must prioritize transparency, accountability, and data integrity to cultivate trust among stakeholders.

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Gig Economy in Malaysia: Current, Present and Future

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Abstract: This research aims to review the expansion of gig work enabled by digital platforms, providing individuals with flexibility and opportunities to diversify their income. This research emphasizes the difficulties experienced by gig workers, such as social isolation, absence of benefits, financial instability, and the necessity for protective policies. It highlights the significance of acquiring new skills and proposes policy suggestions to establish a conducive atmosphere for gig workers. It contends that the gig economy in Malaysia's future necessitates thorough data and precise regulations to guarantee equitable treatment and advantages for gig workers amid worries about job displacement and the continuation of disparities.

Keywords: *Gig Economy, Sustainability, Social Protection*

1. Introduction and Background

The gig economy refers to a labor market structure where workers are hired on a temporary or on-demand basis, without the guarantee of long-term employment or traditional employee benefits (Petkovski et al., 2022, Linthorst & Waal, 2020). In recent years, the gig economy has had a significant impact on both workers and firms. The flexibility it offers has attracted many individuals, particularly students, the unemployed, and fresh graduates, who are seeking to supplement their income or work independently. Essentially, these gig workers engage in temporary, project-based, and flexible jobs, often facilitated through platforms that connect them with consumers or clients. This trend has redefined the nature of work and workplace expectations for both employees and employers.

Malaysia has seen a notable increase in the gig economy in recent years (Pillai & Paul, 2023). Additionally, a survey by the Malaysian Institute of Economic Research revealed that 45% of Malaysians have engaged in gig work at some point in their lives, indicating the widespread adoption of this employment model. The advancement of technology and digital platforms has led more people to choose gig work as a source of income. This transition to gig work provides individuals with flexibility and the ability to decide when, where, and how they work. Furthermore, gig work allows individuals to diversify their income streams and pursue multiple projects simultaneously, which can lead to increased financial stability. Additionally, the gig economy has also created opportunities for individuals to showcase their skills and talents on a global scale, as digital platforms enable them to connect with clients and customers from around the world.

2. The Present Status of Gig Economy in Malaysia

The gig economy refers to a labor market characterized by the prevalence of temporary positions and the use of independent workers on short-term contracts instead of long-term employment agreements. One notable trend in this market is the rise of digital labor platforms that enable organizations to outsource work to a geographically dispersed pool of workers, such as Upwork and Clickworker. Additionally, there are location-based applications that connect workers with job opportunities in specific geographical areas. In Malaysia, the gig economy is experiencing rapid growth, driven by the emergence of various digital labor platforms. These platforms include ride-sharing services like Grab, food delivery apps like Food Panda and Grab Food, and freelance job portals like Freelancer and Fiverr.

The gig economy not only offers individuals flexibility in choosing when and where they work but also impacts the traditional labor market structure (Chen et al., 2022, Abkhezr & McMahon, 2022, Bonvin et al., 2023). The rise of gig work has redefined workplace expectations for employees, employers, and governments. Moreover, in light of the COVID-19 pandemic, the gig economy is expected to be an enabler of inclusive and sustainable growth post-pandemic(Bonvin et al., 2023)(ŞEN, 2022)(Md Yusof et al., 2022). As a result, policymakers are considering incorporating the gig economy into economic planning initiatives, emphasizing shared prosperity

and inclusive economic growth. With the gig economy being recognized as a source of economic growth, workers need to continue upskilling and reskilling to remain competitive in the industry. A study conducted by Harun et al. surveyed students and alumni of the Universiti Sains Islam Malaysia, and the results showed that a majority of respondents had engaged in gig work at some stage in their lives. This encompasses various jobs like drop shipping, courier services, and food delivery.

3. Social Challenges of the Gig Economy in Malaysia

Gig workers may encounter social isolation and a dearth of assistance within the gig economy (Ahmad, 2020, Bonvin et al., 2023, Liu et al., 2020). The absence of a conventional workplace environment can lead to feelings of detachment and impede social interactions. Furthermore, the absence of support systems and benefits that are typically accessible in traditional workplace settings, such as healthcare coverage, retirement plans, and collective bargaining power, presents significant challenges for gig workers. Consequently, many face heightened economic vulnerability and social insecurity. Additionally, the uneven power dynamics between gig workers and their operating platforms often lead to workers bearing the burdens and costs associated with their work responsibilities - including maintaining their equipment as well as handling expenses related to transportation logistics. For example, a gig worker who provides food delivery services may have to rely on their vehicle for transportation, leading to increased wear and tear and the need for regular maintenance. This can result in additional costs for the worker, cutting into their already limited income. Furthermore, without access to employer-sponsored healthcare coverage, gig workers may find it challenging to afford necessary medical treatments or be left without any coverage at all, further exacerbating their vulnerability and insecurity. On the other hand, some gig workers may opt to use a company-provided vehicle for transportation logistics. In this case, they may not have to worry about wear and tear or maintenance costs. Additionally, gig workers who manage to secure affordable healthcare coverage independently can mitigate the risk of being left without any coverage.

Maintaining a consistent work identity and establishing a stable career can be difficult for gig workers, as they lack a steady workplace and employer relationship which may affect their professional identity (Mehta, 2020). This instability can also hinder their ability to build professional networks and advance in their chosen field. Furthermore, gig workers may also face challenges related to income security. The fluctuating nature of gig work can result in irregular and unpredictable income streams, making it difficult for workers to financially plan and meet their basic needs (Ahmad, 2020). Additionally, the misclassification of gig workers as independent contractors rather than employees can further exacerbate these challenges. Gig workers are often responsible for their own taxes, insurance, and other expenses that are typically covered by employers (Chen et al., 2022, Horan & Bullen-Smith, 2023). This lack of employer-provided benefits adds to the financial insecurity experienced by gig workers, making them more susceptible to economic hardship and limited access to social protections (Horan & Bullen-Smith, 2023). These social challenges faced by gig workers in Malaysia highlight the need for policies and regulations that protect the rights and well-being of this vulnerable group. Without adequate protections and support, gig workers in Malaysia are left to navigate a precarious work environment. The absence of employer-provided benefits not only increases their financial vulnerability but also limits their access to essential social safety nets. To address these issues, policymakers must establish comprehensive policies and regulations that safeguard the rights and well-being of gig workers, ensuring they receive fair compensation, access to benefits, and protection from exploitation.

Gig workers may face a lack of advocacy and representation, making it difficult for them to voice concerns and negotiate for better working conditions. The absence of collective bargaining power can contribute to a perceived imbalance in the gig economy. Gig economy workers share similar issues with temporary agency workers or subcontracted employees when identifying their "employer" for purposes like collective bargaining or health and safety compliance. Furthermore, the gig economy can exacerbate existing inequalities in the workforce. This is particularly evident in terms of income disparities and access to benefits. Gig workers often have less job security and limited access to healthcare, retirement plans, and other employee benefits compared to traditional employees. Additionally, the gig economy tends to disproportionately affect marginalized communities who may already face systemic barriers to employment opportunities. These inequalities can further widen the gap between different socioeconomic groups and perpetuate social and economic disparities.

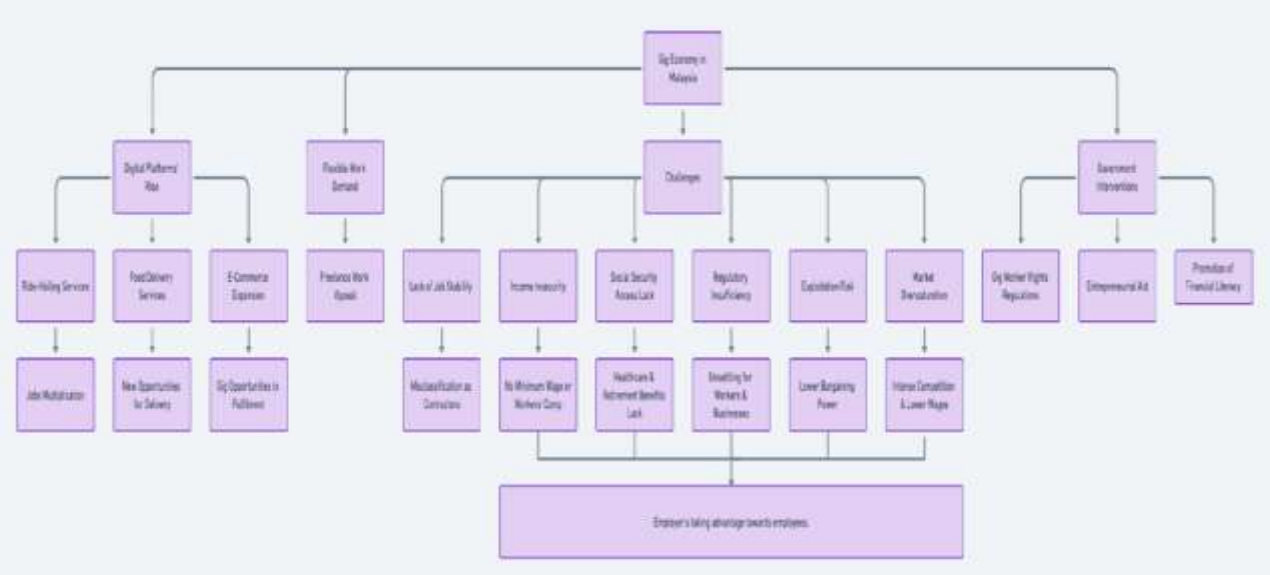
It can further perpetuate gender, racial, and socioeconomic disparities as marginalized individuals may face additional barriers to accessing gig work opportunities and fair treatment within the gig economy. These disparities can result in a concentration of gig workers from marginalized backgrounds in lower-paying and less desirable gigs, further widening the income and opportunity gap. The gig economy has both advantages and disadvantages for workers and firms. The advantages include flexibility in working hours, the ability to choose the type of work, and the potential for higher earnings. However, these advantages must be balanced against the disadvantages, such as the lack of benefits and protections, financial insecurity, and limited career prospects. Additionally, the lack of benefits and protections in the gig economy can leave workers vulnerable to exploitation and unfair treatment. Without access to healthcare, retirement plans, or paid time off, gig workers may struggle to meet their basic needs and face difficulties in planning for their future. Moreover, the limited career prospects within the gig economy can hinder workers from advancing professionally or gaining job stability, further perpetuating economic inequality.

The ambiguity in classifying gig workers as employees or independent contractors can lead to uncertainty regarding their rights and benefits. The clarity in employment status is crucial for workers to understand their legal protections and entitlements, which underscores the significance of using appropriate sources to comprehend the complexities surrounding gig work. The gig economy has sparked significant debate and raised important questions about worker rights, social protection, and labor market inequality. It is essential to address these issues and develop comprehensive policies that ensure the well-being and security of gig workers. Without clear guidelines and regulations, gig workers may be vulnerable to exploitation and unfair treatment by companies. Additionally, the lack of benefits such as healthcare or retirement plans can leave gig workers financially insecure. Therefore, policymakers must prioritize the creation of a supportive framework that safeguards the rights and livelihoods of independent contractors in the gig economy.

Previous research in Malaysia has shed light on the challenges faced by gig workers in the country. These challenges include low pay, crowded marketplaces, employment insecurity, social isolation, overwork, financial precarity, and stressful working conditions. Moreover, gig workers often face difficulties in accessing social protection, such as social security and healthcare benefits, due to their classification as independent contractors (Ran & Zhao, 2023). Therefore, policymakers and stakeholders must engage with these research findings and develop strategies that address the unique needs and vulnerabilities of gig workers in Malaysia, especially in light of the COVID-19 pandemic and its impact on unemployment rates and the growth of the gig economy. The COVID-19 pandemic has further exacerbated the challenges faced by gig workers in Malaysia. With widespread job losses and economic uncertainty, more individuals are turning to gig work as a means of survival. However, this increased competition has led to a further decline in wages and job security for gig workers. Therefore, it is crucial for policymakers to not only address the immediate impact of the pandemic but also implement long-term measures that protect the rights and well-being of gig workers in the country.

This can be achieved through the introduction of regulations that ensure fair wages, job security, and access to social protections for gig workers. Additionally, policymakers should consider promoting entrepreneurship and providing training programs to help gig workers transition into more sustainable forms of self-employment. By addressing these issues, Malaysia can create a more inclusive and resilient gig economy that benefits both workers and the overall economy.

Figure 1: Framework of the gig economy in Malaysia



4. Future of Gig Economy in Malaysia

Nevertheless, within Malaysia's economic sector, there remains a lack of clarity regarding the terminology surrounding Gig workers, and policymakers are still lacking comprehensive data on this matter (Md Yusof et al., 2022). This poses a challenge in accurately evaluating the precise magnitude and influence of the gig economy in Malaysia. Furthermore, apart from the aforementioned difficulties, the gig economy in Malaysia confronts various other present and forthcoming challenges. Firstly, there exists a dearth of social protections and benefits for gig workers. Numerous gig workers in Malaysia do not enjoy the same social protections and benefits as conventional employees, such as minimum wage, paid leave, and healthcare benefits. Insufficient regulation and safeguarding for gig workers: The existing regulatory structure in Malaysia fails to provide a clear definition of the employment status of gig workers, thereby exposing them to potential exploitation and depriving them of crucial benefits and protections.

The growth of the gig economy in Malaysia has raised concerns about its impact on traditional employment. Some argue that the rise of gig work may lead to the displacement of traditional jobs, particularly in sectors like transportation and food service. However, others suggest that the gig economy can complement traditional employment by providing additional income opportunities and flexibility for individuals who may not be able to secure full-time employment. Further research and analysis are needed to fully understand the relationship between the gig economy and traditional employment in Malaysia.

While the gig economy in Malaysia offers flexibility and additional income opportunities for gig workers, critics argue that it also perpetuates precarious employment and a lack of social protections. They argue that gig workers may face exploitation, low wages, and a lack of benefits such as healthcare and retirement savings. Additionally, some policymakers may be concerned about the potential loss of tax revenue from gig workers who may not accurately report their income. These counterarguments and alternative perspectives should be addressed to provide a well-rounded analysis of the gig economy in Malaysia.

One possible solution for addressing the challenges of the gig economy in Malaysia is to establish a Gig Workers Protection Act that provides gig workers with social protections, such as access to healthcare, retirement savings, and paid leave. This act could also define the employment status of gig workers and ensure that they are eligible for benefits and safeguards. Additionally, policymakers can collaborate with platform companies to develop a self-regulatory framework that sets standards for fair treatment, transparency, and accountability within the gig economy. By implementing these recommendations, Malaysia can create a more supportive and equitable environment for gig workers.

A suggested future study on Malaysia's gig economy could be a comprehensive socio-economic analysis aimed at understanding the impact on traditional employment and formulating protective legislation for gig workers. This study would blend quantitative methods, such as surveys and tax data analysis, with qualitative approaches like interviews and focus groups, to evaluate the gig economy's influence on job displacement and government revenue. It would also entail a comparative analysis with other economies that have established worker protections to inform policy recommendations. A collaborative effort to draft a Gig Workers Protection Act would be a key outcome, aiming to incorporate healthcare, retirement, and paid leave for gig workers. The study's significance lies in providing a detailed policy roadmap to ensure gig workers are integrated into the economy equitably, serving as a blueprint for similar economies.

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A Study of the Factors that Influenced Smartphone Purchases among UiTM Students in Malaysia

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Abstract: The global surge in smartphone adoption experienced remarkable expansion, establishing itself as a fundamental component of contemporary living. With ongoing technological progress, smartphones have transformed from simple communication tools into versatile devices with a multitude of features. The decision-making process for smartphone acquisitions was complicated and influenced by a diverse range of factors that differed among individuals, demographics, and cultural settings. This research explored the diverse elements influencing consumers' smartphone purchase decisions, affected by numerous factors ranging from individual preferences and needs to more significant societal trends. Through unraveling these factors, the study aimed to offer valuable insights into the dynamics of the smartphone market, facilitating businesses in adapting to and addressing the evolving demands of consumers. The factors under study were country of origin, product features, brand image, product price, and social influences. Pearson correlation and regression analyses were conducted and the result showed that Product Features and Country of Origin were significant predictors.

Keywords: *Smartphone purchases, UiTM, students, Malaysia.*

1. Introduction and Background

According to a recent report by CounterPoint Research (2023), the worldwide smartphone market experienced a further decline in the opening quarters of 2023, with a 14% decrease in shipments compared to the previous year. This marked the third continuous quarter of decline, which indicated the formidable challenges confronting the industry. Smartphone marketers consistently encountered challenges such as introducing new functions, enhancing product quality, improving appearance, ensuring high-quality services, and utilizing the latest software to remain competitive in the ever-changing and dynamic market. Most individuals use smartphones for internet browsing, social media communication, information retrieval, and video game playing (Tanil & Yong, 2020). Many studies indicated that approximately 35% of the population utilized smartphones. Among these individuals, 94% used their phones to search for local information, 91% conducted product research, and 42% purchased through their devices (Wong, 2022). The determinants affecting customer preference towards smartphones were intricate, as numerous other factors could impact their purchasing decision. In addition, we identified the factors that influenced smartphone purchases among students at the University of Technology Mara (UiTM) campus in Puncak Alam, and the factors that we used as our independent variables were (i) country of origin, (ii) product features, (iii) brand image, (iv) product price, and (v) social influences. The results obtained from our research offered valuable insights into the determinant factors that influenced smartphone purchases. Our study contributed to the existing body of research by investigating comparable independent variables, strengthening the overall validity and support for our findings.

The research objectives for this study are:
RO1: To examine the relationship between country of origin and smartphone purchases.
RO2: To examine the relationship between product features and smartphone purchases.
RO3: To examine the relationship between brand image and smartphone purchases.
RO4: To examine the relationship between product price and smartphone purchases.
RO5: To examine the relationship between social influences and smartphone purchases.
RO6: To examine the relationship between the most significant factors influencing smartphone purchases.

2. Literature Review

Dependent Variable

Purchase intention will determine how likely and ready a customer is to buy a certain brand or product. A consumer's decision-making process and choice among the many options on the market will be affected by this important factor in their buying behavior. Purchase intention will be a very important factor in a consumer's choice to buy a smartphone, according to Alrwashdeha, et. al. (2019). When people have a strong purchase desire, it will mean that they will be set on buying a certain brand of smartphone, even though there will be other options on the market. Electronic word-of-mouth (eWOM) contact will be one of the things that can change someone's decision to buy. Online reviews and tips will be examples of eWOM communication that will give customers useful information and change how they think about a brand. Positive eWOM will be able to make people more likely to buy by lowering doubt and building trust in the choice to buy. In addition, according to Wibowo, et. al. (2021), people will want to buy a certain smartphone when they have a high purchase intention. For instance, if people think that a certain brand of smartphone will have high quality and new features, that will make them more likely to buy that brand. In the same way, a good company image, which will include things like character, trustworthiness, and recognition, will also get people interested and make them more likely to buy. Overall, purchase intention will show how much people will want to buy smartphones. It will be affected by many things, such as the country of origin, the product's features, the brand's image, the price of the product, and social influences. Marketers will be able to use these factors to change people's minds about what to buy and come up with good ways to get and keep customers in the smartphone market (Rakib et. al. 2022).

Independent Variables

Country of Origin: When it comes to smartphones, Wibowo et. al. (2021) will say that the country of origin will affect how people will buy them. The country of origin will be important because it will have a big effect on how people will think about and judge goods. People's ideas about the quality, dependability, and validity of a product will be affected by how that country is known and pictured. Consumers will often connect certain countries with certain traits, like technological progress, economic growth, or skill in a certain field. Furthermore, the country of origin can still affect what people will buy. Researchers will find that a product's good image in its home country will help people think that the product is of high quality. If a smartphone name is linked to a country that is known for making high-quality goods, it will get people interested and make them more likely to buy. Hence, the country of origin can help people decide how good it will be, how well it will be made, and how much it will be worth overall. It will also change how emotionally connected and proud people will be to buy goods from their own country or countries they admire (Anwar, Yasin, Iqbal, Sajid, 2018). Businesses will carefully place their products and will take advantage of the good feelings that will come with certain countries when they know how important the country of origin will be. It will help build a brand's image, bring in the right customers, and change people's minds about buying. It will also help with marketing plans, making new products, and communicating with customers so that everything will fit with how they think about and like products from a certain place. Overall, the country of origin will affect what people will buy by changing how they think about the quality of smartphones. A good image from the country of origin will make people more interested in smartphones and more likely to buy them (Parkvithee & Miranda, 2022).

Product Features: The product features of smartphones will be anticipated to satisfy the evolving needs and desires of customers. Customers will be empowered to select smartphones that offer diverse features, catering to their individual preferences. It will be asserted that customers, each with distinct priorities, will be able to choose smartphones equipped with cutting-edge features aligned with future technologies, enabling them to seamlessly adapt to the latest advancements. Moreover, features will be classified into two main categories: external and internal attributes of smartphones. External considerations will encompass aspects such as body design, size, and weight, while internal factors will involve a comparison of the programs or software, as exemplified by Apple's iOS. These attributes will significantly influence customers, becoming key factors in their decision-making process when making a purchase. According to Ngian, et. al (2023), the age variable will play a statistically significant role in considering product features, particularly those related to technology. Customers are likely to adjust their perspectives based on the technological advancements offered by a brand. The more advanced the technology a brand provides, the greater trust customers will place in that brand. This trend will be notable among both Millennials and Generation Z, who will prioritize superior technology as it

significantly shapes their perceptions (Hallak & Zeid, 2022). As a result, it will be inferred that product features will play a crucial role in positively impacting a brand's image. The enhanced features of smartphones will contribute to elevating the brand image and creating a favorable perception among consumers. The combination of product features and brand image will play a significant role in shaping future purchasing decisions for smartphones. Other studies also stated that factors that influence the purchase intention of mobile phones, features, and design are one of the main factors (Dziwornu, 2023).

Brand Image: The brand image of a smartphone will be critical for its long-term success. It will serve to strengthen, support, and define the brand in comparison to its competitors. Research will continue to show that brand image plays a major role in influencing the intention to purchase a smartphone. Customers will have the flexibility to choose the brand that aligns with their preferences (Mustafa & Al Rifat, 2019). It will be observed that brands with a larger user base and satisfied customers will contribute positively to the brand image, enhancing the likelihood of customers choosing that brand. Users will experience uncertainty, concern, fear, and a sense of threat regarding missing out on information if they do not use the trending smartphone brand. The societal discourse around a particular brand will continue to influence people's comfort levels with their chosen brand. The discussion of smartphone brands in society will impact individuals' feelings of comfort or discomfort. There will be a connection between regular internet usage and the smartphone brand discussed in society, with people feeling uncomfortable if they are not using the brand that is currently popular or being talked about. The research conducted by Song and Kim (2022) suggests that users will not only consider the features and performance of a smartphone but also the brand image, societal trends, and the fear of missing out on information. The findings will highlight the complex interplay of psychological and social factors in consumer decision-making related to smartphones. In addition, the country of origin will have a strong connection with the brand image, wherein a country that produces high-quality smartphones will create a positive brand image for its products. These two independent variables will have a significant impact on the future purchase intention of buying smartphones. It will be evident that the brand image of the smartphone will attract more customers to purchase the smartphone when they can provide strong branding with high quality, and customers will not doubt their decision to purchase the smartphone (Ganlari, Deka & Dutta, 2016).

Product Price: According to Pakola, Pietila, Svento, and Karjaluoto (2023), many customers consider pricing while selecting a mobile phone model. Research by Suki (2023) suggests that young college students' smartphone selection and purchase behavior are greatly influenced by product prices. This implies that while buying a mobile phone, young consumers will take prices into account in addition to technological advancement (Leppaniemi & Karjaluoto, 2015). The cost of a product is a big factor in how people decide if they want to buy it. Some think the price reflects how good the product is, while others might not see it that way. When there are discounts, more people might want to buy, especially if the discounts are big. But, in the case of smartphones, people often care more about how useful the phone is and what features it has, even if the price is a bit higher. Researchers found that the price of smartphones matters when people decide to buy them. Some studies say that the price has a big impact on how much people want a smartphone, while others say it's a main factor in whether people decide to buy one. It's not just about the price itself; it's also about how much people value smartphones and how much they are willing to pay for them (Levrini & Santos, 2021). When it comes to smartphones, the correlation between price and buying decisions is not simple. People prioritize the quality and features of the smartphone over the cost, even if it involves paying a little extra. This aligns with the researchers' proposal that the price of a smartphone significantly influences whether young customers choose to purchase it or not. Consequently, researchers will do a research method to find a deeper understanding of how the price of a smartphone impacts people's desire to buy it, particularly among young customers. In addition, Gaulari et al (2021) claimed that the factors that influence consumer buying design are pricing. Researchers conclude that if the product gives of offers a high price, then it will directly influence and stimulate the buying intentions.

Social Influences: Social influence refers to how people can be influenced by others, either intentionally or unintentionally, impacting their thoughts, feelings, attitudes, and actions. This plays a significant role in what customers decide to do and buy. It's about how other people shape our beliefs, emotions, and behaviors (Mason et al 2021).

Those around us, like family, friends, and peers, can influence what we choose to purchase. Social influence

comes from three connected social forces which are what people around us think, how much we desire something, and how we want others to perceive us. It occurs when people we know, such as parents, family, and friends, interact with each other. For example, when buying something, family can have a considerable influence on our choices. Some individuals may choose to buy an expensive smartphone to showcase their social status. The internet, especially through social media like Facebook and Twitter, has both positive and negative impacts on influencing purchase decisions. People can learn about different brands from online opinions, and social media platforms can sway their choices. Media, parents, and friends can significantly impact the smartphones people want to buy. Young individuals, especially students, often rely on suggestions from others when getting a smartphone. Even during the COVID-19 pandemic, advice from important individuals gained heightened importance in decision-making (Ahsan, 2019). Researchers believe that social influence has a substantial and positive impact on young customers deciding to buy smartphones, and they aim to explore this further through their research method (Rakib et al., 2022).

The Relationship Between Country of Origin and Purchase Intention: According to Wibowo, Rizan, and Febrilia (2021), the relationship between the Country of Origin (COO) and purchase intention is complex and not universally consistent. The COO can influence purchase intention positively or negatively, depending on the product, the country associated with it, and the consumer's perceptions. The literature suggests that some consumers are influenced positively by the COO, particularly when the product originates from a country with a strong reputation for quality production. This positive influence can arise from the "made in" label, which can serve as a stimulus that shapes consumer perceptions and influences their purchasing decisions. For example, products from countries like Japan or Germany might be perceived as high quality, which could lead to higher purchase intentions. However, the direct effect of the COO on purchase intention is a significant relationship. Some studies indicate that while the COO might have a positive effect on perceived quality, it does not necessarily translate into a significant direct effect on purchase intention (Yan et. al., 2019). This suggests that simply having a product from a country with an excellent reputation may not be enough to guarantee higher purchase intentions. Other factors, such as brand image and perceived quality, play crucial roles in influencing purchase intentions. In summary, while the COO can positively influence purchase intention due to its association with perceived quality, its direct effect on purchase intentions has a significant relationship, and the influence can vary across different products and consumer contexts.

The Relationship Between Product Features and Purchase Intention: According to Rakib et. al. (2022), the relationship between product features and purchase intention is a significant factor in the decision-making process of customers when considering the purchase of a smartphone. Product features, such as brand name, product price, social influences, and country of origin, have been found to influence the buying behavior of customers. These features play a crucial role in shaping the preferences and intentions of customers when choosing a smartphone. The study has confirmed that product features have a significant positive influence on customers' purchase intentions for smartphones. This suggests that the attributes and up-to-date features of a smartphone can impact the purchase intention of customers, indicating that customers are more likely to consider purchasing a brand if it offers more attributes and updated features. Therefore, the inclusion of more features and the upgrading of existing features to ensure better online connectivity can increase the purchase intentions of customers. Shahirah et. al (2021) revealed product features were the only factor that significantly influenced the intention of teenagers to purchase mobile phones. Furthermore, the study by Rakibul, Pramanik, Amran, Islam & Sarker (2022) revealed there is a significant effect of product features on purchases-on-purchase intention during the COVID-19 pandemic.

The Relationship Between Brand Image and Purchase Intention: Despite the importance of a smartphone's brand image for its long-term success, the research suggests that, surprisingly, this brand image does not strongly influence people's intentions to buy the product. Customers will be able to select the brand that best fulfills their needs. Brands with a larger user base and satisfied customers will contribute favorably to the brand image, increasing the chance of people choosing that brand. However, the study found a connection between brand image and purchase intention but explained that the impact of brand image is relatively low in driving smartphone purchases. This is because a smartphone's brand image is more than just technical specifications. It's a narrative that extends beyond the device's specifications. Customers tend to associate a brand with certain values, attitudes, and experiences. When a company consistently presents itself as reliable, innovative, and customer-focused, it builds trust and loyalty among consumers. According to Wibowo et. al. (2021), since

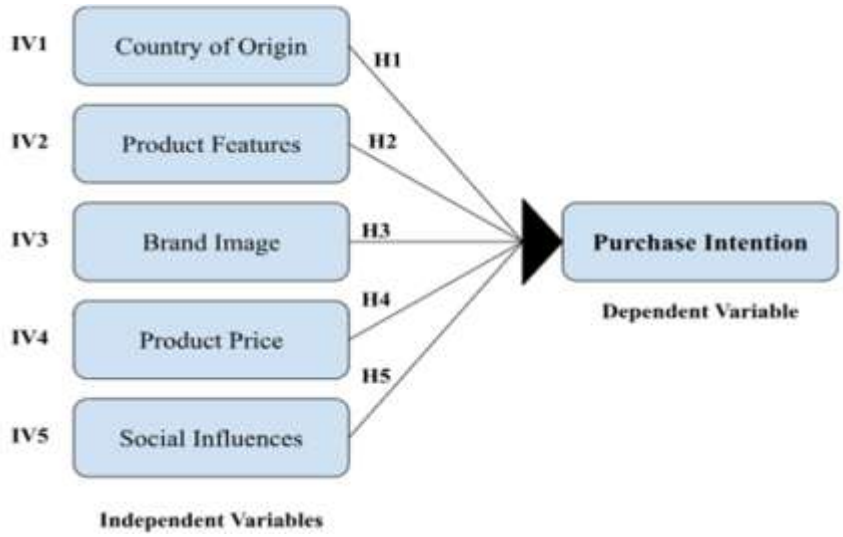
smartphones play a significant role in people's lives, the positive feelings and trust linked to a strong brand image do affect purchase intention. However, the study emphasizes that the impact of brand image, while present, is not as high as other factors like trust and quality when individuals decide to buy a smartphone. Azira et. al (2016), found out brand image has a significant relationship with purchasing intention among university students.

The Relationship Between Product Price and Purchase Intention: The price of a smartphone plays a crucial role in shaping consumers' intentions to buy it. Research consistently indicates that product price is a significant factor influencing purchasing decisions in the smartphone market. The relationship between price and purchase intention is often complex and multifaceted, but this finding shows that there is a positive relationship between product price and purchase intention. This is because price plays a vital role for people when purchasing a smartphone. The price must be aligned with their budget, which means if the price is more than their budget, it can reduce their intention to buy a smartphone. Besides that, lower-priced models may attract budget-conscious buyers or those seeking value for money, influencing their intention to make a purchase. On the other hand, premium-priced smartphones may appeal to consumers who associate higher prices with superior quality, advanced features, and prestige. Moreover, the perceived value of a smartphone about its price is critical. Customers assess whether the features and capabilities offered justify the cost. A favorable balance between price and perceived value positively influences purchase intention. According to Rakib et. al. (2022), customers are more likely to buy a product if the discount rate is more substantial. For example, promotional strategies, discounts, and special offers can sway consumer decisions. Limited-time price reductions or bundled deals often create a sense of urgency, prompting potential buyers to act on their purchase intentions.

The Relationship Between Social Influences and Purchase Intention: Social influence is about how people can be influenced by others, either intentionally or unintentionally, affecting what they think, feel, and believe. Studies show that there's no link between social influence and the intention to buy a smartphone. However, people frequently discover that their choices when buying smartphones are shaped by the people around them. This social influence takes different forms, like suggestions from friends and family, online reviews, or trends promoted by influencers. The desire to fit in with societal expectations or gain approval from others can greatly affect whether someone plans to buy a smartphone. Moreover, the exchange of experiences and viewpoints among social groups builds a shared knowledge pool that guides individuals in picking a device that fits with current preferences or what is seen as socially accepted standards.

Based on the findings of this study, suggest that the influence of smartphone purchases is not universal and affects only a specific group of individuals. The impact of such influence seems limited since people predominantly rely on the opinions of their close relatives rather than being significantly swayed by broader external factors. In other words, the research indicates that some individuals may be susceptible to the influence of external sources. When it comes to buying smartphones, the majority tend to base their decisions more heavily on the recommendations and preferences of their immediate family members. This implies that the impact of external influences on smartphone purchasing behavior might be relatively modest, with personal connections exerting a more substantial effect on individuals' decision-making processes. In addition, Azira et. al (2016), show social influence has a significant relationship with the purchasing intention of smartphones among university students. However, in contrast, the study by Rakibul (2022) et. al. the finding of this study shows social influences have no significant impact on young customers' purchase intentions on smartphones during the COVID-19 pandemic. Therefore, with the literature reviewed, the theoretical framework and hypotheses were developed as follows (Table 1 below).

Figure 1: Theoretical Framework



H1: There is a positive relationship between Country of Origin and Purchase Intention.
H0: There is no relationship between Country of Origin and Purchase Intention.

H2: There is a positive relationship between Product Features and Purchase Intention.
H0: There is no relationship between Product Features and Purchase Intention.

H3: There is a positive relationship between Brand Image and Purchase Intention.
H0: There is no relationship between Brand Image and Purchase Intention.

H4: There is a positive relationship between Product Price and Purchase Intention.
H0: There is no relationship between Product Price and Purchase Intention.

H5: There is a positive relationship between Social Influences and Purchase Intention.
H0: There is no relationship between Social Influences and Purchase Intention.

3. Research Methodology

Introduction: The research design functions as a strategic roadmap, directing the choice of methods and approaches to adeptly analyze data and tackle the research problem. Within this comprehensive framework, we delved into six critical components which are the purpose of the study, type of investigation, extent of researcher interference with the study, study setting, unit of analysis, and time horizon.

Purpose of the study: The purpose of the research is to delve into the factors influencing smartphone purchases among students at UiTM Puncak Alam. The study is to investigate the relationship between Country of Origin (IV1), Product Features (IV2), Brand Image (IV3), Product Price (IV4), and Social Influences (IV5) on Purchase Intention (DV). To achieve this, we adopted a quantitative research approach, employing a correlational investigation design.

Types of Investigation: Besides that, in the construction of this study, a correlational relationship has been explored, examining how one variable moves in conjunction with others that impact smartphone purchases. The data collection method involves surveys, with stratified sampling conducted through online platforms like Google Forms. The collected data was analyzed using the Pearson Correlation Coefficient.

Extent of Researcher's Interference with the Study: Then, the extent of researcher interference in this study has been minimal, as respondents largely remain anonymous, and questionnaires have been distributed through Google Forms. The study setting is characterized as a non-contrived, field experiment, aligning with

correlational studies. This approach ensures that the environment is maintained as naturally as possible.

Study Setting: The investigation unfolded in a genuine setting, devoid of artificial manipulations, adhering to a non-contrived approach where no intentional alterations were made throughout the research. The procedures were characterized by minimal intervention, allowing the factors under scrutiny to remain uncontrolled and unmodified. Data acquisition occurred through a manual administration of an online survey to participants, with the overarching objective of delving into what are the factors that influence smartphone purchases.

Unit of Analysis: The unit of analysis is aligned with the research objective, focusing on identifying the factors influencing smartphone purchases based on respondent preferences. Therefore, individuals were selected as the study unit of analysis.

Time Horizon: A cross-sectional study, a research design employed here, involves simultaneous data collection from numerous individuals. Adequate respondent data is imperative for unraveling the intricate relationships between variables and psychological adjustment. Gathering the necessary information for the theoretical framework might span approximately a month, contingent on the appropriateness of individuals for the research goals. Occasionally, data may be procured periodically to more effectively align with the overarching research objectives.

Population and Sampling: The research population of the study focused on the student community at UiTM Puncak Alam, specifically students from the semester 5 Human Resource (HR) program, PERSENI club, SPORTS community, RESO FBM club, HURES club, and iBEAST club that consisted of 400 members.

Sampling Frame: The sampling frame for this study was obtained in the diverse student community, specifically in Universiti Teknologi MARA (UiTM), Puncak Alam.

Sampling Size: As a sample for our study, we chose students from a diverse student community at UiTM Puncak Alam. This study required a minimum of 196 respondents due to the use of stratified sampling, which is a type of probability sampling. However, the total sample size achieved was 400 as shown in Table 1 below.

Table 1: Sample size

No.	Community	A proportionate Number of Students
1	Part 5 HR Students	155
2	PERSENI club	111
3	SPORTS community	66
4	RESO FBM club	16
5	HURES club	25
6	iBEAST club	27
TOTAL		**400**

Questionnaire Design: The questionnaire designed as shown in Table 2, for this research, was based on two related journals that are also related to the research objective. Following that, we then compiled a list of all questions from those two journals for the lecturer to review before we began collecting data. Furthermore, the questionnaire has included related questions that are based on the factors that influence smartphone purchases. Finally, the Likert scale was used in the selection of elaboration on the variables section.

Table 2: Questionnaire Sources

Variable	No. of Question	Sources
Purchase Intention (DV)	10	(Rakibul, Pramanik, Amran, Islam & Sarker, 2022). Factors affecting young customers' smartphone purchase intention during the Covid-19 pandemic.
Country of Origin (IV1)	7	(Wibowo, Rizan & Febrilia, 2021). The influence of country of origin and brand image on purchase intention of Oppo smartphones with perceived quality as intervening variables.
Product Features (IV2)	5	(Rakibul, Pramanik, Amran, Islam & Sarker, 2022). Factors affecting young customers' smartphone purchase intention during the Covid-19 pandemic.
Brand Image (IV3)	3	(Rakibul, Pramanik, Amran, Islam & Sarker, 2022). Factors affecting young customers' smartphone purchase intention during the Covid-19 pandemic.
Product Price (IV4)	3	(Rakibul, Pramanik, Amran, Islam & Sarker, 2022). Factors affecting young customers' smartphone purchase intention during the Covid-19 pandemic.
Social Influences (IV5)	3	(Rakibul, Pramanik, Amran, Islam & Sarker, 2022). Factors affecting young customers' smartphone purchase intention during the Covid-19 pandemic.

Table 3 shows the response rate of the respondents of the study.

Table 3: Response Rate of The Study

Total E-Questionnaires Distributed	Total Questionnaires Collected	Overall response rate (%)
400	400	100%

4. Data Analysis

The data was analyzed with SPSS version 28 and the demographic analysis was as in Table 4 below.

Table 4: Demographic Analysis

Variable	Frequency	Percentage (%)
Gender:		
Female	301	75.3%
Male	99	24.8%
Age:		
19 – 25 years old	378	94.5%
26 – 30 years old	13	3.3%
31 years old and above	9	2.3%
Marital Status:		
Married	21	5.3%
Single	379	94.8%

Types of Respondents:		
HURES Club	25	6.3%
iBEAST Club	27	6.8%
Part 5 HR Students	155	38.8%
PERSENI Club	111	27.8%
RESO FBM Club	16	4.0%
SPORTS Community	66	16.5%

Table 5: Descriptive Analysis

Variables	Mean	Standard Deviation	Skewness	Kurtosis
Purchase Intention (DV)	4.1627	0.66486	-1.276	3.027
Country of Origin (IV1)	4.0621	0.64700	-.525	0.525
Product Features (IV2)	4.3405	0.61343	-1.154	2.086
Brand Image (IV3)	3.8919	0.82434	-.597	0.335
Product Price (IV4)	3.9358	0.71234	-.749	1.261
Social Influences (IV5)	3.4083	0.99059	-.179	-.497

Table 5 above shows the descriptive analysis. Product Features (IV2) had the highest mean score of 4.3405, while Social Influences (IV5) had the lowest at 3.4083. The descriptive analysis table above reveals that all of the variables achieved a maximum value of 5.00, while Purchase Intention (DV), Brand Image (IV3), Product Price (IV4), and Social Influences (IV5) had the lowest minimum value of 1.00. The analysis unveiled intriguing findings, highlighting a notable score for Purchase Intention (DV) with a mean (M) of 4.1627 and a standard deviation (SD) of 0.66486. Turning our attention to the independent variables, Country of Origin (IV1) demonstrated a respectable mean (M) of 4.0621, accompanied by a standard deviation (SD) of 0.64700. Product Features (IV2) emerged with a robust mean (M) of 4.3405 and a standard deviation (SD) of 0.61343, positioning it as a significant factor. On the other hand, Brand Image (IV3) exhibited a mean (M) of 3.8919, revealing nuances in consumer perceptions, with a standard deviation (SD) of 0.82434. The analysis further uncovered Product Price (IV4) with a mean (M) of 3.9358 and a standard deviation (SD) of 0.71234, indicating its role in shaping consumer decisions. Finally, Social Influences (IV5) garnered attention, showcasing a mean (M) of 3.4083 and a standard deviation (SD) of 0.99059, suggesting its varied impact on Purchase Intention (DV).

Examining the skewness distribution, it is noteworthy that all variables displayed pronounced skewness, with values falling well below the range of 3 to -3 considered indicative of a moderately skewed distribution. Each variable exhibited skewness values surpassing the -3 threshold, underscoring the considerable asymmetry in the data distribution across the board.

Reliability Analysis: The qualities of measuring scales and the items that comprise the scales can be studied using reliability analysis. The Reliability Analysis process computes a variety of regularly used measures of scale reliability as well as information about the relationships between particular scale items. Inter-rater reliability estimates can be computed using intraclass correlation coefficients. In this research, we use Cronbach's Alpha Test. It is because Cronbach's Alpha is a measure of internal consistency, or how closely linked a group of things is. It is regarded as a scale reliability metric. A "high" alpha value does not mean that the metric is unidimensional. Additional analyses can be undertaken if, in addition to testing internal consistency, you want to give proof that the scale in question is unidimensional. Therefore, Cronbach's Alpha supports the creation of reliable evidence for perceived (i) country of origin, (ii) product features, (iii) brand image, and (v) social influences with our Dependent Variable except for (iv) product price that influenced smartphone purchases as shown in Table 6.

Table 6: Reliability Analysis

Variables	No. of Item	No. of Item Deleted	Cronbach's Alpha
DV: Purchase Intention	10	-	0.898
IV 1: Country of Origin	7	-	0.916
IV 2: Product Features	5	-	0.809
IV 3: Brand Image	4	-	0.797
IV 4: Product Price	3	-	**0.515**
IV 5: Social Influences	3	-	0.729

Perusing the table above, all Cronbach's Alpha coefficients exceed the 0.7 benchmark. Significantly, each variable delineated in the table exhibits a commendable reliability quotient surpassing the 0.7 standard, except for IV4, attesting to the online questionnaire items' reliability, comprehensibility, and relevance to the overarching studies. Remarkably, no items within the independent variables have undergone deletion, a strategic decision aimed at upholding the integrity of Cronbach's Alpha values, all of which stand resolutely above the commendable 0.7 threshold for every variable scrutinized. Therefore, IV4 was excluded for further analysis.

Correlation Analysis: We used Pearson correlation analysis to answer the first research question: "What factors influence smartphone purchases?" This analysis helps us understand how two variables are related. The result of the correlation can be either positive or negative, depending on whether the correlation coefficient is positive or negative. The correlation coefficient tells us about the direction, strength, and significance of the relationship between the measured variables. To gauge the strengths of the correlation, we looked at the correlation coefficient's value. If it's less than 0.3, it indicates a weak correlation, between 0.3 and 0.7 is considered a medium correlation, and anything above 0.7 suggests a strong correlation as in Table 8.

Table 7: Correlation Analysis

Variables	DV
DV: Purchase Intention	1
IV 1: Country of Origin	.645**
IV 2: Product Features	.672**
IV 3: Brand Image	.533**
IV 5: Social Influences	.385**

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

Phrasing Correlation

Country of Origin (IV1): We conducted a Pearson correlation to explore the connection between Country of Origin (IV1) and Purchase Intention (DV). The analysis revealed a moderate positive correlation, with r (398) = 0.645, P<0.01, signifying a noteworthy relationship between the two variables. This suggests that as the perception of country of origin increases, there is a concurrent enhancement in Purchase Intention. Product Features (IV2) We conducted a Pearson correlation to explore the connection between Product Features (IV2) and Purchase Intention (DV). The analysis revealed a moderate positive correlation, with r (398) = 0.672, P<0.01, signifying a noteworthy relationship between the two variables. This suggests that as the perception of Product Features increases, there was a concurrent enhancement in Purchase Intention.

Product Features (IV2): We conducted a Pearson correlation to explore the connection between Product Features (IV2) and Purchase Intention (DV). The analysis revealed a moderate positive correlation, with r (398) = 0.672, P<0.01, signifying a noteworthy relationship between the two variables. This suggests that as the perception of Product Features increases, there was a concurrent enhancement in Purchase Intention.

Brand Image (IV3): We conducted a Pearson correlation to explore the connection between Brand Image (IV3) and Purchase Intention (DV). The analysis revealed a moderate positive correlation, with r (398) = 0.533, P<0.01, signifying a noteworthy relationship between the two variables. This suggests that as the perception of Brand Image increases, there is a concurrent enhancement in Purchase Intention.

Social Influences (IV5): We conducted a Pearson correlation to explore the connection between Social Influences (IV5) and Purchase Intention (DV). The analysis revealed a moderate positive correlation, with r (398) = 0.385, P<0.01, signifying a noteworthy relationship between the two variables. This suggests that as the perception of Social Influences increases, there is a concurrent enhancement in Purchase Intention. In our research, we scrutinized four independent variables, namely Country of Origin (IV1), Product Features (IV2), Brand Image (IV3), and Social Influences (IV5). The correlation table presented earlier indicated that there were correlations among all four independent variables.

Regression Analysis

Regression analysis (Table 8) is a statistical method used to analyze or examine the relationship between dependent variables and independent variables. In this study, the dependent variable is purchasing intention, and the independent variables include country of origin, product features, brand image, and social influences. The table below presents the results of the regression analysis for this study. According to the results, the R2 value for this study was 0.571, indicating that the independent variables account for 57.1% of the variance in purchase intention. The remaining 42.9% represents unexplored variables not captured in this study. Therefore, it is recommended for future research to delve into these unexamined factors.

Table 8: Regression Analysis

Independent Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.299	.175		1.710	0.088
IV 1: Country of Origin	.339	.044	.330	7.712	0.000
IV 2: Product Features	.416	.049	.384	8.522	0.000
IV 3: Brand Image	.052	.037	.064	1.404	.1610
IV 5: Social Influences	.050	.027	.074	1.870	.0620
Dependent Variable: DV: Purchase Intention					
R^2	0.571				
F Value	104.774				
Significance	0.000				

Phrasing Regression: A multiple linear regression was calculated to predict purchase attention based on (i) country of origin, (ii) product features, (iii) brand image, and (v) social influences. These are the independent variables that will be examined in this research study. A significant regression equation was found, which was 104.774 (5,394) = 104.774, P < 0.001, with an R square of 0.571. Aside from that, the respondent's predicted variable was equal to DV: Purchase Intention = 0.299 + 0.416 (IV2: Product Features) + 0.339 (IV1: Country of Origin), where IV(s) were coded as 1 (strongly disagree) - 5 (strongly agree). Therefore, the independent variables IV2: Product Features and IV1: Country of Origin were significant predictors.

5. Conclusion and Recommendations

This chapter explores the link between dependent and independent variables, based on the findings from the earlier chapter. This chapter addresses the research limitations identified during the study. In addition, we further discussed and made recommendations for the future use of other researchers. The statistical results from the previous chapter showed that the two independent variables of (i) brand image, and (ii) social influences carried no regression with purchase intention while the country of origin and product features were the factors that positively related to purchase intention.

The Relationship Between Country of Origin and Purchase Intention: Based on the results of this research, there was a significant relationship between country of origin and purchase intention among students in UiTM. The significant value of country of origin is 0.000, which is less than 0.05. Accordingly, H1 is accepted. Previous studies supported this finding, indicating that the country of origin is important since it determines how people perceive and evaluate goods. People's judgments of the quality, dependability, and validity of a product were influenced by how that country was known and portrayed. Consumers often connect certain countries with specific characteristics, such as technical advancement, economic growth, or expertise in a certain field (Wibowo, Rizan & Febrilia, 2021). This demonstrates that the country of origin shapes consumer perceptions of product quality, reliability, and overall value, as well as the way consumers react to and evaluate products.

The Relationship Between Product Features and Purchase Intention: Based on the results of this research, there was a significant relationship between product features and purchase intention among students in UiTM. The significant value of product features is 0.000, which is less than 0.05. Accordingly, H2 was accepted. Previous studies supported this finding, indicating that customers are likely to shift their perspectives based on technology advancements offered by a brand. Customers will place more trust in a brand that supplies modern technology. This trend will be seen among both Millennials and Generation Z, who value greater technology since it influences their perceptions (Kays, 2022). This demonstrated that product features of smartphones are anticipated to satisfy the evolving needs and desires of customers. Customers are empowered to select smartphones that offer diverse features, catering to their individual preferences.

The Relationship Between Brand Image and Purchase Intention: Based on the results of this research, there was a relationship between brand image and purchase intention among students in UiTM. The results in Table 16 reveal that brand image does not influence purchase intention. The significant value of brand image was 0.161, which was more than 0.05. Therefore, there was no significant relationship between brand image and purchase intention among students in UiTM. Thus, H3 was rejected.

The Relationship Between Social Influences and Purchase Intention: Based on the results of this research, there was a relationship between social influences and purchase intention among students in UiTM. The results in Table 16 reveal that social influences do not influence purchase intention. The significant value of social influences was 0.062, which is more than 0.05. Therefore, there was no significant relationship between social influences and purchase intention among students in UiTM. Thus, H5 was rejected.

Recommendations

The integration of smartphones into students' lives has transformed these devices from mere communication tools into essential instruments for learning, organization, and connectivity. As the factors influencing smartphone purchases among students are intricate and pivotal, smartphone manufacturers and educators alike must consider strategies that enhance the educational potential of the smartphone. To begin with, smartphone manufacturers should prioritize the development of education-centric features. Smartphones that offer enhanced access to educational resources, compatibility with learning applications, and features supporting collaborative tasks can significantly appeal to the student consumer base. By tailoring smartphones to meet the academic needs of students, manufacturers not only capture a specific market but also contribute to the educational journey of the users. Furthermore, affordability and accessibility are paramount considerations. Manufacturers and policymakers must collaborate on initiatives that make smartphones more affordable and accessible to students from diverse socioeconomic backgrounds.

Special pricing, discounts, or subsidized programs can play a pivotal role in ensuring that all students have

access to the technological tools necessary for their academic success. Moreover, the seamless integration of smartphones with collaborative platforms and communication tools is another key recommendation. Manufacturers should focus on developing devices that enhance students' ability to collaborate on projects, engage in study sessions, and communicate effectively with peers. A more connected and interactive learning environment can be fostered by ensuring that smartphones are not just individual learning tools but also facilitators of collective educational experiences. In conclusion, the integration of smartphones into the educational landscape requires a holistic approach. By incorporating these recommendations, manufacturers and educators can together shape an educational ecosystem where smartphones serve as powerful instruments, enriching students' academic journeys and preparing them for a digitally connected future. Through strategic collaboration and thoughtful design considerations, the potential of smartphones to positively impact education is not just a possibility but a shared commitment to fostering enhanced learning opportunities for students around the world.

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Enhancing Export Delivery Performance: Strategic Interventions for Overcoming Late Deliveries in Malaysia's Food Trading Company

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Abstract: The present study focuses on a prominent food trading company in Malaysia, which boasts a strong market presence and a commitment to quality in diverse Southeast Asian markets. Despite its strong market presence, the food trading company struggles with significant delays in delivering its export items, adversely impacting customer satisfaction and competitive advantage. The identified delivery performance discrepancies in certain Southeast Asian countries highlight a critical area for investigation. Thus, this study aims to identify the underlying causes of these late deliveries and propose strategic solutions to enhance delivery efficiency. Employing a qualitative case study methodology, the investigation involves semi-structured interviews with ten experienced company employees selected through a purposive sampling technique. The analysis followed a rigorous qualitative data analysis procedure, including data reduction, data display, drawing, and verifying conclusions. The findings reveal four primary causes of late delivery: *1) INACCURATE INFORMATION, 2) INEFFICIENT PRODUCTION PROCESS, 3) TRANSPORTATION SCHEDULING,* and *4) LIMITATION OF THE SYSTEM.* To address the causes, the study recommends *INTEGRATING SYSTEM INFORMATION* to resolve the issues of *INACCURATE INFORMATION and LIMITATION OF THE SYSTEM,* alongside *RESOURCING ALTERNATIVE SHIPPING AGENTS* as a strategic approach to overcome *INEFFICIENT PRODUCTION PROCESS* and *TRANSPORTATION SCHEDULLING*. The findings advocate that the top management of the food trading company to embrace system integration and establish partnerships with reliable transportation agencies to address immediate late delivery concerns. Implementing these strategies will not only address issues of late deliveries but also enhance its export delivery performance, ensure customer satisfaction, and maintain its international market leadership.

Keywords: *Late Delivery, Export Items, Food Trading Company, Ishikawa Diagram, Integrated System*

1. Introduction and Background

Logistics, as the backbone of supply chain operations, consists of the movement, storage, and handling of goods. This process, usually managed by skilled and experienced logisticians, is vital for ensuring timely and accurate delivery. Logistics commonly encompasses two key aspects: upstream and downstream. The upstream, also known as material management (Slam et al., 2023), involves sourcing, acquiring, and maintaining inventory starting from raw materials. On the other hand, downstream logistics focuses on physical distribution, including the transportation and processing of company orders (Obiero, 2019; Saleheen & Habib, 2023). The downstream logistics are crucial as they directly affect the delivery of goods to customers, highlighting transportation as a tactical strategy in bridging the suppliers to customers. However, the challenge lies in ensuring the delivery of goods is timely, accurate, and meets quality standards, a task often beset with competitive and operational hurdles (Pott et al., 2023). Therefore, addressing these challenges is crucial for companies that aim to maintain efficiency and customer satisfaction in the increasingly competitive food trading industry.

The selected food trading company in this research has been in Malaysia's market for nearly 25 years. The company aims to provide high-quality products and services that enhance people's lives, including health foods, supplements, household items, and skincare products. The food trading company, with nearly 180 employees possessing diverse talents, operates by the Direct Selling Association of Malaysia's (DSAM) guidelines. Its distribution center appropriately complies with Good Distribution Practice for Medical Devices (GDPMD) practices. The products and services of the food trading company are distributed locally and internationally. Specifically, they are exported to countries in Southeast Asia.

To safeguard its competitive advantage and market position, the food trading company must adopt several strategies to retain its customers' loyalty from shifting to other brands (Rathore et al., 2023). One of the key strategies is on-time delivery, which requires optimization of inter-department process flows, effective implementation of robust shipment preparation, and thorough delivery planning (Pott et al., 2023). Nevertheless, the data on the export items delivery performance of the food trading company across nine Southeast Asian countries revealed discrepancies, specifically in Cambodia and the Philippines, where late deliveries were notably evident. It is reported that the delivery performance of Cambodia and the Philippines is 91.00% and 87.00%, respectively. Thus, the regional overall delivery performance for 2022 is 97.56% out of 100%, falling short of the management team's Key Performance Index (KPI) of 100% on-time delivery for each country. This shortfall led to significant dissatisfaction with the food trading company's management team, prompting a thorough investigation into the underlying causes of these delivery delays.

These delivery delays caused the food trading company to pay additional transportation and operation costs to resolve the implication. The company may have to pay penalties for breaching contractual delivery deadlines and additional shipping and storage fees, resulting in losses or decreased profit due to unavailable stock. These consequences are also mentioned by Fan et al. (2023), who emphasized the significant impact of late delivery on firms. They noted that disruptions caused by delays not only incur substantial costs for the firm but also negatively affect its investors. Furthermore, the delayed delivery of export products can result in pressure and conflicts between the food trading company and its customers. This adversely impacts customer satisfaction and potentially drives them to seek products from competitors (Dündar & Öztürk, 2020). By realizing the above scenario, this study thus aims to 1) identify the causes of the late delivery of export items within the food trading company. Subsequently, 2) it proposes some practical recommendations for resolving the issue of delayed delivery of export items in the company.

2. Literature Review

Logistics Management for Export Items: Critical elements are crucial in logistics service networks, particularly those focused on managing export items and aiming for resilient operations, as Chen et al. (2022) indicated. These networks involve the efficient and effective movement of export goods along the supply chain, encompassing participants ranging from suppliers to end customers. Effective logistic management in the context of export items is crucial as it could assist in reducing operational costs, enhancing inventory control, and boosting production rates. This efficiency is significant for the timely and cost-effective transportation of export items, which are often subject to strict deadlines and quality standards. Moreover, increasing overall efficiencies significantly improves customer experiences and satisfaction levels for suppliers and international customers. Furthermore, in the competitive realm of global trade, robust logistics management of export items provides a tangible competitive advantage, ensuring the company's ability to meet diverse market demands and maintain its standing in the international marketplace.

A few researchers, such as Abdallah et al. (2021) and Jonsson et al. (2024), conducted studies by exploring various perspectives regarding the company's delivery activities of export items. For instance, a study by Abdallah et al. (2021) underscores the critical role of supply chain integration as a key component in enhancing the delivery performance of export items. Nevertheless, it is important to note that any delay in the delivery of export items may have a ripple effect, impacting various stakeholders within the supply chain network (Li, 2019).

Late Delivery: Delivery processes consist of several critical activities, including the preparation of a goods travel document, the physical transportation of exported items, and ensuring accurate quantities are transferred from the shipper to the carrier and, ultimately, to the customers. The commitment to on-time delivery leads to the development of a reliable and robust relationship between the company and its customers, as is seen as a marker of operational excellence (Niemi et al., 2020). Moreover, following scheduled delivery times is essential to comply with international trade regulations. In cases where export items are delivered late, companies may need to identify alternative solutions, such as arranging for additional shipments with expedited delivery to fulfill the customer's demand.

Late delivery could be described as the duration beyond the agreed-upon delivery time that the shipper takes

to deliver goods. In the context of export items, such delays might increase transportation and operational costs, which will affect the company's profitability, diminishing customer satisfaction and potentially encouraging customers to switch to competitors who consistently deliver on time, as mentioned by Kusrini et al. (2020). In addition, the authors discovered that late delivery is caused by various factors. These include late booking, constraints in supplier production capacity, transportation inefficiencies, delays in material delivery, production process bottlenecks, and trucking issues, among other significant elements. Delays in delivering items to consumers can result in two significant consequences. Firstly, it can result in financial penalties or fines for failing to meet delivery schedules or deadlines (Bhattacharyya et al., 2023). Secondly, in the context of perishable goods, such delays may cause sanitation issues, compromising the quality and safety of the products (Bandoophanit & Pumprasert, 2022).

Factors of Late Delivery for Export Items: In their comprehensive review, Jonsson et al. (2024) underscored that previous studies have extensively explored various factors that may contribute to inconsistent delivery schedules for export items. These factors are categorized into two groups, which are external and internal factors. External factors include demand and supply, such as market fluctuations and supplier reliability. On the other hand, internal factors consist of product-specific characteristics and manufacturing-related variables such as production capacity and process efficiency. Jonsson et al. (2024) also highlighted that a critical aspect that has usually been overlooked in supplier relationships is the preparedness of supply chains to handle disruptions and the complexity of transportation dynamics. These elements are paramount in understanding the roots of delivery schedule instability and late delivery of export items.

Other key factors that may lead to the late delivery of export items include the mode of transportation, transit time, adherence to customs, and regulatory compliance. Additionally, the accuracy and timeliness of shipping documents are crucial to sustain customer satisfaction and maintain the company's competitiveness in the market. Despite the importance of on-time delivery in international trade, there remains limited research to identify and address the factors that influence the late delivery of export items. For instance, a study by Akalanka (2020) highlighted the impact of transportation in determining the timeliness of exports. The study also explains that the choice of transportation mode directly affects various aspects such as transit time, costs, and the distance over which goods must be delivered. Sea shipping, for example, offers a cost-effective solution. It typically involves longer transit times compared to air freight. Alternatively, air freight, though significantly faster, incurs higher costs than sea shipping. These transportation dynamics play a crucial role in the timely delivery of export items and consequently improve the efficiency of the global supply chain.

Customs and regulatory compliance are other factors that can influence the late delivery of export items. Proper labeling, packaging, acquisition, and authorization of relevant documents, such as import and export permits, are essential for compliance before and after export items enter the destination country. The meticulous preparation ensures a more efficient processing of goods through customs at their destination. Moreover, the timely provision of shipping documents is vital for the seamless delivery of export items. The document encompasses commercial invoices, packing lists, Bills of Lading (BL), and relevant tax exemption documents, which must be ready, available, and accurately prepared to meet the demands of customs clearance procedures.

Marpaung (2021) highlights the significance of efficiently managing export documentation as a critical factor in the delivery process. This includes not only the prompt handling of these documents but also ensuring their accuracy to facilitate efficient customs clearance. Accurate documentation is essential to avoid costly amendment and penalty charges that emerge from errors or discrepancies. The efficiency and precision in handling these regulatory and documentation aspects are fundamental in preventing delays and ensuring the prompt delivery of export items.

Recommendation for Late Delivery of Export Items: Previous researchers have proposed several suggestions and viewpoints to enhance delivery performance, specifically transitioning from late to on-time delivery. A key area of focus is improving order processing time. This involves streamlining the process by eliminating redundant or unnecessary steps and simplifying the order processing sequence. By doing so, the efficiency of the overall delivery process can be significantly increased.

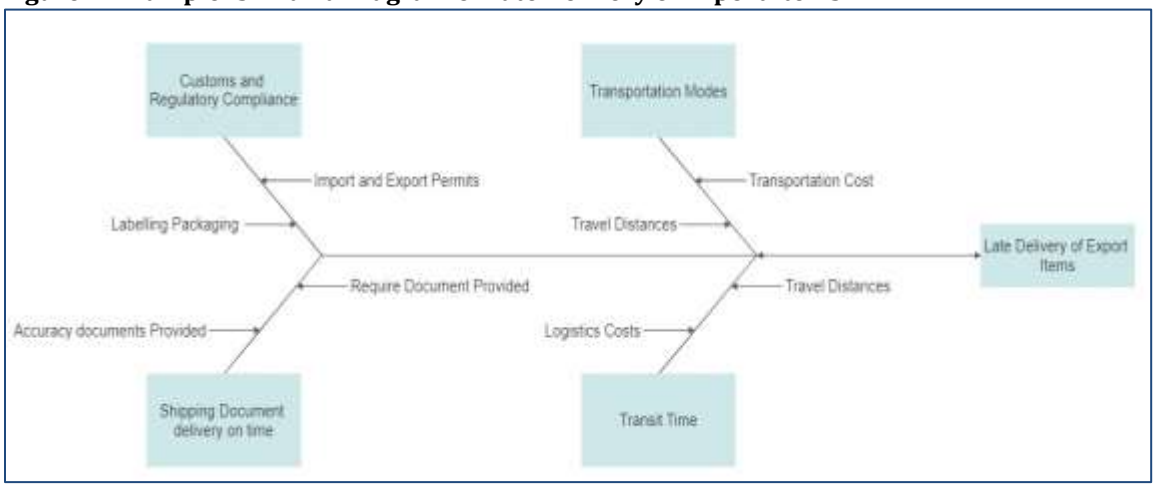
Cichosz et al. (2020) recommended leveraging digital transformation to minimize reliance on manual labor in

transportation, logistics, and warehousing. This approach enhances visibility across multiple tiers of the supply chain, facilitating more efficient and effective operations. For example, trackable delivery progress could be improved by developing an online tracking portal. The online tracking portal can consolidate data on shipment progress so that customers can monitor the delivery progress. Customers can be provided with tracking options to monitor the progress of their delivery shipments. Trackable delivery progress allows the food trading company to proactively handle late delivery of export items to enhance customer satisfaction and confidence in the business deal.

Another aspect of addressing late delivery of export items involves retaining or preserving recipients' delivery addresses. The validation and accuracy of recipient delivery addresses could lead to efficient delivery performance by transporters. It avoids incorrect delivery and guarantees that the items are delivered to the correct location. In addition, registering both items and documents with the recipient's delivery address ensures compliance with the regulatory requirements of the destination country. This practice eliminates delays and additional processes often arising from inaccuracies in the delivery addresses of export items destined for local markets.

Ishikawa Diagram: The Ishikawa diagram is also known as the fishbone diagram, as its shape is like a fishbone. The Ishikawa or fishbone diagram aims to identify possible causes of the issue to improve the event, which categorizes different causes into the branches in the simulated fishbone. Das et al. (2020) explained the steps of using the fishbone diagram, beginning with identifying the problem, preparing the significant factors involved, identifying the possible causes of the event, and analyzing the diagram. The Ishikawa fishbone technique is applied in this study to evaluate the cause-and-effect that led to the late delivery of export items in a food trading company.

Figure 1: Example Ishikawa Diagram of Late Delivery of Export Items



3. Research Methodology

This study employed qualitative methods, leveraging the case study methodology to delve deeply into the factors influencing the late delivery of export items at the food trading company. The qualitative approach is chosen due to its strength in obtaining in-depth exploration and understanding of the factors (Creswell & Creswell, 2018). In addition, the case study method illuminates the details of the circumstance and provides a comprehensive framework for analyzing and interpreting the data within the food trading company.

The population of the study comprises 180 individuals working across various departments within the food trading company. For the present study, the purposive sampling technique was utilized to select participants who possess specific expertise and experience related to the delivery process to gain knowledge about the studied phenomena (Sekaran & Bougie, 2019). This sampling technique was deployed to ensure that the data collection process achieved the research's aims. The participants who are directly involved in the food trading

company's delivery process in the company were targeted to gather relevant data that pertains to the research topic. The participants have approximately 7 to 30 years of working experience, and their job designation ranges from coordinator to manager.

The participants for the interview session are required to provide detailed feedback related to their job scope, explicitly focusing on routine delivery activities, as observed and identified by the researcher for the study. On that note, a semi-structured interview session was used to collect the data from the participants. The interview sessions with the participants were conducted face-to-face for 45 minutes to one hour. The interview session was recorded with the participants' agreement, and if the participants refused to be recorded, then effective note-talking was utilized. During the interview sessions, open-ended questions related to the late delivery of export items were asked to gather various perspectives from the selected participants.

Feedback from the participants was then carefully transcribed. The transcription was then analyzed by using the three main steps of qualitative data analysis as suggested by Hashimov (2015), which are, 1) Data reduction, 2) data display, 3) data drawing, and verifying conclusions. Data reduction involves organizing qualitative data obtained through interviews and observations. The data displayed in this study was demonstrated using the Ishikawa diagram to illustrate potential factors and sub-factors affected by the late delivery of export items for problem-solving. Drawing and verifying conclusions are the final analytical activity in this study, where all factors and sub-factors highlighted by the participants during the interview session are illustrated in the fishbone or Ishikawa Diagram.

Profile of Respondents: Initially, 11 individuals were contacted for participation. However, only ten agreed to participate in the interview session, aligning with Opara et al. (2021), who suggest this is an appropriate sample size for qualitative research. The participants' demographic information, including job designation, gender, age, and working experience, is exhibited in Table 1.

Table 1: Respondents' Demographic Information

Participant	Job Designation	Gender	Age (years)	Years of Working
R1	Senior Executive Warehouse	Female	40-49	20
R2	Distribution Manager	Male	50 ≥	30
R3	Logistics Supervisor	Male	30-39	10
R4	Logistics Coordinator	Female	30-30	8
R5	Warehouse Manager	Male	50 ≥	20
R6	Operation Manager	Female	40-49	7
R7	Logistics Manager	Female	50 ≥	7
R8	Quality Management Manager	Male	40-49	10
R9	Procurement Assistant Manager	Female	40-49	4
R10	Senior Executive Logistics	Male	30-39	13

4. Findings

This section will explain the findings of the study according to its aim, which is firstly to identify the causes of the late delivery of export items within the food trading company. Secondly, some practical recommendations for resolving the issue of delayed delivery of export items in the company are proposed.

Findings for Research Aim 1: This section discusses the findings of the first research aim by highlighting the causes of food trading companies' late delivery of export items. The collected data confirms that the food trading company has experienced late delivery for their export items, which was agreed by 80% (n=8) of the participants. In contrast, 20.0% (n=2) of the participants deny the occurrence of late delivery in the company. The finding aligned with the statement of the company's distribution manager, who asserted that the company faced late delivery for the export items during the interview session. He said, "Yes, our company faced late delivery." During the interview sessions, it was also discovered that the food trading company utilizes Key Performance Indicators (KPIs) to evaluate on-time delivery activities for their export items. All participants (n=10) unanimously acknowledged that the food trading company used KPIs to measure and evaluate the

performance of on-time delivery activities for its export items.

The findings from the interview sessions have identified the causes of the late delivery of the export items, as presented in Table 2 below. Four factors were identified which are 1) *INACCURATE INFORMATION*, 2) *INEFFICIENT PRODUCTION PROCESS*, 3) *TRANSPORTATION SCHEDULING*, and 4) *LIMITATION OF THE SYSTEM*. A detailed explanation of the factors and sub-factors is further elaborated in Table 2.

Table 2: Causes and Sub-causes of The Late Delivery of the Export Items

Causes	***Sub-Causes***	***Sub causes Definition***
1) Inaccurate Information	*Inaccurate delivery due to recipient Information*	*The address is provided incorrectly, causing incorrect delivery*
	Incorrect package order	*Lead delivery attempt due to incorrect package order*
	The incorrect shipping addresses on the consignment	*Shipping information, such as contact and lot numbers, was not updated*
	Incorrect delivery information provided	*Buyers might give inaccurate contact details.*
	The exporter and importer did not communicate important information	*Late deliveries were due to a non-conformance, but the non-conformance was not being communicated properly*
	International shipment without proper documentation	*The necessary documents could be presented inaccurately or missing upon arrival at customs at the destination.*
2) Inefficient Production Process	*Late picking and packing*	*Item out of stock, delays in picking and packing*
	Raw materials supply	*Delay supply of materials for process continuation*
	Sequencing activities	*Activities vary by country.*
	Insufficient manpower	*Flexible working hours may cause late delivery during festival sessions.*
3) Transportation Scheduling		
	Realistic vessel schedule	*Late vessel schedule affects production progress.*
	No schedule	*A shipping schedule is needed, but the vessel was unavailable on the scheduled date.*
	Delayed shipping for finished products	*Shipping delay impacts party processes.*
4) Limitation of the System	*The system is down*	*Goods received to insert into the system were down, which affected the progressive sequence activities and caused the stock from the supplier not to be on time to receive stock.*
	System multifunctional impacting communication breakdown	*System issues due to communication breakdown between exporter and importer along the supply chain*
	Lack of sufficient system for transaction activity	*ERP may not be compatible with other export markets and their systems, resulting in late delivery. The non-conformant was detected and informed to the other department, involving another department's authority and approval.*

Causes 1: *INACCURATE INFORMATION* emerged from the interview sessions as one of the factors that caused the late delivery of export items in the food trading company. Six participants, ranging from the supervisor, senior executive, and manager, voiced similar opinions related to *INACCURATE INFORMATION*. During the interview, the operations manager, with seven years of working experience in delivery activities, explained *INACCURATE INFORMATION* more clearly than the other participants.

She said the *INACCURATE INFORMATION* caused by the wrong address or uncontactable recipients may have contributed to late delivery. She pointed out how incorrect information can result in the late delivery of export items. As a result, her operation team might require assistance from the office staff to contact the customer and confirm the delivery details when the delivery person gets close to the customer's location. She shared, *"There are some issues with some of our customers or purchasers. Sometimes they provide us with wrong information or address."* She also added, "Sometimes the product is sent to the address stated, but the address is wrong."

A warehouse manager provided another perspective about *INACCURATE INFORMATION*. He explained, "*The shipping consignment notes do not state the address correctly*. *Sometimes, the operation team member missed out on some information, such as the contact number and lot number, and as a result, we faced difficulties in identifying the location."*

Another situation that leads to late delivery of import items is also shared by the warehouse manager. He explained, "When we have an issue of inaccurate information, the delivery man will return the item to the warehouse. At the warehouse, the operations team consults with customer service to verify the correct customer details before reshipping. The customer service department then reviewed the information and emailed us the corrected delivery address. Resolving this issue will take one to two days, resulting in delayed delivery to the customer."

Cause 2: *The second factor causing the late delivery of export items at the food trading company was the INEFFICIENT PRODUCTION PROCESS, which was identified in the interview sessions. Four participants in managerial positions emphasized the INEFFICIENT PRODUCTION PROCESS* from various perspectives.

The warehouse manager, who has almost 20 years of working experience related to delivery activities, voiced a statement that insufficient manpower was observed as a sub-cause with regard to *INEFFICIENT PRODUCTION PROCESS*. He said, "*Implementing flexible working time has resulted in a manpower shortage. This issue has always occurred at our operational site, especially during the festive season, leading to potential operational disruptions".* Thus, as a backup, the production department must bring in extra staff from other departments to ensure the delivery process runs smoothly, particularly during festive seasons.

Moreover, the distribution manager noted that any delays in the picking and packing process are considered inefficient in the production process. He worries that late picking and stock packing would impact the delivery of export items within the food trading company. He emphasized the importance of immediate picking and packing for order fulfillment, depending on the availability of stocks. The distribution manager highlighted, "*In the warehouse, delays in picking and packing often occur when items are out of stock or unavailable. Having stock readily available streamlines the warehouse's picking and packing process, enabling efficient processing of incoming orders. This ensures timely delivery".*

Cause 3: *TRANSPORT SCHEDULING* is another cause of late delivery identified from the interview sessions. Some relevant feedback was voiced by the logistic and operation managers who experienced delayed shipping schedules. The logistics manager pointed out that the transporter's vehicle failed to follow the schedule timeline. As such, any changes made during the delivery were outside the food trading company's control. The logistics manager said, "*The transporter picked up export items and later notified us of a delayed shipping schedule.*" She also added, "*The delayed shipping inevitably results in late receipt of items by the recipient. As such, the company must maintain close communication with the transporter to monitor the shipping schedule accurately".*

Another opinion offered by the operation manager is that the availability of vessel schedules may cause delays in the delivery of export items. Considering this perspective is crucial to ensure that orders are fulfilled on time. She asserted*, "Sometimes the issue arises from our forwarding agent or service provider, who encounters problems with vessel scheduling. Alternatively, they lack a schedule that would enable us to ship or deliver our product to our customers."*

Cause 4: During the interview session, it was also discovered that *SYSTEM LIMITATION* emerged as another

factor that caused the late delivery of export items within the food trading company, particularly on the compatibility issue. Moreover, three sub-factors were identified from *SYSTEM LIMITATION: the system is down, the system issues experienced in the warehouse, and the lack of a sufficient system* for transaction activity. Some participants, who are senior executives and managers of the food trading company, pointed out that the system frequently contributes to delays due to its significant limitations. As a result, the participants anticipated urgent improvement in the system as feedback.

The senior warehouse executive with 20 years of experience in delivery operations emphasized that any system downtime would result in delayed deliveries. She said, *"Sometimes the system is down, sometimes the load is too heavy for the system. So, it causes a delay to the delivery."* The distribution manager, with 30 years of experience in delivery activities, said, *"At the warehouse, the system issues have caused a communication breakdown between exporter and importer along the supply chain."*

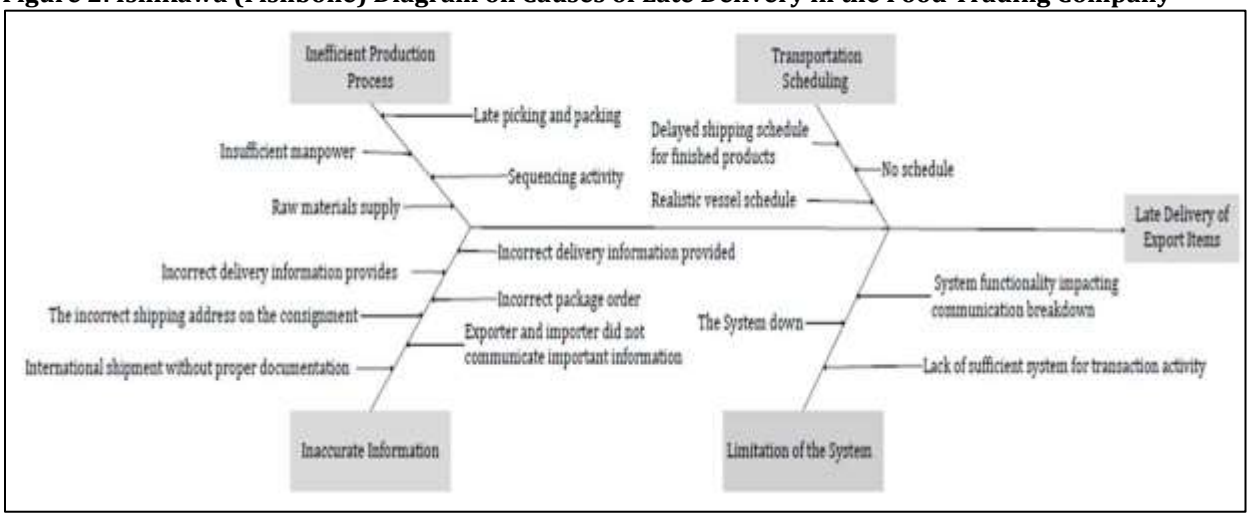
Similarly, the quality management manager with ten years of experience in delivery activities explained, *"The system may not be compatible with the other export market we intend to access. Thus, we may need to adopt other approaches, whether manual or a different system. This lack of compatibility, along with the end users' or another country's software unfamiliarity, can lead to delays in deliveries".*

Causes Illustrated in an Ishikawa or Fish Bone Diagram

The findings discovered in the interview sessions are then presented in the Ishikawa or Fish Bone Diagram. This graphic tool organizes and categorizes the causes into different branches, making understanding the issue and solution easy. In the Ishikawa diagram presented in Figure 2, four factors that caused the late delivery of export items within the food trading company are presented and placed at the four main branches. The causes are *INACCURATE INFORMATION, INEFFICIENT PRODUCTION PROCESS, TRANSPORTATION SCHEDULING, and SYSTEM LIMITATIO*N.

Figure 2 also shows that each identified cause or branch is elaborated upon through its respective sub-causes or sub-branches, such as *LIMITATION OF THE SYSTEM*. The cause encompassed sub-causes, including the system being *down*, *issues encountered by the system*, and *lack of a sufficient method for transaction activity*. These sub-causes highlight participants' different perspectives on the *LIMITATION OF THE SYSTEM*. The sub-causes have been clearly explained in section 4.1 and presented in Table 2.

Figure 2: Ishikawa (Fishbone) Diagram on Causes of Late Delivery in the Food Trading Company



Finding for Research Aim 2

This section will discuss the findings related to the second research aim of the study. It focuses on identifying solutions to address the causes of the food trading company's late delivery of export items. The solutions proposed by the participants to address the identified causes are 1) *INTEGRATING SYSTEM INFORMATION* and 2) *RESOURCING ALTERNATIVE SHIPPING AGENTS*.

Solution 1: The recommendations provided by the participants primarily focused on *INTEGRATING SYSTEM INFORMATION*, which is the primary solution to address two identified causes, including *INACCURATE INFORMATION* and the *LIMITATION OF THE SYSTEM*. This recommendation is essential for achieving timely and precise deliveries, therefore enhancing delivery performance through improved system capabilities. By refining delivery process activities and incorporating critical information, the system's effectiveness can be significantly improved. Moreover, *INTEGRATING SYSTEM INFORMATION* will allow related stakeholders, including customers, operations team, exporters, and importers, to monitor and track delivery activities. Thus, each stakeholder can accurately access vital information, leading to enhanced delivery efficiency.

Improving the system's capability will also reduce the occurrence of *INACCURATE INFORMATION*, benefiting the managers' experiences. One of the participants expressed concern about the necessity of verifying and correcting received data or information before initiating the delivery process. He emphasized, *"We make it a priority to confirm that the orders we receive from customers contain the correct information before we proceed with the delivery."*

Substantial evidence also supports the recommendations of managers and senior executives regarding solutions to address the cause of the *LIMITATION OF THE SYSTEM*. The distribution manager proposed employing reliable logistics software to schedule orders and shipments: *"Adopting information software, such as automatic planning software, can accelerate the preparation of deliveries. Such software simplifies the planning process, especially contributing to more on-time delivery."*

INTEGRATING SYSTEM INFORMATION can also address the issue of customers needing to use different systems in various geographical locations. The quality management manager shared his experience with *INTEGRATING SYSTEM INFORMATION. "With regard to the system, I have experienced good results from companies that develop a single software to accommodate all exporters. So, whenever an exporter A sends a file, the system automatically processes all the contained information. Thus, both the sender and the receiver can access and interpret the information timely and accurately*."

Solution 2: Another recommendation provided by the participants focused on *RESOURCING ALTERNATIVE SHIPPING AGENTS* as the solution to address *INEFFICIENT PRODUCTION PROCESS* and *TRANSPORTATION SCHEDULING*.

The managers and senior executives recommended several suggestions to address the *INEFFICIENT PRODUCTION* PROCESS. As per the findings, the warehouse manager has a practical solution to optimize manpower and increase delivery efficiency, i.e., the warehouse department must update the customer service department on late delivery occurrences. According to the manager, *"Late delivery often occurs due to a manpower shortage. We tried to schedule our staff efficiently to ensure timely stock dispatch. However, sometimes the scheduled staff are not available when needed. In that case, we need to communicate these delays promptly to the customer service department that coordinates our delivery operations".*

In terms of *TRANSPORTATION SCHEDULING*, the managers recommended several suggestions to address the issue. The logistics manager emphasized meticulous scheduling and planning of delivery activities to boost efficiency and guarantee transportation availability. He stated, "*Efficient delivery depends on well-organized scheduling and planning*. *Thorough preparation will enhance the overall efficiency of the delivery process*". Furthermore, the operations manager mentioned that providing customers with up-to-date information will enable them to track transportation progress. He said, "*We consistently update our records and communicate with our customers. We also create contingency plans to address potential issues proactively*.

Discussion

Research Aim 1:

This study aimed to discover the root causes of the late delivery of export items in the food trading company. *INACCURATE INFORMATION, INEFFICIENT PRODUCTION PROCESS, TRANSPORTATION SCHEDULING*, and the *LIMITATION OF THE SYSTEM* were identified as the causes that contributed to the late delivery of export items in the company. These factors required improvement to align with the trading company's KPIs for delivery performance and to ensure the satisfaction of the end customer.

The interview sessions with the participants revealed that *INACCURATE INFORMATION* significantly affects on-time delivery. This finding is consistent with the findings of other scholars, such as Kusrini et al. (2020) and Marpaung (2021), who identified precision and accuracy as areas requiring mitigation to improve the on-time delivery of export items. Most participants in the study also agreed that *INACCURATE INFORMATION* significantly causes late delivery in the company. The finding aligns with Ju et al. (2019) and Abdulla and Musa (2022), who stated that logistics service providers should manage the information flow effectively to regulate the movement of goods within their company. Therefore, accurate information is essential in ensuring punctuality in delivery, particularly for import and export items.

The INEFFICIENT PRODUCTION PROCESS is another factor contributing to the late delivery of export items, identified during interview sessions. The *INEFFICIENT PRODUCTION PROCESS* needs improvement to ensure effective delivery by closely monitoring the production process, particularly the labeling and packing activities. This is because the labels and packaging of the items must comply with various countries' product registration requirements. Failure to comply with the destination country's regulations may delay delivery by three to four working days. Thus, activities in the production process must be executed promptly to prevent the backlog of incoming orders from impacting subsequent picking and packing processes. This is important as *the INEFFICIENT PRODUCTION PROCESS* would lead to additional company resources such *as* processing time, labor hours, capital, and raw materials to fulfill the delivery activities.

TRANSPORTATION SCHEDULING is another essential factor contributing to the late delivery of export and import items to the food trading company. This factor was also emphasized by Obiero (2019) and Huiwen et al. (2023), who highlighted the critical need for an effective transportation schedule for efficient physical distribution to fulfill the trading company's customer demands. The study reaffirmed that the availability of *TRANSPORTATION SCHEDULING* is required for on-time delivery. However, during the interview session, participants of the present study disclosed that the food trading company outsources its transportation activities to an external transportation firm. Thus, this external company is responsible for managing the transportation scheduling for the food trading company. This process is beyond the control of both the food trading company and its customers.

The last factor frequently mentioned by participants that contributes to the late delivery of the export and import items in the food trading company is the *LIMITATION OF THE SYSTEM*. Some participants complained that the existing system could only handle a small volume of orders, which becomes problematic during peak periods. The *LIMITATION OF THE SYSTEM* can result in communication breakdown among related parties involved in the delivery process, potentially leading to significant disruption. Due to this constraint, there is often a need to record the order transaction using manual methods, forms, or other alternative systems. The present finding aligns with the studies by Kusrini et al. (2020) and Obiero (2019). Both studies suggest that optimal integration of information technology is crucial for enhancing information sharing, which is crucial in addressing the issue of late delivery of export items within the food trading company. This integration will lead to real-time and synchronized data, assisting timely and efficient delivery processes that are vital for maintaining sustainable business activity and the food trading company's competitive advantage. Besides, Loh et al. (2024) specifically highlighted that the capability to provide advanced digital solutions is significantly related to enhancing customer satisfaction levels, thus impacting the timeliness and reliability of export item deliveries.

Research Aim 2:

The participants proposed several recommendations to address the causes of the late delivery of the food trading company's export items. The recommendations are 1*) INTEGRATING SYSTEM INFORMATION* and 2) *RESOURCING ALTERNATIVE SHIPPING AGENTS*. The participants emphasized these recommendations during the interview sessions as practical solutions to address the issue of the late delivery of export items in the food trading company.

The *INTEGRATION INFORMATION SYSTEM* is highly proposed by the participant as one of the vital solutions to address the issue of *INACCURATE INFORMATION* and the *LIMITATION OF THE SYSTEM.* The participants suggested that *INTEGRATING SYSTEM INFORMATION* relevant stakeholders, including the warehouse operation team and the customer service department, can more effectively utilize data in delivery activities,

therefore enhancing customer satisfaction. This is because if the issue of *INACCURATE INFORMATION* and *LIMITATION OF THE SYSTEM* is not resolved, it will impact the warehouse's ability to verify customer feedback from the customer service department. This finding aligns with the views of Ju et al. (2019) and Siagian et al. (2020), who pointed out that *INTEGRATING SYSTEM INFORMATION* plays an essential role in effectively managing the flow of goods and enhancing the process of receiving information, thus leading to more efficient and punctual deliveries. The integrated system information acts as a "checks and balances" mechanism, ensuring the preciseness of information and enabling the handling of large order volumes. Besides, *INTEGRATING SYSTEM INFORMATION* supports efficient storage and tracking, which is crucial to monitor delivery performance and enhance system capabilities.

Another recommendation proposed by the participants during the interview session is *RESOURCING ALTERNATIVE SHIPPING AGENTS*. According to the participants, *RESOURCING ALTERNATIVE SHIPPING AGENTS* is the key solution to address *INEFFICIENT PRODUCTION PROCESS* and *TRANSPORTATION SCHEDULING*.

RESOURCING ALTERNATIVE SHIPPING AGENTS with good track records could be an alternative approach to improve the company's delivery operations, especially concerning the late delivery of export items. These alternative shipping agents have the necessary capabilities and expertise to handle delivery tasks effectively, ensuring that operations are handled effectively. Besides, they are equipped with the appropriate facilities, equipment, and resources to guarantee timely delivery to their customers. Furthermore, these shipping agents are committed to investing in value-added services and sophisticated *TRANSPORTATION SCHEDULING* systems to meet customer demand. By partnering with reliable *ALTERNATIVE SHIPPING AGENTS,* the food trading company could improve its delivery operations, mitigating the issue of late deliveries (Obiero, 2019; Huiwen et al., 2023).

5. Managerial Implications and Recommendations

This study offers substantial managerial implications for the food trading company, particularly in addressing the late deliveries of export items to the food trading company. The study identified four main causes of late delivery, namely: 1) *LIMITATION OF THE SYSTEM*, 2) *INACCURATE INFORMATION*, 3) *TRANSPORTATION SCHEDULES*, and 4) *INEFFICIENT PRODUCTION PROCESSES*. To address these identified causes, managers at the food trading company are advised to consider the recommendations proposed by the participants of the study, which is the 1) *INTEGRATION OF SYSTEM INFORMATION*, which can significantly mitigate the risks associated with *LIMITATION OF THE SYSTEM and INACCURATE INFORMATION*. This strategic integration can lead to more accurate forecasting, enhanced decision-making, and, ultimately, more reliable delivery schedules for its export items.

Furthermore, the study suggests *RESOURCING ALTERNATIVE TRANSPORTATION AGENTS* as a practical solution for overcoming obstacles related to *TRANSPORTATION SCHEDULING* and *INEFFICIENCIENT PRODUCTION PROCESSES*. By partnering with shipping agents with good track records, the company can leverage external expertise and infrastructure to ensure more efficient transportation and production workflows. This collaboration not only aims to enhance the punctuality of deliveries of the export items but also contributes to the company's overall operational efficiency.

Thus, it can be concluded that managers of food trading companies should prioritize adopting integrated systems and the strategic selection of transportation partners as essential steps toward improving the delivery performance of export items. Implementing these solutions will not only address the immediate challenges of late deliveries but also guarantee the company’s long-term international competitiveness and customer satisfaction.

With regard to recommendations for future studies, it is advisable to incorporate a large sample size to gain in-depth insights into the topic and recommend approaches to various trends in the trading industry. The identified cause of the late delivery process from the larger sample size could provide a better perspective on maintaining the good delivery performance of the export items.

Besides, future research studies can employ quantitative measurements. The findings of the quantitative analysis would provide significantly solid data to validate the identified factors. Moreover, customer satisfaction analysis should also be an integral part of future studies to analyze the strength of the association between delivery performance and customer satisfaction by exploring the reliability of the relationship.

Conclusion

The food trading company's commitment to on-time delivery is critical, not only for maintaining its reputation but also for the success of its export and import activities. Due to the critical nature of delivery performance, the study initiated two key research aims, which are to uncover the root causes of late delivery of the export items and subsequently to propose some practical solutions to address the identified causes. The research methodically applied has achieved these aims, yielding comprehensive insights that informed the study's goal of improving the timeliness of the company's export item deliveries.

This study employed a qualitative approach, specifically the case study with purposive sampling, selecting participants who brought relevant expertise and experience to the export items delivery process analysis. The interview sessions with the participants or the food trading company's employees facilitated an exploration of the factors contributing to delivery delays, ensuring that the data collected directly supported the study's aims. The feedback from various company employees was analyzed thoroughly and illustrated via the lens of an Ishikawa diagram. The Ishikawa diagram pinpointed the causes, such as *inaccurate information, inefficient production processes, problematic transportation scheduling,* and *system limitations*. The study not only highlighted the causes that prevent on-time delivery of export items at the food trading company but also proposed some actionable solutions. The recommendations proposed by the participants are integrating system information and partnering with reliable alternative shipping agents to streamline delivery operations of its export items.

In light of the findings, one practical recommendation is the adoption of an integrated system tailored to the food trading company's needs. The proposed system would enable the company to identify, aggregate, and analyze customers' orders, thereby enhancing its understanding of customer preferences and improving its delivery forecasting accuracy. This strategic implementation of an integrated system could be a game-changer for the food trading company, providing the company with the insights to optimize order fulfilment and elevate the overall delivery performance of its export items.

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Investigating Factors Shaping Sunnah-Based Product Consumption among University Students

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Abstract: Health problems have increased because of modern lives, especially in young people because of poor nutrition and improper eating habits. Inspired by Islamic teachings, especially the Quran and the Sunnah of the Prophet Muhammad (PBUH), this study attempts to investigate the factors impacting Sunnah-based product consumption among Muslim college students. Data were gathered by utilizing a correlational research approach and questionnaires given to 476 Muslim university students. According to the study, 96.6% of respondents were aware of Sunnah-based products, and a sizable majority (93.9%) favored them. Childhood exposure to such products (44.3%) points to familial or cultural impacts. The frequency of consumption varied, though, with 41.8% consuming Sunnah-based goods on occasion. Taste concerns were negligible (12.0%) and accessibility issues (23.9%) emerged as the main obstacles to consumption, followed by high pricing (56.5%). Positive sentiments notwithstanding, real-world barriers impede widespread adoption. These results highlight how critical it is to remove obstacles preventing Muslim youth from using Sunnah-based products. Interventions can be designed to encourage healthy eating habits in line with Islamic teachings by knowing the factors influencing their decisions. This will ultimately improve the general health and well-being of Muslim communities.

Keywords: *Sunnah food, Sunnah-based products, University students, Malaysia*

1. Introduction and Background

Modern civilization is experiencing an increase in health issues because of unhealthy eating conditions, obesity, poor nutrition, and unhealthy eating habits among young individuals. Scientific studies indicate that unhealthy and unbalanced diets increase the risk of diabetes, cardiovascular disease, and hypertension. Allah has stated in the Holy Quran in Suratul Al-Baqarah (2:172) that Muslims must eat "good things," which are the nutritious, hygienic, pure, and wholesome foods that the Almighty has provided for humankind. Muslims should take great inspiration from the Prophet Muhammad (PBUH) to attain and maintain excellent physical and mental health. Muslims must also follow and put into practice all the teachings of the Prophet Muhammad (PBUH), according to Suratul Al-Nisa (4:59). In addition, society can benefit greatly from the Prophet's teachings on eating and other aspects of life.

Our eating habits today are quite different from those of previous generations. Emerging, possibly lethal illnesses connected to nutrition are a sign that something is wrong with our lifestyle, particularly the way we eat. The right diet can have a significant influence on the heart and even the spirit, so it must be carefully chosen. Green (1979) is another Western scientist who agrees that an individual's identity is greatly shaped by their heart. The Prophet Muhammad (PBUH) said in a well-known hadith, "In a body, there is a lump of flesh; if the flesh is good, the whole body becomes good and if the source is bad, the whole body becomes bad and indeed it is the heart" (Al-Bukhari, 2002).

Sunnah foods are those that have been examined in the Hadith and al-Quran and have been shown to have several health benefits. Additionally, it is the guidance given to Muslims by the Prophet Muhammad (PBUH) to live better and healthier lives (Hashman, 2011). Sunnah food labeling must also adhere to the fundamentals of halal and good (*halalan toyyiban*), which begin with the preparation of raw materials and continue through material processing until the finished product is completed. The traditions and practices of the Prophet Muhammad (PBUH) are known as the "sunnah," an Arabic term, and are intended to be followed by all Muslims. Islamic dietary rules are based on the Prophet Muhammad (PBUH)'s sunnah, or recommended, eating regimen.

But even with the possible health benefits and religious prohibitions, there is still a lack of knowledge about what factors influence the use of sunnah-based products, especially among Muslim college students. It is

imperative to close this gap since eating choices have a big impact on general health and well-being. Therefore, it is essential to investigate the factors influencing Muslim university students' usage of sunnah-based products by (i) identifying the underlying factors influencing Muslim youth in the consumption of sunnah-based products, (ii) examining the relationship between social norms and the consumption of sunnah-based products among Muslim university students and (iii) investigating the relationship between health considerations and the preference for sunnah-based products among Muslim university students.

2. Literature Review

Allah granted Prophet Muhammad the position of Uswah Hasanah (role model). Allah SWT stated that the Prophet Muhammad serves as a positive example for believers. Surah Al-Ahzab 33:21 and Surah Al Qalam 68:4 highlight the Prophet Muhammad (PBUH) as a role model for Muslims. The Prophet Muhammad (PBUH) serves as a model for mankind, with his health and personal hygiene practices providing advice for his followers. Following a Sunnah diet, based on the teachings of Prophet Muhammad (PBUH), significantly improves human health, and positively impacts an individual's overall well-being. The Quran and Sunnah promote nutrient-rich foods and prohibit consuming anything shown to be hazardous or with more disadvantages than benefits. Sunnah food, which includes herbal knowledge, sanitation, and dietary practices, originated during the time of the Prophet Muhammad (PBUH). It includes medicinal recipes that the Prophet (PBUH) used for his treatment or recommended for others. Furthermore, it includes practical guidance for human health, such as daily dietary habits and strategies for preventing and managing illnesses.

The Quran offers profound guidance on nutrition, underscoring its significance for humanity's well-being. In Surah Al-Baqarah 2:168, a directive is issued to mankind, urging them to consume what is lawful and wholesome on the earth. This verse emphasizes the importance of adhering to dietary practices that are permissible and beneficial, reflecting a holistic approach to sustenance. Similarly, Surah Ta-Ha 20:81 admonishes individuals to partake of the provisions bestowed upon them by the Divine, emphasizing the consumption of wholesome and nourishing sustenance.

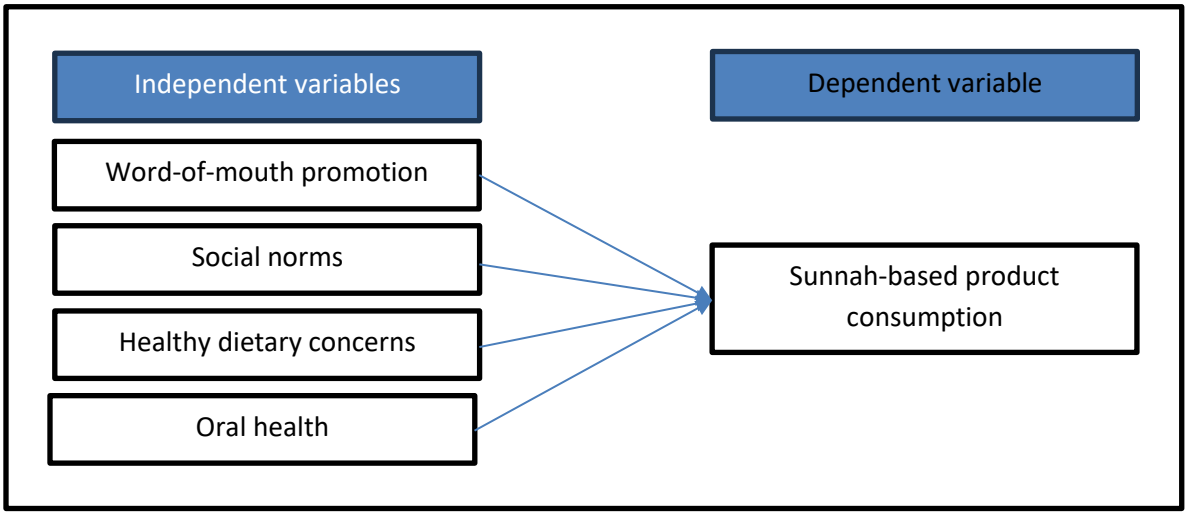
The consumption of Sunnah-based products among university students holds significant cultural, religious, and health-related implications within Muslim communities. Understanding the factors influencing the consumption patterns of Sunnah-based products is essential for elucidating the complex interplay between cultural practices, religious beliefs, and consumer behavior among this demographic. Investigating factors shaping Sunnah-based product consumption among university students reveals a multifaceted interplay of cultural, religious, and health-related influences. Sunnah-based products, rooted in the teachings of Prophet Muhammad (PBUH), carry significant cultural and religious significance within Muslim communities, symbolizing adherence to prophetic traditions and preserving cultural heritage. Studies highlight the cultural importance attached to Sunnah-based product consumption among university students, reflecting a desire to uphold religious teachings and maintain cultural identity (Syed Hassan & Baharuddin, 2021; Ishak et al., 2013).

Additionally, Sunnah-based products are valued for their potential health benefits, with items such as honey, black seed oil, and *miswak* praised for their medicinal properties and nutritional value (Al-Ghazal & Mawas, 2020). Peer interactions, family dynamics, and societal norms play a pivotal role in shaping consumption patterns, with word-of-mouth promotion, social norms, and peer recommendations influencing product preferences and purchasing decisions (Michaelidou, & Hassan, 2014; Ajzen, 2015). Despite the merits of Sunnah-based product consumption, university students may encounter barriers such as cost, availability, and awareness. Practical challenges, coupled with competing consumer preferences, may hinder widespread adoption among student populations, necessitating collaborative efforts to promote awareness, affordability, and accessibility of Sunnah-based products on university campuses and beyond. Further research is warranted to explore the nuanced dynamics of Sunnah-based product consumption and its implications for the health and well-being of university students.

Figure 1 below shows the framework of the study that highlights the relationships between factors that influence students' Sunnah-based product consumption. The factors comprise word-of-mouth promotion, social norms, healthy dietary concerns, and oral health. Studies have shown that word-of-mouth promotion influences product consumption (Gildin, 2022; Liu et al., 2021). Similarly, previous studies have shown that

social norms influence consumers' product consumption (Ali et al., 2023; Hosta, & Zabkar, 2021). Healthy dietary concerns are associated with consumers' product consumption in previous studies (Alae-Carew et al, 2022; Petrescu et al., 2020). Another variable that is important to influence product consumption is oral health. Studies have also shown that oral health is one of the reasons consumers choose products to consume (Janakiram et al., 2020; Yang et al., 2020). Based on the discussion, the following research framework is proposed.

Figure 1: Research framework of the study depicting the relationship between influential factors and Sunnah-based product consumption among students



3. Research Methodology

A correlational research design was used for the investigation. Data were collected using personally administered questionnaires from students at public universities. With a total of 34 items on a 5-point Likert scale that ranges from 1 (strongly disagree) to 5 (strongly agree), this study employed a quantitative research methodology using instruments from multiple sources, including Islamic and scientific materials. The sampling frame for this study comprised final-year students of the Faculty of Health Science, Universiti Teknologi MARA (UiTM), Puncak Alam. The physical questionnaire was personally distributed to selected Muslim university students by the researchers. At the end of the data collection period, a total of 476 sets of questionnaires were collected, indicating a 100% response rate. Data were analyzed using Statistical Package for the Social Sciences Software (SPSS) version 28.0.

4. Results

Referring to Table 1, the study included a total of 476 participants, and 70% of them were women. Most participants (65.3%) were between the ages of 21 and 23, which aligns with their current academic endeavors. Based on the findings, most respondents (96.6%) were aware of Sunnah-based products, and many of them (93.9%) preferred these products over other alternatives. A noteworthy finding was that a sizeable segment of the respondents (44.3%) had been exposed to Sunnah-based products at an early age, possibly due to cultural or familial customs. 25.2% of the respondents started consuming them more recently. The frequency of consumption varied among respondents, with 41.8% occasionally consuming Sunnah-based products and 38.9% rarely doing so. While respondents generally held favorable views towards Sunnah-based products, the biggest barriers to their use were high prices (56.5%) and accessibility issues (23.9%). A small group of respondents (12.0%) expressed concerns about the taste or lack thereof. Despite the younger generation's receptiveness to these products, the practical hurdles such as cost and availability could impede their widespread adoption.

Profile of Respondents: Table 1 summarizes the characteristics of the total sample of students who participated in the study.

Table 1: Respondents' Profile

VARIABLE	FREQUENCY	PERCENTAGE
GENDER		
Males	143	30%
Females	333	70%
Total	**476**	**100%**
AGE		
18-20	12	2.5%
21-23	311	65.3%
24-26	121	25.4%
27 and above	32	6.7%
Total	**476**	**100%**
SUNNAH-BASED PRODUCT KNOWLEDGE		
Yes	460	96.6%
No	16	3.4%
Total	**476**	**100%**
SUNNAH-BASED PRODUCT PREFERENCE		
Yes	447	69.5%
No	29	5.5%
Total	**476**	**100%**
FIRST-TIME CONSUMED SUNNAH-BASED PRODUCTS		
None	52	10.9%
Childhood	211	44.3%
Recently	120	25.2%
Teenagerhood	93	19.5%
Total	**476**	**100%**
FREQUENCY OF CONSUMING SUNNAH-BASED PRODUCTS		
Most of the time	42	8.8%
Sometimes	189	41.8%
Always	50	10.5%
Seldom	185	38.9%
Total	**466**	**100%**
REASONS FOR NOT CONSUMING SUNNAH-BASED PRODUCTS		
Hard to get	114	23.9%
Expensive	169	56.5%
Tasteless	57	12%
Others	36	7.8%
Total	**376**	**100%**

Table 2 shows the results of factor analysis for the independent variables. A principal component factor analysis with varimax rotations was performed to examine the dimensionality of items measuring the contributing factors of Sunnah-based product consumption. The results of the factor analysis show that the test produced a desirable outcome with a KMO value of .851, which indicates a sufficient correlation matrix for performing the analysis. Bartlett's test of sphericity is significant at the 0.01 level.

From the results, four factors are extracted explaining 59.9% of the variance in the model. The first factor contains five items measuring word-of-mouth promotion of Sunnah-based products. The factor loadings range from .709 to .784. The second factor also contains five items measuring social norms including values, attitudes, and behavior. The factors loadings are from .623 to .794. The third factor has four items meant to assess healthy

dietary concerns. This factor has loadings ranging from .524 to .849. The last factor concerns oral health which was measured using four items. The factor loadings range from .480 to .788. The average (mean) value of items representing the respective factors was calculated to be used in the subsequent analysis.

Table 2: Results of factor analysis of the independent variables.

		Component			
		1	2	3	4
I know someone who has consumed sunnah-based products and the benefits of consuming them.		.784			
I trust my relatives and friends to share their experiences after consuming Sunnah-based products.		.774			
I received information about sunnah-based products from my relatives and friends.		.737			
My relatives and friends seem to enjoy sharing their knowledge about Sunnah-based products with me.		.724			
Most of my relatives and friends recommended me to consume sunnah-based products.		.709			
Consuming sunnah-based products allows for controlling personal health.			.794		
I used to consume sunnah-based products because of the easiness of preparing the food.			.762		
I am willing to spend more of my money to purchase Sunnah-based products.			.673		
I used to consume sunnah-based products because the ingredients consisted of healthy food.			.631		
I recommended others to consume Sunnah-based products.			.623		
Milk is the best drink described in Al Quran.				.849	
Either 'Habbatussauda' can cure all diseases except death.				.804	
Honey is the most nutritional food mentioned in Al-Quran.				.756	
The level of health is the factor that I consume Sunnah-based products.				.524	
I used to choose the ingredients that contained 'Kayu Sugi' in my toothpaste.					.788
Using 'Kayu Sugi' will give me good health for my teeth.					.777
I will ask my family and friends to change their toothpaste which consists of 'Kayu Sugi' contains in toothpaste.					.586
'Kayu Sugi' is the best which to replace the toothbrush.					.480
% of variance explained (59.9%)		17.4	16.6	14.7	11.2
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.					.851
Bartlett's Test of Sphericity	Approx. Chi-Square				3250.272
	Df				153
	Sig.				.000

Table 3 shows the results of factor analysis for the dependent variable. The factor analysis produced a desirable outcome since the KMO value is higher than the threshold value of 0.6 (KOM=.818). Bartlett's test of sphericity is significant, indicating that there is enough correlation between items to proceed with the test. The dependent variable, Sunnah-based product consumption, has six items with loadings ranging from .484 to .781. The average (mean) value of the six items was calculated to be used in the subsequent analysis.

Table 3: Results of factor analysis of the dependent variable.

	Component
	1
The ingredients of Sunnah-based products are out of curiosity and Halal.	.781
Sunnah-based products have high nutrients.	.764
Sunnah-based products are free from chemical and artificial ingredients.	.762
Sunnah-based products are better than any other supplement.	.740
Sunnah-based products should be made for scientific research for their validity, efficacy, and benefits to health.	.597
I am highly aware of Sunnah-based products.	.484

% of variance explained		48.6
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.818
Bartlett's Test of Sphericity	Approx. Chi-Square	748.138
	Df	15
	Sig.	.000

Table 4 shows the results of descriptive, reliability, and correlation analyses. For descriptive analysis, Sunnah-based product consumption recorded the highest mean value (M=4.12; SD=.53) while word-of-mouth promotion scored the lowest (M=3.49; SD=.73). These findings indicate that the respondents are consuming Sunnah-based products, but they are less willing to promote the products to others because it is not the Malaysian culture to promote something to others. Results of the reliability analysis are presented in parentheses along the diagonal. Word-of-mouth promotion had the highest Cronbach's alpha value (α=.848) while Oral health scored the lowest (α=.609) but is still considered acceptable for the study.

Regarding the results of the correlation analysis, all independent variables are significantly correlated with each other (moderate to low correlation), indicating convergent validity. The highest correlation score is between word-of-mouth promotion and social norms (r=.296; p<.01) and the lowest correlation score is between health dietary concerns and oral health (r=.490; p<.01). Furthermore, all independent variables are significantly related to the dependent variable, indicating concurrent validity. The highest correlation score is between health dietary concerns and Sunnah-based product consumption (r=.534; p<.01) and the lowest correlation score is between word-of-mouth promotion and Sunnah-based product consumption (r=.342; p<.01).

Table 4: Results of descriptive, reliability, and correlation analyses

No		Mean	SD	1	2	3	4	5
1	Word-of-Mouth Promotion	3.49	.73	(.848)				
2	Social Norms	3.77	.64	.490**	(.796)			
3	Healthy Dietary Concerns	4.07	.64	.394**	.252**	(.790)		
4	Oral Health	3.60	.59	.301**	.321**	.296**	(.609)	
5	Sunnah-based Product Consumption	4.12	.53	.342**	.368**	.534**	.406**	(.778)

Notes: **. Correlation is significant at the 0.01 level (1-tailed); N=476; Cronbach's alphas along the diagonal in the parentheses

The analysis proceeded with a multiple regression analysis and the results are shown in Table 5. The R square value of .385 indicates that 38.5% of the variance in the regression model is explained by the four independent variables. The remaining variance is the unexplained variance, thus, requiring the consideration of additional variables in future studies. The regression model is significant ($F(4, 471)=73.704$; p<.01). Out of four variables, word-of-mouth promotion is not significant (β=.024; p>.05). The most plausible reason for the finding is that Malaysian consumers are less likely to engage in a voluntary act of promoting any products because it is not ingrained in our culture. The other three variables are significant; social norms (β=.182; p<.01), healthy dietary concerns (β=.414; p<.01), and oral health (β=.218; p<.01). As expected, these three variables are the significant predictors of Sunnah-based product consumption because as Muslims, the consumers are well-informed on the values of the products, the nutritional content of the products for physical health and the benefit of the products for oral health. All these contribute to the consumption of the Sunnah-based products among the consumers.

Table 5: Results of a multiple regression analysis

	Standardized Coefficients	
	Beta	**Sig.**
Word-of-Mouth Promotion	.024	.587
Social Norms	.182	.000
Healthy Dietary Concerns	.414	.000
Oral Health	.218	.000
R	.620	

R square	.385
Adjuster R Square	.380
F value	73.704
Sig. F value	.000
Durbin Watson	1.711

Discussion

In Muslim communities, the consumption of Sunnah-based products holds significant cultural and religious importance. It is crucial to learn the factors influencing the consumption patterns of these products among university students.

Based on the present study findings, there are valuable insights into the consumption patterns and determinants of Sunnah-based products among university students. According to this present study, a significant proportion of respondents were aware of Sunnah-based products and expressed a preference for them over other alternatives. Most respondents believed in possessing knowledge about sunnah-based products, which became their preference. This aligns with previous research emphasizing the cultural and religious significance of Sunnah-based products within Muslim communities (Syed Hassan, & Baharuddin, 2021; Ishak et al., 2013; Anwar, & Yusoff, 2022). Nearly all the respondents were exposed to Sunnah-based products at an early age, possibly due to cultural or familial customs. This highlights the influence of socialization and cultural practices in shaping consumer preferences from a young age (Hota, & Bartsch, 2019). Moreover, it is said that children's eating style will follow their family's eating style (Akar, 2023). On the other hand, nearly half of the people who participated in the survey stated that they sometimes skipped consuming these goods because of the expensive elements as reasons for choosing not to buy sunnah-based products.

Although the younger generation is responsive to these items, it is possible to conclude that the broad acceptance of these products could be hindered by practical challenges such as the cost and availability of these products. This is aligned with a study that found that most respondents have a high level of knowledge on sunnah food, however, there are practical challenges in eating them because of their availability and capability of securing them from the local market. Thus, it is suggested that the government reduce the cost of Sunnah foods such as olives, pomegranates, figs, and dates and always make them available to the population, including Eastern Malaysia such as Sabah and Sarawak (Latif & Rahman, 2020).

Correlation analysis confirmed the convergent and concurrent validity of the identified factors, further validating their relevance in explaining Sunnah-based product consumption behavior. A significant relationship was found between independent variables and the consumption of sunnah-based products. The independent variables include word-of-mouth promotion, social norms, healthy diet concerns, and oral health. The dependent variable highlights the interconnectedness of social, cultural, and health-related factors in shaping consumer choices (Michaelidou, & Hassan, 2014; Ajzen, 2015). The importance of healthy diets has significant implications for oral health. Both parental guidance during formative years and peer influences have shaped this behavior. Thus, embracing healthy dietary behavior is conducive to enhancing the overall quality of life and promoting well-being.

Regression analysis provided additional insights into the predictive power of the identified factors on Sunnah-based product consumption. While word-of-mouth promotion did not emerge as a significant predictor, social norms, healthy dietary concerns, and oral health were identified as significant predictors. The present study findings indicate that the most significant predictor is the healthy dietary concerns among university students. This is aligned with previous studies that revealed the importance of social norms, health benefits, and oral hygiene considerations in influencing consumer preferences and behavior (Higgs, & Ruddock, 2020; Slavica, & Mirjana, 2023; Enshaei et al., 2018). In terms of Islamic literature, food and health are well established. Muslims are advised to consume good food and are taught to be careful about the food they consume, ensuring that it is halal, healthy, and good for their health. It is believed that one forbidden food that enters our body will affect not only our inner strength but even our children's inner strength. Those who practice Islam should be mindful of avoiding prohibited foods to be recognized as Allah's servants and raise a virtuous generation. The Muslims then need to ask Allah SWT for lawful sustenance and good deeds. In Surah Al-Baqarah 2:172, Muslims are obligated to consume good things, which refers to the nutritious, clean, pure, and nourishing foods that Allah

has made available for humans. The guidance of Prophet Muhammad PBUH concerning food and other aspects of life is a perfect guidance for society to Islam believers. Thus, sunnah foods encompass all aspects of nutrition, health, and psychological benefits to mankind. The Sunnah food has been appraised in the Quranic verses together with Hadith; and has been proven to have many benefits (Al-Ghazal, & Mawas, 2020). In terms of social norms, peer influence is becoming crucial in persuading students to consume sunnah-based foods, thus this factor could be used to promote behavioral change toward the consumption of sunnah-based food.

Nevertheless, the study findings of the insignificant variable of word-of-mouth fail to exert any contingent effect on consumer preference and actions. It is contrary to previous studies that found word-of-mouth promotion is a great tool to influence consumer preference and behavior. According to the findings of Wiratama et al. (2022), word of mouth has become the most impactful form of advertising that can influence consumer decision-making behavior. Moreover, a study conducted in Bangladesh assumed that word-of-mouth has a great impact on expensive items (Hossain et al., 2017). However, the current study findings indicate that when it comes to religious matters, which is a primary concern for Muslims, consumers cannot usually rely on the advice or words of others to make purchasing decisions regarding the consumption of food. However, the current study findings show that when it comes to religion, which is a primary concern for Muslims, consumers cannot usually rely on the advice or comments of others while purchasing food and beverages. They must be aware of and understand what they consume.

5. Conclusion

In essence, the findings of this study contribute to our understanding of Sunnah-based product consumption among university students. By identifying key determinants and barriers, as well as exploring the interrelationships between various factors, the study offers valuable implications for marketers, policymakers, and researchers. For marketers, effort should be channeled to create social influence via social media platforms because young consumers prefer, and trust product information distributed through social media platforms. Furthermore, the focus of the campaign should be on healthy dietary concerns and oral health as these two factors have been established to influence consumers' Sunnah-based product consumption. For policymakers, Sunnah-based products should become one of the diets among young consumers to develop their brain functions to the fullest. Relevant policies should be created to promote the products and avoid manipulation from retailers. Future studies should explore additional variables and employ longitudinal designs to further elucidate the dynamics of consumer behavior in this domain.

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Forecasting Short-Term FTSE Bursa Malaysia Using WEKA

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Abstract: This study investigates the use of machine learning methods, specifically utilizing the WEKA software, to predict stock prices of the FTSE Bursa Malaysia Kuala Lumpur Composite Index (KLCI). Two algorithms, Sequential Minimal Optimization Regression (SMOreg) and Multilayer perceptron (MLP), were employed for data analysis. Historical data from January 3, 2023, to December 29, 2023, was used to forecast open, high low, and close prices for ten days. Results from both algorithms were compared, with SMOreg proving to be more accurate than MLP for the dataset. However, it's important to note that further exploration of different forecasting algorithms may lead to even more precise results in the future. The findings of this analysis hold significant implications for investors, as they can use the insights gained to inform their investment strategies. By leveraging machine learning techniques like SMOreg within the WEKA framework, investors can potentially make more informed decisions regarding their stock market investments, leading to improved portfolio performance and risk management.

Keywords: *WEKA, Data Mining, stock market indices prediction, FTSE Bursa Malaysia KLCI.*

1. Introduction and Background

In today's ever-changing financial markets, the ability to forecast stock prices is crucial for investors, financial institutions, and market analysts (Gandhmal & Kumar, 2019; Kumar et al., 2022). The accuracy of these predictions is essential for achieving financial gains and minimizing losses (Emami, 2018; Farias Nazário et al., 2017). However, predicting stock market behavior is a difficult task due to its volatile and dynamic nature (Rouf et al., 2021). The stock market is affected by many interconnected factors, such as economic conditions, company performance, government policies and regulations, interest rates, and market sentiment. This complexity makes it challenging to forecast stock price movements, especially in the field of time series research (Dong et al., 2021). As a result, incorporating Machine Learning (ML) techniques has emerged as a promising approach to address these challenges in predicting stock market behavior (Zou et al., 2023). ML techniques, such as the use of WEKA (Waikato Environment for Knowledge Analysis), demonstrate the application of cutting-edge technologies in finance for stock market forecasting. These techniques have the potential to capture complex patterns in financial data and improve forecasting accuracy compared to traditional methods.

In the past, investors primarily relied on traditional tools to predict stock prices. These methods included fundamentals analysis (Al-Radaideh et al., 2013; Khadjeh Nassirtoussi et al., 2014), technical analysis (Farias Nazário et al., 2017; Kumbure et al., 2022; Navarro et al., 2023), market sentiment (Peng et al., 2023) and statistical techniques (Shah et al., 2022). However, with the widespread adoption of machine learning, investors now have an additional tool to enhance their predictions and make more informed decisions. Machine learning allows for the analysis of large amounts of data, identification of complex patterns, and adaptation to changing market conditions (Mintarya et al., 2022). Although traditional methods are still commonly used, the integration of machine learning has provided investors with valuable capabilities.

The popularity of machine learning has increased because it can identify non-linear trends and adapt to market changes that may be missed by traditional statistical methods. WEKA, a leading open-source project written in Java, is one of the most comprehensive tools for data mining. It includes state-of-the-art machine-learning algorithms for data pre-processing, classification, regression, clustering, association rules, and visualization (Frank et al., 2017). With this extensive range of tools, researchers and practitioners can explore different modeling techniques and choose the most suitable approach for their specific forecasting needs. WEKA's user-friendly interface makes it accessible to users with varying levels of expertise in machine learning including

researchers and practitioners (Rehman & Soomro, 2019). This accessibility reduces the barriers to utilizing advanced modeling techniques, enabling more individuals to leverage the power of data-driven insights for stock price prediction.

This paper examines predicting future stock market performance, particularly stock prices, by analyzing historical data of open, high, low, and close prices using the WEKA software. The process involves collecting and preprocessing relevant data. Two algorithms, SMOreg and MLP, are employed for stock price prediction due to their ability to effectively manage the intricacies of financial data and identify non-linear patterns in stock market activity. Our contributions are twofold. Firstly, this paper is the first to present the accuracy of the WEKA approach in forecasting Malaysian equities. Extant literature such as Abd Samad, Mutalib & Abdul-Rahman (2019) reports the applicability of using machine learning algorithms for stock price prediction however the study is limited to CIMB, Sime Darby, Axiata, Maybank, and Petronas stocks using the Random Forest algorithm. We, on the other hand, analyze the Malaysian equity index which is the bellwether for the country's economic sentiment. Secondly, unlike the conventional econometric methods used by Choudhry, Hasan & Zhang (2019), Dong, Guo, Reichgelt & Hu (2020), and Rubio & Alba (2022), we examine the data as-is, which means there is no data medication procedures to observe and stringent statistical requirements. Henceforth, with the new effort on using machine learning for stock market forecasting, we intend to go beyond the existing literature to enhance the body of knowledge and provide another significant contribution to academic and finance professionals. Leveraging machine learning techniques within the WEKA framework can enable investors to navigate the complexities of the stock market with greater confidence, leading to improved portfolio performance and risk management.

The remainder of this paper is organized as follows: Section 2 discusses the literature review, Section 3 explains the data description and methodology, Section 4 presents the results of empirical tests, and Section 5 provides the conclusion.

2. Literature Review

Stock price prediction plays a crucial role in financial markets as it enables investors, traders, and financial institutions to make informed decisions about buying, selling, or holding stocks. Accurate predictions help stakeholders mitigate risks, optimize portfolio returns, and capitalize on investment opportunities. In this context, machine learning techniques have emerged as powerful tools for enhancing forecasting accuracy and have gained significant attention. Among the various tools available for this purpose, WEKA (Waikato Environment for Knowledge Learning) stands out as a versatile and widely used open-source software developed by the University of Waikato, New Zealand. Equipped with a plethora of machine learning algorithms, WEKA offers comprehensive tools for data pre-processing, classification, clustering, regression, association, and visualization (Frank et al., 2017).

Kumar and Ravi (2016) conducted a thorough review of text-mining applications in finance, shedding light on how textual data analysis through text-mining methods contributes to predicting trends and outcomes in the financial domain. Their study underscored the significance of text mining in forecasting financial events. In a similar vein, Kulkarni and More (2016) applied machine learning techniques, specifically utilizing WEKA, to predict stock prices. Their research explored different stock market forecasting processes within WEKA's forecasting plugin and conducted experiments on various stocks to analyze the tool's predictive capabilities. Further, Žmuk and Jošic (2020) aimed to forecast stock market indices using machine learning algorithms, including those available in the WEKA tool. Their study evaluated the efficiency of machine learning algorithms for predicting stock market indices, emphasizing WEKA's role in tasks such as data pre-processing, classification, regression, clustering, association rules, visualization, and forecasting. Rehman and Soomro (2019) leveraged the WEKA tool to analyze OGDCL stock prices and predict open, high, low, and close prices for ten days using SMOreg and MLP algorithms.

Machine learning methods, including those implemented in WEKA, have shown superior performance compared to traditional forecasting methods like time series analysis, econometric models, and fundamental analysis. Studies have demonstrated that machine learning algorithms outperform traditional methods for medium to long-term predictions (Iaousse et al., 2023). Additionally, incorporating machine learning

approaches, significantly outperforms conventional methods, showcasing the potential of machine learning in handling complex datasets with consistent and reliable performance (Patil et al., 2024). Furthermore, research utilizing WEKA for share price prediction found that Sequential minimal optimization provided more accurate results compared to other methods, highlighting the effectiveness of data mining techniques in financial forecasting Devi, et al. (2023).

Overall, these studies highlight the diverse applications of WEKA in predicting stock market trends and prices. From text mining applications to forecasting individual stock prices and overall market performance, WEKA emerges as a valuable tool in the arsenal of financial analysts and researchers.

3. Methodology

Data Description

In our study, we collected data from Refinitiv over a 1-year sample period, spanning from January 3, 2023, and ending on December 29, 2023. We excluded weekends and public holidays from our data collection. The amount of historical data required depends on the prediction horizon. For short-term predictions such as the next 10 days, 1-2 years of daily price data can be sufficient. Previous studies have used different lengths of historical data for stock prediction using WEKA. For instance, Rehman and Soomro (2019) utilized one year and three months of daily data to forecast OGDCL stock prices, while Jošić, (2020) used historical daily close prices from 1, 5, and 10-year periods to predict major stock indices 5, 10, 15, and 20 days ahead.

The daily data collected was used to evaluate the effectiveness of Weka 3.8.6 in forecasting the FTSE Bursa Malaysia KLCI index. Our objective was to assess Weka's performance as a forecasting tool following the methodology of the previous study by Rehman and Soomro (2019). We used the Weka to predict the open, high, low, and close prices for the next ten days, comparing them to the actual prices. Two forecasting algorithms, namely SMOreg and MLP, were utilized. Data preprocessing was conducted to address missing values, and outliers, and normalize variables for consistent input into the machine learning models.

Multilayer Perceptron (MLP)

Multilayer Perceptron (MLP) in a Weka is a neural network classifier known for its effectiveness in solving classification and prediction tasks (Md Salim Chowdhury et al., 2024). The process begins with the input layer, where input variables from the dataset are received. The information then passes through hidden layers, updating weights and utilizing activation functions to interpret the data's nonlinearity. The output layer ultimately produces the final result, which may be a class label or a prediction. This tool is widely utilized in different applications and can be trained using the backpropagation algorithm. MLPs have the ability to learn complex, nonlinear relationships between inputs and outputs. They have been successfully applied to diverse problems such as image classification, natural language processing, and financial forecasting.

Sequential Minimal Optimization (SMOreg)

SMOreg, also known as Sequential Minimal Optimization, is a technique utilized to predict numerical values using Support Vector Machine (SVM) for regression. It addresses the intricate mathematical problem of quadratic programming optimization, which is crucial in SVM training. SMOreg simplifies this process by dividing the larger problem into smaller segments and solving them individually.

Both SMOreg and MLP algorithms are utilized for regression tasks and can achieve high accuracy in predicting results. The primary distinction between the two is that SMOreg utilizes the Sequential Minimal Optimization algorithm to solve the quadratic programming optimization problem associated with SVM for regression. In contrast, MLP typically relies on backpropagation to adjust connections between points based on prediction errors (Rashedi et al., 2024).

Mean Absolute Error (MAE)

When evaluating the accuracy of a prediction model, the Mean Absolute Error (MAE) metric is commonly used, especially in regression analysis. It measures the average absolute difference between the actual values and the predicted values of a dataset. Lower MAE values signify a higher level of predictive performance. Previous

studies such as Nirob and Hasan (2023) and Villavicencio et al. (2021) have employed the MAE to assess predictive accuracy.

The formula for Mean Absolute Error is:

$$MAE = \frac{1}{n}\sum_{i}^{n} = 1\ |Y_i - \hat{Y}_i|$$

Where:
In the dataset, n represents the total number of observations, yi refers to the observed value for the i^{th} observations while $y\hat{}i$ represents the predicted value for the i^{th} observation.

Root Mean Square Error (RMSE)
The error in a regression model can be measured using RMSE, which involves squaring the difference between the predicted and actual values and taking the average. In WEKA software, RMSE is used to evaluate the accuracy of a regression model in predicting continuous numerical outcomes. A lower RMSE value indicates better prediction accuracy. The calculation of RMSE follows this formula:

$$RMSE = \sqrt{\frac{1}{n}\sum_{i}^{n} = 1\ |Y_i - \hat{Y}_i|}$$

Where n represents the number of observations in the dataset, yi is the observed value for the i^{th} observations and $y\hat{}i$ is the predicted value for the i^{th} observations.

Mean Squared Error (MSE)
MSE is a widely used measure for assessing the precision of regression models. It calculates the average of the squared differences between the predicted values and the actual values in a dataset. A lower MSE signifies superior model performance, with a value of 0 representing a perfect fit (perfect predictions). The formula for calculating MSE is as follows:

$$MSE = \frac{1}{n}\sum i = 1^{n}\ (Yi - \hat{yi})^2$$

Where n is the number of observations in the dataset yi is the actual (observed) value for the i^{th} observations and $y\hat{}i$ represents the predicted value for the i^{th} observations.

Mean Absolute Percentage Error (MAPE)
MAPE is a metric used to evaluate the accuracy of a forecasting or predictive model, especially in the context of time series data. MAPE calculates the average percentage difference between the predicted values and the actual values in a dataset. It is particularly useful for assessing the relative accuracy of a model across different scales and periods. A lower MAPE value indicates a more accurate predictive model. A MAPE of 0% would indicate a perfect fit where the predicted values exactly match the actual values.
The Mean Absolute Percentage Error (MAPE) formula is as follows:

$$MAPE = \frac{100\%}{n}\sum_{i}^{n} = 1\ \left|\frac{yi - \hat{yi}}{yi}\right|$$

Where:
n is the number of observations in the dataset, yi is the actual (observed) value for the i^{th} observations and $y\hat{}i$ represents the predicted value for the i^{th} observations.

The distinction among these three methods lies in how they measure the difference. MAE calculates the average of the absolute differences between predicted and actual values. MSE calculates the average of the squared differences between predicted and actual values. As for RMSE, it's the square root of MSE.

4. Findings

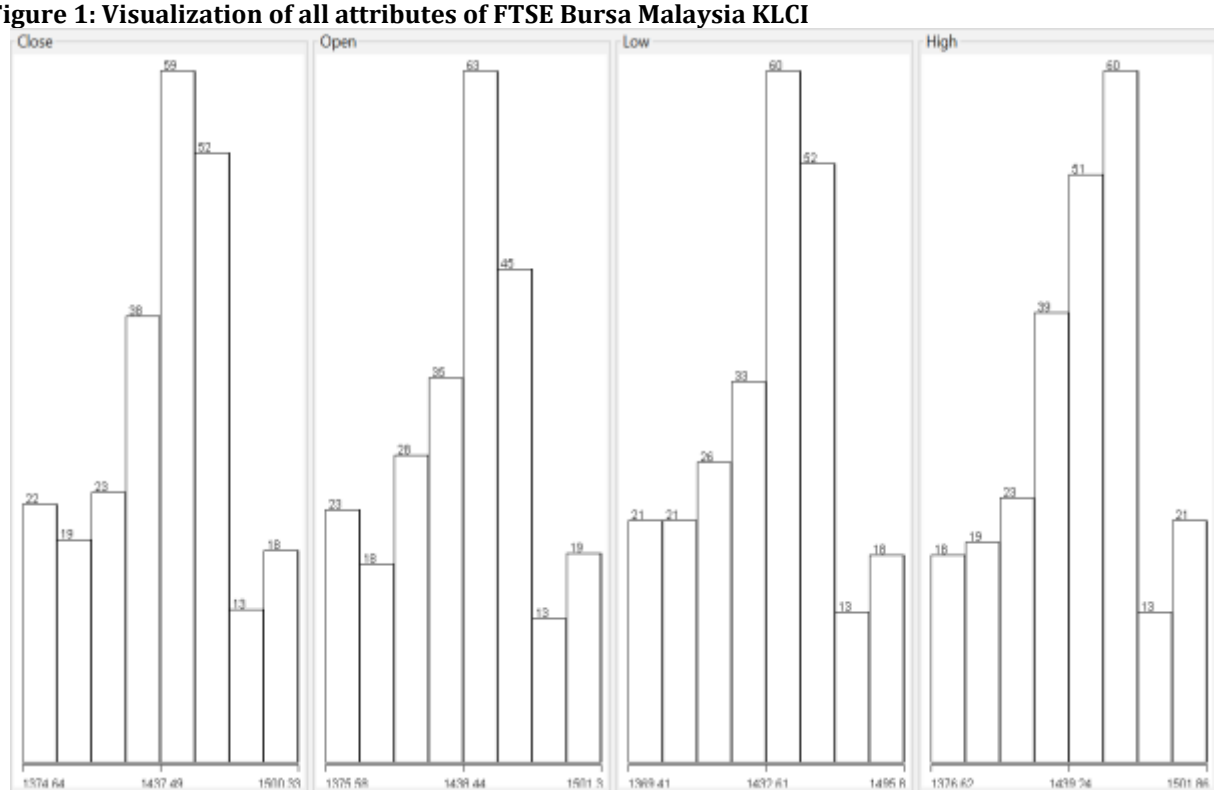
Descriptive Analyses: In this analysis, we utilized the WEKA tool to explore key descriptive statistics, aiming to gain insights into the historical trends and patterns that can help us forecast the stock market. The dataset used includes historical stock market data covering the period from January 3, 2023, to December 29, 2023, including daily open, high, low, and closing prices. The data spans a specified period, allowing us to forecast the 10-day future prices.

Table 1: Minimum, Maximum, Mean & Standard Deviation of Attributes

	Minimum	Maximum	Mean	Standard Deviation
Open	1374.64	1500.33	1438.891	29.978
High	1376.62	1501.86	1442.673	29.454
Low	1369.41	1495.8	1434.309	30.023
Close	1374.64	1500.33	1438.891	29.978

The descriptive statistics, presented in Table 1, provide a comprehensive overview of the data distribution. Notably, the minimum values for the open, high, low, and closing prices are recorded at 1369.41, while the maximum price peaks at 1501.86. This range between the maximum and minimum values reflects the extent of variability within the dataset, offering valuable insights into its distribution. The mean values for both the open and closing prices stand at 1438.891, representing central tendencies within the dataset. Additionally, examining the standard deviation reveals the dispersion of data points around the mean. In this context, the highest standard deviation of 30.023, observed in the low prices, underscores the extent of variability and potential fluctuations within this particular aspect of the dataset over the given period. Figure 1 shows the visualization for each attribute to visualize their distributions.

Figure 1: Visualization of all attributes of FTSE Bursa Malaysia KLCI



Results: In this study, we utilized Weka 3.8.6, which incorporates time series forecasting features. Four attributes, namely the open, high, low, and close prices of the KLSE, were included in the sample dataset that was put into the Weka experimental environment in CSV format. For the dataset, two algorithms SMOreg and MLP were applied for forecasting stock market predictions in Weka. Out of many other regression metrics, we choose MAE, MAPE, RMSE, and MSE as the basis of evaluation for the two forecasting models as shown in Table 2 below. These metrics are commonly used to measure the model's performance on stock price prediction (Jiang, 2021).

As depicted in Table 2, we compared the closing price of both algorithms and discovered that the values for metrics MAE, MAPE, RMSE, and MSE are lower for SMOreg over the next ten days. This trend persisted across the open, low, and high prices as well. This aligns with the findings of previous studies done by Ahmed and Hussain (2022); Žmuk and Jošic (2020); and Rehman and Soomro, (2019). Lower metric values indicate that the SMOreg algorithm may serve as a more accurate predictor in this context, as it produces forecasts that are closer to actual close prices.

$$MAE, MAPE, RMSE, MSE_{SMOreg} < MAE, MAPE, RMSE, MSE_{MLP}$$

To summarize, our results suggest that the SMOreg algorithm exhibits superior predictive capabilities compared to MLP, offering valuable insights for stock market forecasting applications.

Connection to the previous works

Our findings are in accordance with Abd Samad et al. (2019) and Ismail, Noorani, Ismail, Razak & Alias (2020) in the sense that incorporating the hybrid algorithm for financial forecasting tends to yield better results. Logically, the financial market dynamics consist of outliers hence we need the combination of machine learning algorithms to capture the actual market turmoil. As the financial market keeps evolving, there is no one-method-fits-all. Furthermore, the emerging stock markets have proven more efficient recently due to the increased sensitivity to global sentiment (Patra & Hiremath, 2022). Our paper presents a way of forecasting the Malaysian stock index with better computational power as a way to highlight the trajectory of the national financial sentiment.

5. Conclusion

In summary, the study aimed to use machine learning techniques in the WEKA framework to forecast stock prices. The SMOreg and MLP algorithms were employed to analyze historical data and make predictions. While SMOreg showed better accuracy in the dataset, further research is needed to explore forecasting algorithms. Diversifying methodologies is crucial for improving the reliability of stock price predictions in different market conditions.

These findings have practical implications for investors looking to enhance their investment strategies. By incorporating machine learning-based forecasts, investors can make better decisions on portfolio allocation, risk management, and timing of investments. The potential of SMOreg as a forecasting tool suggests its use in real-world investment practices, leading to improved performance and profitability.

In conclusion, the study provides valuable insights into the effectiveness of machine learning in stock price predictions, emphasizing the importance of ongoing exploration and innovation in this field. Advancing our understanding of forecasting algorithms can empower investors to navigate financial markets confidently and accurately.

Table 2: MAE, MAPE, RMSE & MSE for Open, High, Low & Close attributes obtained from SMOreg

		SMOreg															
		Close				Open				Low				High			
	N	MAE	MAPE	RMSE	MSE	MAE	MAPE	RMSE	MSE	MAE	MAPE	RMSE	MSE	MAE	MAPE	RMSE	MSE
Target		1.547	0.108	2 .300	5.294	4.059	0.283	5.456	29.777	2.690	0.188	3.672	13.488	2.402	0.167	3.424	11.720
I step ahead	237	4.679	0.326	6.192	38.337	6.358	0.443	8.182	66.940	5.361	0.375	7.154	51.178	4.931	0.342	6.665	44.426
2 step ahead	236	6.854	0.477	8.993	80.866	8.452	0.589	10.666	113.758	7.440	0.520	9.781	95.676	7.047	0.489	9.278	86.075
3 step ahead	235	8.838	0.616	11.352	128.866	9.887	0.689	12.431	154.533	9.345	0.654	11.965	143.152	8.815	0.612	11.342	128.639
4 step ahead	234	10.316	0.719	13.062	170.604	11.054	0.771	13.984	195.557	10.598	0.741	13.521	182.819	10.160	0.706	13.039	170.009
5 step ahead	233	11.477	0.800	14.553	211.785	11.820	0.824	15.093	227.790	11.663	0.816	14.823	219.717	11.330	0.788	14.361	206.245
6 step ahead	232	12.246	0.854	15.556	241.988	12.878	0.892	15.978	255.284	12.449	0.871	15.767	248.605	12.021	0.836	15.318	234.652
7 step ahead	231	13.234	0.923	16.473	271.358	13.515	0.942	16.760	280.906	13.383	0.937	16.641	276.923	12.884	0.896	16.048	257.528
8 step ahead	230	13.940	0.972	17.243	297.335	14.262	0.995	17.529	307.271	14.099	0.987	17.422	303.518	13.628	0.947	16.804	282.361
9 step ahead	229	14.700	1.025	17.984	323.431	14.940	1.042	18.216	331.820	14.800	1.036	18.118	328.259	14.274	0.992	17.466	305.047
I0 step ahead	228																

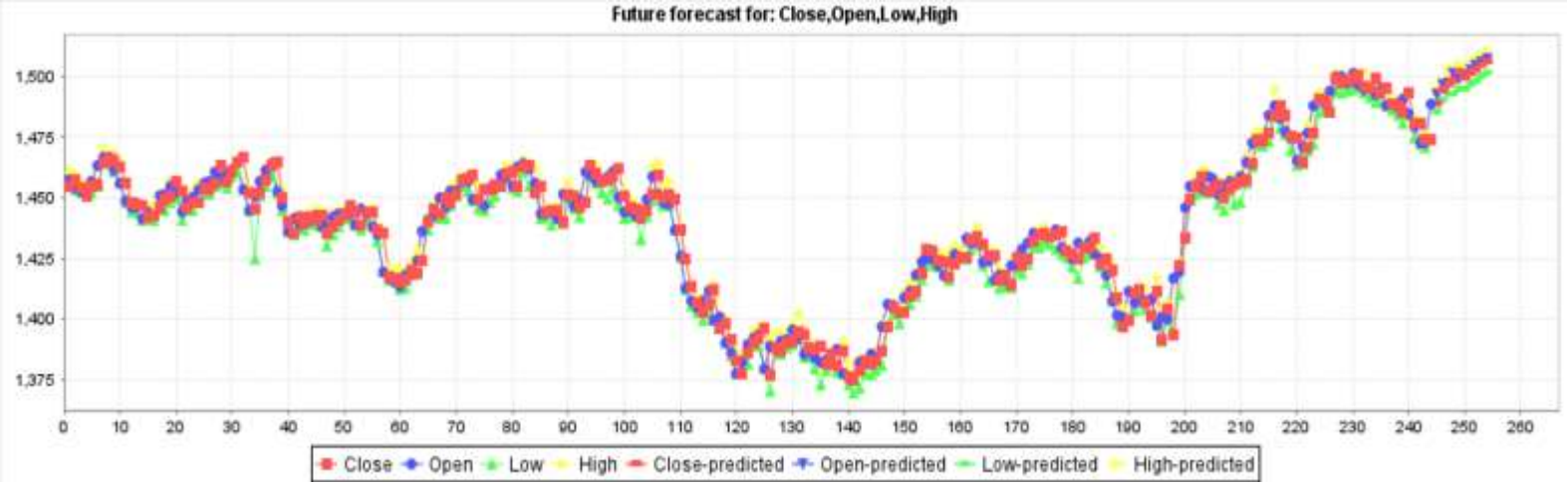
Table 3: MAE, MAPE, RMSE & MSE for Open, High, Low & Close attributes obtained from Multilayer Perceptron (MLP)

MLP															
Close				Open				Low				High			
MAE	MAPE	RMSE	MSE	MAE	MAPE	RMSE	MSE	MAE	MAPE	RMSE	MSE	MAE	MAPE	RMSE	MSE
2.197	0.153	2.886	8.332	7.284	0.506	8.538	72.891	7.067	0.493	7.766	60.315	3.335	0.231	4.316	18.626
8.237	0.574	9.683	93.765	14.870	1.032	16.617	276.135	14.728	1.027	16.107	259.435	10.209	0.708	11.753	138.132
16.319	1.134	18.385	337.995	24.018	1.667	26.075	679.926	23.319	1.625	25.055	627.772	18.613	1.289	20.514	420.811
25.723	1.787	28.098	789.473	33.140	2.299	35.423	1254.780	32.771	2.282	34.878	1216.502	27.541	1.908	29.695	881.792
34.869	2.421	37.432	1401.166	42.528	2.949	45.023	2027.069	41.786	2.908	44.072	1942.338	36.580	2.533	39.030	1523.302
44.684	3.100	47.389	2245.750	51.374	3.561	54.112	2928.070	50.091	3.485	52.571	2763.675	45.501	3.149	48.180	2321.284
54.566	3.783	57.425	3297.635	60.226	4.173	63.441	4024.802	58.588	4.073	61.383	3767.898	54.398	3.763	57.349	3288.866
64.071	4.439	67.369	4538.569	68.806	4.764	72.882	5311.739	67.113	4.664	70.537	4975.516	62.911	4.348	66.446	4415.087
72.240	5.002	76.357	5830.344	76.210	5.274	81.384	6623.344	74.631	5.184	78.921	6228.513	70.641	4.785	75.189	5653.356
78.999	5.466	84.118	7075.816	81.659	5.649	87.898	7726.081	80.738	5.606	85.855	7371.096	76.692	5.293	82.407	6790.901

Table 4: Comparing the Predicted and Actual Prices of FTSE Bursa Malaysia KLCI

SMOreg				MLP				Actual Rates			
Close	Open	Low	High	Close	Open	Low	High	Close	Open	Low	High
1488.874	1492.632	1485.534	1495.186	1393.52	1377.99	1375.44	1395.42	1453.100	1452.200	1446.360	1453.560
1494.086	1496.829	1490.454	1497.782	1496.022	1486.265	1484.062	1493.028	1462.370	1452.540	1450.170	1465.690
1496.795	1497.489	1493.068	1502.383	1492.412	1483.185	1480.849	1489.514	1477.260	1462.850	1461.030	1477.560
1498.231	1500.983	1492.948	1502.640	1485.604	1476.874	1476.651	1485.361	1487.610	1476.890	1476.850	1487.610
1502.065	1499.388	1495.027	1504.857	1480.366	1471.422	1469.627	1478.579	1495.700	1488.600	1488.600	1498.520
1499.686	1500.659	1494.804	1504.209	1474.889	1466.198	1464.044	1473.474	1498.830	1497.170	1496.840	1503.930
1501.260	1502.238	1496.877	1504.620	1468.882	1461.362	1460.237	1468.202	1486.860	1497.800	1486.720	1497.800
1502.936	1504.258	1497.945	1506.695	1463.708	1456.488	1454.345	1463.740	1483.000	1487.150	1483.000	1492.440
1505.172	1505.724	1500.119	1508.514	1457.953	1451.132	1448.690	1461.532	1487.340	1483.240	1482.020	1487.340
1506.124	1507.546	1501.701	1510.414	1453.038	1445.673	1444.384	1456.984	1501.110	1488.280	1487.810	1501.860

Figure 2: Graph of Future Trend Period by SMOreg in WEKA



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The Effect of False Advertising on Consumer Online Purchase Behavior with the Mediating Effect of e-WOM: Consumers in Malaysia

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Abstract: Advertising is one of the main contributors to the rising number of online shoppers worldwide. The use of advertising in this digital era has become a powerful tool for the persuasion of consumers. However, some organizations have adopted false advertising as their marketing strategy. The purpose of this study is to analyze the factors that influence consumers' online shopping behavior. The study focuses on the three independent constituent factors of false advertising, namely, unethical advertising, misleading information, and deception. The dependent variable is online purchase behavior. A questionnaire was distributed to 588 individuals who shopped once or more from the top e-commerce platforms in Malaysia. The questionnaire underwent validation and reliability assessments, followed by the collection and analysis of responses using SPSS software. The findings indicate that False advertising can have significant effects on consumer online purchase behavior in Malaysia. Through the use of misleading or false information, companies can manipulate consumer perceptions and ultimately influence their buying decisions. This can lead to several negative consequences for consumers, including financial losses, disappointment with purchased products, and erosion of trust in online shopping.

Keywords: *Online Shopping, Purchase Behavior, False Advertising, Unethical Advertising, Misleading Information, and Deception.*

1. Introduction and Background

In Malaysia, the expansion of Internet services has created a sizable retail market. Online selling has gained popularity in Malaysia in recent years. People began to adapt to the benefits of the online marketplace for both retailers and consumers. Retailers are benefiting from the cost-effective channel to reach their target consumers and consumers are benefiting from saving time, money, and more products to choose from (Alba et al., 1997). Businesses that have made the transition to the Internet are searching for goals beyond simple product or service sales. They aim to increase customer satisfaction and improve turnovers; they are soliciting feedback on their performance. It was reported that businesses all over the world have started to use the internet to lower their marketing expenses, and their product and service costs to maintain a competitive market going forward (Wu, 2013). Malaysia is one of the fastest-growing e-commerce markets in the ASEAN region with 19 million Malaysians using the internet as of the year 2018 (Salameh et al., 2022). Malaysians are the world's biggest users of social media and online shoppers in Malaysia are supporting a business worth 8.7bil and expected to reach 14.40bil by 2027(eCommerce - Malaysia | Statista Market Forecast, 2023). Online shopping is becoming more and more popular in Malaysia, yet as more people start using computers and mobile devices for online shopping, consumers still worry about payment security, the validity of data protection, inadequate information disclosure, and product quality (Amin & Mohd Nor, 2013).

A product or service's buying choice is influenced by an audience through the use of advertising as a communication tool. An advertisement provides details about a good or service to the public. According to Haider and Shakib (2018), advertising is regarded as a crucial and vital element for the expansion of the economic processes of marketers and enterprises. According to Ahmed and Ashfaq (2013), advertising is a form of exposure or promotion that is paid for by a sponsor and broadcast through a variety of media platforms. Companies are always attempting to sway consumers' opinions, assessments, and purchasing choices (Romaniuk, & Sharp, 2004).The purchasing habits of consumers have long been a crucial component of advertising literature (Ajzen, 2002). The common disadvantage of advertising is the speed with which products can be displayed online, which increases the likelihood of deceptive or misleading acts whereby advertisers manipulate a product's features or a promotional strategy to generate large profits at the expense of consumers' financial stability (Riquelme, et al., 2016). Additionally, advertisers can influence customers by

increasing their susceptibility to illogical decisions. False advertising, according to Svetlana (2014), frequently emphasises the product, price, and promotion.

The unethical, deceptive, and misleading advertising practices that influence customers' purchasing decisions are the main topic of this study. This study looks into how customers' internet buying habits are impacted by false advertising. The primary topics of earlier research were customer happiness and service excellence. The impact of false advertising components on consumer purchasing behavior has not received much attention. False advertising is a problem that has gone unnoticed, which calls for more research. Along with examining future purchases based on fulfilment and pleasure, this study will also look into consumers' knowledge of their prior experiences with service providers. The kinds of false advertising strategies that are employed by marketers will also be examined in this study.

2. Literature Review

Online advertising is already a major global communication channel because of technological advancements. Since advertising boosts sales and boosts profits, an advertiser seeks to raise awareness of a company's brand, website, or event. Scholars who have examined advertising generally concur that marketing is an essential instrument for economic expansion (Dwivedi et al., 2021). Advertising companies' exaggerations, however, are complete fabrications. Agencies tend to make promises about products that they can't fulfil, which makes it easy for customers to be duped. Numerous reports have indicated that the majority of shoppers are credulous and easily influenced by the false claims made in advertisements. The cleverness and smug messaging that advertisers produce and present as authentic mislead customers into making purchases (Fastercapital, 2024).

According to recent studies, businesses frequently employ false advertising to capture or grab customers' attention. Repurchases will be restricted as long as these companies keep deceiving or misleading customers with these tactics. The images, cost, features, and quality of the goods or services are the main areas where deceptive advertising is employed; for some goods, it even extends to the product's expiration date. This study looks into whether viewers of commercials that present conflicting information and make exaggerated claims alter their purchasing behavior. The three components of fraudulent advertising practices—deception, misleading information, and unethical advertising—will also be put to the test in this study. The target audience for this research will be tested based on their knowledge, and experience with online shopping followed by their awareness of the methods used.

Consumer Online Purchase Behavior

Consumer purchasing behaviour is the culmination of their decisions, intents, attitudes, and preferences. The consumer is motivated to make a purchase by these four considerations. Online shopping is defined as the act of making purchases of goods or services via the Internet (Khan et al, 2022). There are several ways that the purchasing process resembles typical shopping habits (Tao et al., 2022). An online transaction typically involves five steps. The first one begins with determining what product or service is needed, and then it looks for information online and using search engines. The assessment and comparison of what is on hand and what meets the necessary requirements come next. Following selection of the desired good or service, the buyer completes a transaction and obtains a post-purchase experience (Niosi, 2021).

Rusnifaezah et al. (2022) state that four important mental factor, inspiration, recognition, convictions, and disposition have an impact on a customer's shopping behaviour. It has been discovered that a consumer's personality, demography, and beliefs about the benefits of online buying influence their online purchasing behaviour. According to Raut et al. (2021), perceived behavioural control influences the frequency of a behaviour by serving as a predictor of behavioural intentions. The purpose of a behaviour is also influenced by an individual's attitude towards partaking in it and their perception of its advantages.

False Advertising

False advertising is a type of advertising when the advertiser withholds any and all information regarding a product's features or other specifics in an effort to mislead, confuse, or attract customers. Most countries have laws against using deceptive advertising. It is against the law to misrepresent a product's origin, maker, quality, specs, makeup, price, or maker (Madhavi & Gudlavelleru, 2020). It is said that there are three ways to advertise

deceptively, and it is these ways that shape customer perception globally. The three tactics are fraud, lying, and deception. The common perspectives of elements of advertising communication include the marketer, the message, and the ensuing consumer views regarding a deceptive commercial (Madhavi & Gudlavelleru, 2020).

False advertising, according to contributors like Radoslav (2023), is a competition among marketers. False advertising, according to Madhavi & Gudlavelleru (2020), is the practice of lying, misleading, and disseminating incorrect information. Customers are seen as susceptible when advertisements recommend something to them. False advertising that commit acts of deceitfulness influence a customer's decision. Customers' decisions are impacted because they were unfairly persuaded and misled by the message that advertisements presented, which influences their perceptions (Juana & Stefan, 2023).

Unethical Advertising

The dissemination of cultural values and norms established by rigid, governmental, or legislative establishments where one looks for moral guidance is known as unethical advertising (Manoj & Sahil, 2023). By creating and misrepresenting inaccurate content in a way that harms a competitor's reputation and makes exaggerated claims that have a detrimental impact on people's lives, unethical advertising materially manipulates customers. Viewers are forced to feel uncomfortable and confused when they watch unethical advertisements (Goo et al., 2021). The foundation of unethical advertising is the discrimination and demonization. When someone is treated differently by advertising because of their race, nationality, gender, age, sexual orientation, religion, or political beliefs, it is discrimination against them. It also demonstrates injustice, intolerance, and biological unfairness. Furthermore, unethical advertising denigrates, threatens, stirs up animosity towards, or parodies a person or group of people due to their political ideas, religion, disability, sex, age, race, ethnicity, or nationality (Goo et al., 2021).

Customers are negatively impacted by unethical advertising because it casts a poor image in their minds and manipulates the environment and values. Sociodemographic and cultural variables are used by unethical advertising to affect customers' purchasing decisions (Rodrigues et al., 2021). Consumer perceptions of unethical advertising are significantly influenced by moral principles and values (Goo et al., 2021). According to Vaishnavi (2023), when a consumer is presented with unrealistic expectations of their potential appearance or level of improvement, unethical advertising fosters unfavourable attitudes, moral principles, values, age, gender, and religion. These factors influence the consumer's purchasing behaviour. Unethical advertising is a dangerous and immoral activity that can cause harm to individuals. Advertising shouldn't deceive, hurt, or transgress moral principles. People's opinions of themselves and their surroundings are influenced by advertising. According to Hanan et al. (2022) unethical advertising consists of erroneous ideas that become established in people's thoughts and lead to needless product use. The unethical behaviour of advertisers means that there will always be unethical problems in the advertising industry.

Misleading information

False statements regarding a good or service, such as data characteristics, nuanced data truths, and development recommendations, constitute misleading information (Balakrishnan et al., 2021). Misleading advertising seeks to highlight a commercial as the greatest on the market in order to boost sales. One of the most popular strategies is exaggerating the product; if the exaggeration was minimal or unenthusiastic, the advertisement would not receive the anticipated attention (García-Nieto et al., 2021). The majority of false statements have been distinguished from puffing. Exaggerated statements made for a product depending on the seller's preference or opinion are known as puffing (Rockcontent, 2021). An example of this would be an advertisement that highlights the positive aspects of a health supplement while downplaying its negative aspects (Iye et al., 2021).

Customers become sensitive to all forms of advertising when they see advertisements as deceptive (García-Nieto et al., 2021). According to Moore & Hancock (2022), young folks are more adept than older ones at recognising false information. According to Ravindran (2023), information can be misrepresented orally or in writing in advertising. False advertising can either promote reckless behaviour or inaccurately portray people. According to Estrellado et al. (2021), the complexity of characteristics and the range of reasons why customers make purchases make it extremely challenging to evaluate the effect of misleading advertising on consumer

behaviour. According to Das & Debroy (2022), ads may attempt to mislead two distinct persons at times, but this will only have an impact on one person's purchasing decisions and have no bearing on the other.

Deceptive advertising

The dishonest practice of false statements and impressions made by advertisers to persuade consumers to make a purchase is known as deceptive advertising. The manipulation of prices and hidden costs, the misuse of phrases like "going out of sale" or "free," inadequate or inconsistent comparisons, false colouring, "angel dusting," bait and switch, and no risk acceptance by default are the main features of deceptive marketing (TorHoerman,2022). According to Wang et al. (2022), deception in advertising is a widespread phenomenon that arises from various types of unfulfilled expectations, and deception in advertising only happens when expectations introduced by marketers are not met. According to Chen et al. (2022), only the deception outcome would appear to be subjective when a consumer consumes or experiences the performance of a service or product since different consumers have different expectations. According to TorHoerman (2022), deceptive advertising can be defined by three factors: first, it must involve credible claims that are blatantly false or blatantly obvious; second, it must involve encouragement that differs from what consumers believe the advertisement to be and what is true; and third, it must involve a consumer's held belief that is supported by a prior purchase belief from other advertisements. Customers may suffer when they mistakenly perceive an advertisement to be factual when it is not (García-Nieto et al., 2021).

Gardner (1975) defined deceptive advertising as involving lying as well as creating false assumptions that could influence a customer's behaviour. The way that customers strive to match the product's attributes with the claims made in deceptive advertising and identify any differences is demonstrated by their behaviour (Abd el Baki, 2020). According to Nekmahmud et al. (2022), the perception of deceit has an effect on a consumer's behaviour, intentions to make more purchases, and degree of product loyalty. Abd el Baki (2020) asserts that deceptive advertising results in expenses, social disbelief, and psychological distress for the customer.

Unethical advertising influence on consumer's online purchase behavior

Unethical advertising is the distribution of cultural norms and values by political, religious, or governmental groups to people seeking moral and ethical advice. The production of false ideal information and its dissemination to the public via mass media outlets is unethical advertising. Unethical advertising is designed to harm the reputation of rival brands. It's mainly used to mislead and confuse consumers; unethical advertising makes incorrect or exaggerated claims. Advertisements that use minors, exaggeration, puffery, deceptive brand comparisons, surrogate advertising, and exaggerated claims are examples of unethical advertising practices. They are the type of advertisements that have the consequence of making viewers feel bad (Fazle, 2023).

Hanan et al. (2022) stated that advertisers are releasing more exaggerated claims of their products and services, which might result in companies losing their credibility and their competitive position in the market due to unethical advertising. According to Tyagi (2023), unethical advertising can fall into the category of promoting banned products like alcohol and cigarettes, and advertisements of products that are bad for people's health. Sharma & Bumb (2021) noted that unethical advertisements nowadays' focus on stereotyping gender manipulation and exploitation, advertisements that unrealistically show women and men tend to put pressure on how a person should or would look.

Unethical advertising is criticized for hurting society. Unethical advertising creates a negative thought in the minds of consumers and the creation of manipulation negatively affects the values and environment. Unethical advertising influences consumers buying behavior by using socio-demographic and cultural factors (Wang et al., 2022). Moral principles and values have a significant impact on consumers' attitudes toward unethical advertising (Goo et al., 2021).

Vaishnavi (2023) stated that unethical advertising creates negative attitudes, moral principles, values, age, gender, and religion which affects consumers' buying behavior due to the implementation of what a consumer could look like or how better they can be. Unethical advertising is a destructive and immoral action that may harm people's characteristics. According to Qutp et al. (2018), unethical advertising should not be deceptive, harmful, or in violation of moral principles because it shapes people's perceptions both individually and

collectively. It also creates false beliefs in the minds of consumers and encourages needless product consumption. Furthermore, because of the immoral behavior of advertisers, there will always be unethical issues surrounding advertising.
H1: There is a significant influence of unethical advertising on consumer's online purchase behavior.

Misleading Information Influences on Consumer's Online Purchase Behavior
Misleading information is the exaggeration of an advertisement to improve the benefits of a product created by advertisers (García-Nieto et al.,2021). Misleading information in an advertisement is likely to mislead anyone who sees it. Misleading advertising may affect consumer's choices regarding what they buy. Misleading information in an advertisement that creates or exploits a false belief about the expected outcome of a product. The making of false or misleading claims is deliberately illegal (Nuseir, 2018). Additionally, Nuseir emphasized that consumers react negatively to misleading advertising and grow distrustful of claims made about products they do not fully comprehend. According to García-Nieto et al. (2021), firms can create false claims to enhance the perception of their products and services by making unproven assertions about a product that is difficult to establish or refute.

Bermes (2021) mentioned that false promises and misguided information promote wrong values for the audience and people might get threatened by advertisements in the future. Misleading advertisements encourage irresponsible behavior or irresponsibly represent people. Estrellado et al. (2021) claimed that it is very difficult to assess the impact of misleading advertisements on consumer behavior due to the complexity of features and consumers purchase for a variety of reasons. Greenfield (2018) argued that sometimes advertisements may try to mislead two different people, but this will only affect one's economic behavior while the other economic behavior will change.
H2: There is a significant influence of misleading information on consumer's online purchase behavior.

Deceptive advertising influence on consumer's online purchase behavior
Deceptive advertising is based on the acquisition of false impressions or beliefs created by advertisers (Held, 2018). If an advertisement or advertising campaign leaves a consumer with an impression or belief different from what was promised from a product or service and leaves consumers with the impression of an untrue belief, then deception is said to exist. Deception concerns revolve around unfulfilled expectations or false beliefs advertisers (Held, 2018).

According to Xiang & Song (2020), the determination of deception lies in the consumer's ability to recognize an advertisement that presents a distorted or categorized claim. According to Radoslav (2023), deception happens when a customer thinks that an advertising is deliberately trying to mislead them. Ads that alter product information and incite intended behavioral changes in consumers' decision-making are considered immoral, according to Khan et al. (2020). Advertisement deceptiveness was examined by Garbouj & Saied (2019) as a measure of skepticism that gives consumers the impression that a marketer is in charge of attempting to create false views through any kind of marketing communication.

According to Islam (2021), dishonest advertising involves lying and fosters misconceptions that may have an impact on a customer's behavior. When a customer attempts to reconcile the features of the product and any departures from the claims made in advertising, the consumer's actions are affected by the findings. Yang et al. (2019) claim that a consumer's behavior is influenced by their impression of deception, which also has an impact on their desire to repurchase and level of product loyalty.

Golf-Papez et al. (2022) stated that deceptive advertising leaves financial charges, social disbelief, and emotional distress on the consumer. Iqbal & Siddiqui (2019) researched the effect of deceptive advertising on customers' attitudes, behaviour, and psyche, the research found that deceptive advertising affects the customer attitude towards purchasing. A customer's assessment, purchasing attitude, and purpose may all suffer if their perception and the real experience differ. The degree of real or anticipated harm determines how customers will respond to perceived deceit; this response will manifest itself as a desire to buy and repurchase (Timmerman & Piqueras-Fiszman, 2019).
H3: There is a significant influence of deception on consumer's online purchase behavior.

Research Questions

- How much does unethical advertising influence consumers' decisions to make purchases online?
- How much does consumers' behavior when making purchases online get influenced by false information?
- What impact does deceptive advertising have on consumers' internet buying habits?

Research Objectives

- To ascertain how consumers' online purchasing behavior is impacted by unethical advertising.
- To investigate how deceptive information affects consumers' online buying decisions.
- To look into how lying affects customers' internet buying habits.

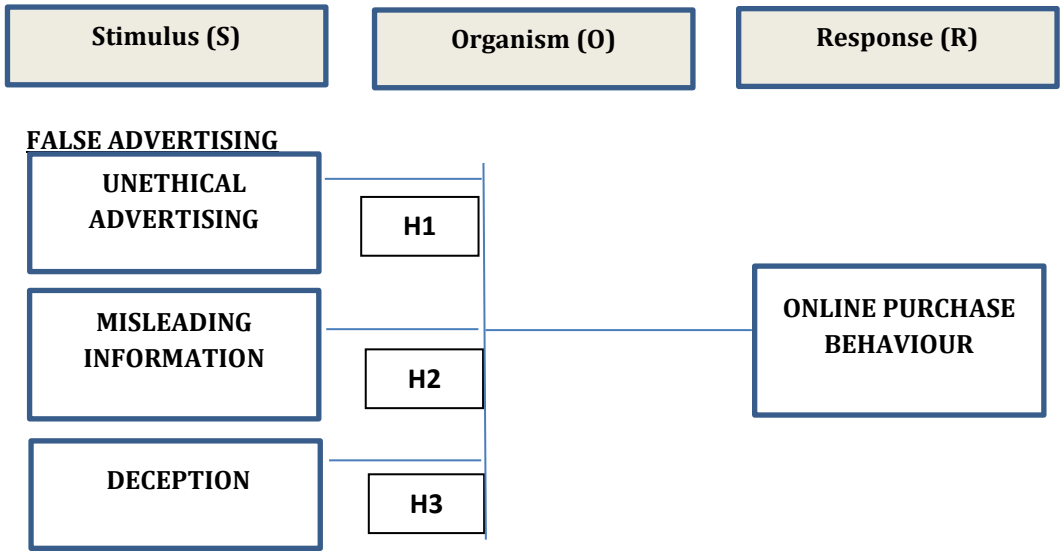
3. Research Methodology

The targeted respondents of this research are consumers who shop online and are between the ages of 21 years old – 60 years old, and consumers who can comprehend the consent form, made a purchase in the last twelve months, and regularly shop through the top five (5) e-marketplaces in Malaysia namely: Shoppee, Lazada, Lelong. my, 11street, and Goshop. As of April 2019, the top five (5) e-marketplaces in Malaysia averaged between seven hundred thousand to twenty million visits daily (Mofokeng, 2021). A total of 588 respondents will be an appropriate sample size for this population as it passes the benchmark of power of analysis by Serdar (2021) on a standard effect size of 384 and within the range of 30 to 500 (Roscoe, 1975). In this research, a correlational design was used to examine the relationship among the variables and a survey method was used for data collection, which involves distributing questionnaires personally online to respondents to collect primary data; the survey was used to collect data from daily customers based on the understanding that these customers hold some knowledge in the online shopping sector. SPSS 26.0 was used to capture the data collected and a total of 17 items were created to examine consumers' online purchase behavior. plot testing was performed beforehand to ensure the reliability and validity of the constructs of the research with a minimum of 0.7 Cronbach Alpha.

Framework

The framework examines false advertising practices, methods, and techniques used to manipulate consumers' emotions toward online purchase behavior This research will investigate the relationship between unethical advertising, misleading information, and deception toward consumers' online purchase behavior.

Figure 1: Stimulus, Organism, and Response Model (SOR) - Russell and Mehrabian, 1977.



The Stimulus-Organism-Response Model (S-O-R) and False Advertising effects on Online Shopping behavior

The S-O-R Model applied to false advertising explains how misleading stimuli (stimulus) can lead to cognitive dissonance and emotional responses (organism), which, in turn, influence consumer behaviors and reactions (response). In both cases, the S-O-R Model helps us understand the complex interactions between external stimuli, internal psychological processes, and observable behavioral responses, shedding light on how online shopping and false advertising are intertwined and how they impact consumer decision-making. On the other hand, when addressing false advertising, stimuli encompass dishonest product claims, misleading images and descriptions, unrealistic promises, deceptive pricing tactics, and manipulative data usage. The organism aspect of false advertising relates to cognitive processes, trust, skepticism, and emotional responses. Consumers evaluate misleading advertisements by comparing them with their existing knowledge and expectations (Xie & Boush, 2011). Trust in advertising claims varies among consumers, influenced by prior experiences and attitudes toward marketing.

False advertising can elicit emotions like frustration, disappointment, and anger if consumers feel deceived. Finally, the response to false advertising may involve consumers making purchases based on false claims and subsequently feeling deceived, eroding trust and loyalty, and potentially leading to complaints or negative word-of-mouth that can impact the brand's reputation and sales (Bhandari & Rodgers, 2011).

4. Results

This section provides information on the respondents who belong to the demographic profiles that had been measured using the set of questionnaires in section A. Section A of the questionnaires consists of 10 questions on gender, age, marital status, race, level of education, profession, salary, shopping frequency, average amount spent online, and preferred online shopping platform. A total of 588 questionnaires were distributed and 588 were collected from the respondents, and all 588 responses were used as they fulfilled the data criteria; no missing values and the questionnaire was answered by the right respondents.

Profile of Respondents: Table 1 displays a summary of the characteristics of the total sample of customers who participated in the study.

Table 1: Demographic and Geographic Information About 588 respondents.

VARIABLE	FREQUENCY	PERCENTAGE
GENDER		
Males	203	34.5%
Females	385	65.5%
Total	**588**	**100%**
AGE		
21-3o	354	60.2%
31-40	155	26.4%
>41	79	13.4%
Total	**588**	**100%**
Marital Status		
Single	388	66%
Married	183	31.1%
Other	17	2.9%
Total	**588**	**100%**
Race		
Malay	266	45.24%
Chinese	232	39.46%
Indian	58	9.86%
Others	32	5.44%
Total	**588**	**100%**
Level of Education		
Secondary School	18	3.06%

Diploma	84	14.28%
Undergraduate	368	62.59%
Postgraduate	114	19.39%
Others	4	0.68%
Total	**588**	**100%**
Profession		
Self-employed	82	13.95%
Unemployed	180	30.61%
Employed in the Public Sector	52	8.84%
Employed in the Private Sector	189	32.14%
Others	85	14.46%
Total	**588**	**100%**
Salary		
Below RM 1,000	230	39%
RM 1,000 – RM 3,000	110	19%
RM 3,001 – RM 5,000	85	8.84%
RM 5,001 – RM 9,000	163	27%
Total	**588**	**100%**
Shopping Frequency		
Daily	45	7.7%
Weekly	145	24.7%
Monthly	342	58.1%
Yearly	56	9.5%
Total	**588**	**100%**
Average Amount Spent Online		
RM 0 – RM 250	316	53.2%
RM 251 – RM 500	160	27.2%
RM 501 – RM 1000	60	10.2%
RM 1001 – RM 2500	23	3.9%
RM 2501 – RM 5000	25	4.5%
RM 5001 and above	4	1%
Total	**588**	**100%**
Preferred Online Shopping Platform		
Shopee	412	70.1%
Lazada	148	25.2%
Zalora	5	0.9%
Lelong. My	14	2.4%
Others	9	1.2%
Total	**588**	**100%**

Descriptive Statistics: The purpose of conducting the mean and standard deviations is to understand the central tendency and dispersion values of the factors

Table 2: Descriptive Statistics

	Descriptive Statistics		
Variable	**Factor Name**	**Mean**	**Std. Dev.**
UA	Unethical Advertising	3.11	1.09
MI	Misleading Information	3.49	0.84
D	Deception	3.31	0.94
OPB	Online Purchase Behavior	5.40	1.50

A descriptive mean analysis was performed on the variables in this study. As presented in the Table above, the results show the mean values and standard deviations of each variable. The mean values range between 3.11

and 5.40 and Standard deviation values range from .84 to 1.50. The highest mean value is for online purchase behavior with a score of 5.40 and the lowest mean value is for unethical advertising with a score of 3.11.

Table 3: Correlation Analysis Table

No.	Variables	Mean	SD	1	2	3	4
1	Unethical advertising	3.11	1.09				
2	Misleading information	3.49	.84	.674**			
3	Deception	3.31	.94	.659**	.789**		
4	Online purchase behavior	5.40	1.50	.642**	.633**	.791**	

**. Correlation is significant at the 0.01 level (1-tailed).

Before conducting a simple or multiple regression analysis on the variables under investigation, it is necessary to establish the association between the independent and dependent variables, as demonstrated by the correlation analysis results between the two variables in the above table. Correlation coefficients between the variables (independent and dependent variables) about online purchasing behavior, deceit, false information, and unethical advertising often fall between .633 and .791. In summary, there exists a spectrum of moderate to high overall correlations between independent and dependent variables.

Table 4: Summary of Variables "Reliability Test

Variables	*Cronbach's Alpha reliability*	*No. of Items*
Unethical Advertising	.666	4
Misleading Information	.792	5
Deception	.856	6
Online purchase behavior	.901	5

By utilizing SPSS reliability analysis, each variable in the questionnaire was tested, and the results ranged from moderate to high. Items measuring unethical advertising (.666) have moderate consistency (< 0.7) whereas items measuring misleading information (0.792), and deception (0.856) have high consistency (> 0.7). Items measuring online purchase behavior (0.901) have very high consistency. The highest reliability is shown for online purchase behavior with a result of above 0.9, which is considered excellent consistency. The table above shows a summary of the reliability test for the variables.

Table 5: ANOVA test results of Independent Variables and Online Purchase Behavior

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	864.438	3	288.146	365.514	.000[b]
	Residual	459.597	583	.788		
	Total	1324.034	586			

a. Dependent Variable: Online_Purchase_Behavior
b. Predictors: (Constant), Deception, Unethical_Advertisement, Misleading_Information

It's time to assess how much each independent variable contributes to explaining the variance in the dependent variable after looking over the regression model's summary. This might be evaluated using the provided coefficients table. Which independent variable helped predict the dependent variable is indicated by the Standardised Coefficient Beta. The dependent variable is better explained by the highest beta values.

Table 6: Coefficient of dependent variable: Online Purchase behavior

Coefficients							
	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1 (Constant)	1.170	.157		7.461	.000		
Unethical_Advertisement	.318	.047	.232	6.731	.000	.503	1.988
Misleading_Information	-.126	.075	-.071	-1.688	.092	.336	2.978
Deception	1.110	.066	.694	16.776	.000	.347	2.878

a. Dependent Variable: Online_Purchase_Behavior

It is necessary to compare the Standardised Coefficient Beta to identify the model's largest contribution. The greatest Beta in this model is 1.110 for deceit, and its t-value is confirmed to be significant. The model indicates that unethical advertising has the second biggest Beta of 0.318, which is also deemed statistically significant. In this model, misleading information has the third-largest Beta (-0.126), although it is not statistically significant.

The unstandardized coefficient for unethical advertising is equal to .318. This means that with each increase in unethical advertising, there will be an increase in online purchase behavior by 31.8%, Followed by the unstandardized coefficient for misleading information is equal to -.126. This means that with each increase in misleading information, there will be a decrease in online purchase behavior by 12.6%. And the last unstandardized coefficient for deception is equal to 1.110. This means that with each increase in deception, there will be an increase in online purchase behavior by 11%.

Discussion

The percentage of respondents that were willing to participate in the research is 98%. Additionally, the majority of the respondents were Malays or Chinese which could be an indication of the ethnic makeup of the area or region from which the sample was drawn. The respondents were mostly young adults with the majority of them being between 21 to 30 years old. The respondents were also predominantly female, with 65.5% of the sample being women. The majority of the respondents held an undergraduate degree and were employed in the private sector. In terms of online shopping habits, most respondents shopped every month and spent between RM 0 – RM 250 on average and Shopee was the most preferred online shopping platform among the respondents. Furthermore, the data suggests that online shopping activity is popular among the respondents, with a significant portion of them shopping every month. Overall, the information provided about the respondents gives us some insight into their demographic and behavioral characteristics, which may help contextualize the findings of the research on the effects of false advertising on consumer's online purchase behavior.

The results show that all the instruments have a satisfactory value of reliability and validity. This chapter also involves hypothesis testing using a series of multiple regression analyses. This study attempted to examine the effect of the three factors in false advertising namely unethical advertising, misleading information, and deception on consumers' online purchase behavior.

5. Managerial Implications and Recommendations

Several potential areas for research on the effects of advertising on the online shopping behavior of Malaysian consumers have been identified based on the information discussed above. It can start with exploring how false advertising impacts consumer trust in e-commerce platforms. Researchers should investigate the extent to which false advertising affects customers' trust in e-commerce platforms and their likelihood of using them again. Evaluating the effectiveness of Malaysia's regulations on advertising. Researchers should analyze the country's framework and enforcement mechanisms related to false advertising to determine how well they protect consumers from deceptive practices and suggest improvements.

Understanding the role of third-party platforms in combating ads, as well as investigating the influences of it. Researchers should explore how third-party platforms like e-marketplaces can mitigate advertising practices

and strategies employed to safeguard consumers. Researchers could examine how well consumer education and awareness efforts they impact shopping habits. Researchers could create suggestive initiatives aimed at educating consumers about misleading advertising practices in Malaysia.

Conclusion

The study's conclusions highlight the critical role that advertising plays in influencing customer perceptions of products and services and driving consumer purchasing behavior. Industry sectors need to plan their advertising strategies in light of the significant influence innovative commercials have on consumers' decision-making processes. Advertisers can consider using a blend of intellectual and emotional appeals to better engage consumers and meet their psychological, emotional, and social requirements. Furthermore, companies in the sector need to recognize that customer attitudes and the excellence of advertising have an indirect impact on consumer decisions when it comes to online advertising.

Businesses can maximize their impact on consumers by optimizing their online advertising strategy by using the clear correlation between purchasing behavior and online marketing. In light of these findings, we advise industry participants to give top priority to creating marketing efforts that appeal to customers' deeper emotional needs in addition to highlighting the practical benefits of products. This all-encompassing method of advertising has the potential to strengthen the bond between consumers and goods, which will ultimately have a favorable impact on their purchasing decisions. Furthermore, ongoing initiatives to improve the distinction of online advertising and conform to changing consumer sentiments will surely lead to more impactful and successful advertising campaigns, which will be advantageous to the market and to consumers in general.

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Islamic Human Resource Management (IHRM) Influence on Employee Turnover Intention in Multi-National Corporations (MNCs) in Malaysia

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Abstract: This paper investigates the dynamics affecting employees' intentions to leave their jobs in multinational corporations (MNCs) in Malaysia, focusing on the influencing factors of Islamic human resource management (IHRM). The increasing trends of employee turnover intention have significant implications for businesses, as they can impact strategic objectives and plans. The consequences encompass higher expenses, elevated costs for hiring and replacing employees, the need for time-consuming training, disruptions in productivity and supply, and a decrease in morale. To investigate this phenomenon, a positivist research design with a correlational study approach was adopted. The study population consisted of diversified MNCs, with a sample of 277 MNC employees as the unit of analysis. Questionnaires were used as the research instrument. The findings revealed a strong relationship between Islamic recruitment and hiring and employee turnover intention, and between Islamic performance and compensation and employee turnover intention. This study highlights the importance of integrating Islamic human resource management into organizational practices, identifying specific management strategies that can help mitigate and address employee turnover intention.

Keywords: *Behavior, Employee Turnover Intention, Trends, Islamic Human Resources Management (IHRM), Multi-National Corporations*

1. Introduction

A voluntary termination from an employee in their employment contract typically starts with an intention to leave the organization (Ahmad, 2008). When an employee quits, the impact it poses to the organization includes high recruitment or replacement costs, reduction in profitability and productivity of the organization, drop in morale in the remaining employees and employee performance and stability are highly affected (Guest, 1997; Winne et al., 2019).

Customarily the human resource management (HRM) practice assists organizations in their business and people. Nevertheless, the practices of HRM also contribute to and affect employee's intention to leave the organization (Ahmad, 2008; Cho & Lewis, 2012; Jeon & Yom, 2014; Oliveira & Rocha, 2017). Ahmad (2008), Cho and Lewis (2012), Jeon and Yom (2014) and Oliveira and Rocha (2017) also linked the behavior of employee turnover intention with the practice of HRM in the organization.

Guest (1997) and Winne et al. (2019) confirmed and supported that studying employee turnover intention can also assist in predicting actual turnover. Due to the found literature, this research is deemed paramount.

Most organizations worldwide practice or exercise conventional human resource management (CHRM). CHRM generally focuses on quantitative, material-based, and mostly measurable approaches to reward compensation. CHRM also promotes equal recruiting opportunities, equitable pay, gender-neutral employment terms, women's rights and opportunities, and fair compensation on performance reviews (Çelik, 2018; Hussain & See, 2019; Ivanovic & Ivancevic, 2018). Despite these, CHRM is not without flaws. Some literature observed there are limitations in practice, such as insufficient compensation, lack of communication, corporate office politics, and difficulties in adapting to one organizational culture (Chakrabarti & Guha, 2016; Michaels & Spector, 1982).

Another HRM practice that is slowly emerging and accepted in the industries is known as Islamic human resource management (IHRM). IHRM regards employees as more than mere labor and is distinguished by its adherence to ethical values, self-confidence, and motivation. IHRM is an HRM practice that incorporates Islamic principles derived from the Al-Quran and the teachings and practices of the Prophet Muhammad S.A.W. called Sunnah. These Islamic values have been upheld since 632 CE (Azmi, 2015; Hadjri et al., 2019; Norton, 2011). IHRM was found to be significant as it is related to HRM practices. It was found that IHRM reduces behavioral

intentions, including employee turnover intention, in ASEAN countries such as Indonesia and Malaysia (Azmi, 2015; Hadjri et al., 2019). IHRM was also observed to benefit non-Muslims and is applicable and capable of being extended to any individual regardless of religion (Khan et al., 2010). Nevertheless, IHRM is not without limitations. Based on a study conducted by Rokhman (2010), Islamic work ethics (IWE) had no impact on the intention of 49 employees from 10 Islamic microfinance institutions in Java to leave their jobs.

The mixed findings in the existing literature highlight the need for further analysis to determine whether IHRM can effectively mitigate employee turnover intention in multinational corporations (MNCs) in Malaysia.

The paragraph below further introduces the factors IHRM contributes to employee turnover intention. It also examines the theories and connections between these factors, which serves as the basis for creating a framework for this research.

2. Literature Review

Employee Turnover Intention: refers to the behavioural indication that an employee intends to leave a company. This is evident through a decrease in their commitment, which eventually leads to resignation, indicating the actual intention to turnover (Ahmad, 2008).

Employees have different reasons for quitting their jobs, which can be categorized as either external or internal motivations. In some cases, it may be a combination of both. External motivation is often associated with factors related to spirituality and financial aspects, while internal motivation is influenced by emotional perception.

The literature offers various explanations for this behavior, including factors such as inadequate compensation packages, the desire for a prestigious company title, career milestone goals, communication issues within the organization, corporate politics, and difficulties in adapting to the company's culture (Chakrabarti & Guha, 2016; Michaels & Spector, 1982). In the next section, relevant theories of turnover intention will be discussed to provide further clarity on the phenomenon and identify potential triggers for this behavior.

Underpinning Theories: The Guest Model, proposed by Guest (1997), suggests implementing the right type of HRM practice towards excellent outcomes for the organization. The Guest Model consists of six dimensions, there are HRM strategy, HRM practices, HRM results, behavior results, performance results, and financial results. These dimensions are used to analyze the impact of HRM practices on performance outcomes, which are significant factors in the organization's objective. One of the dimensions is the performance result dimension which explains how poor performance affects the organization, often, it always affects the labor or employee turnover.

Islamic Human Resource Management (IHRM) Practice and Employee Turnover Intention: Azmi (2015), Balla et al. (2016), Dhar et al. (2017) and Hashim (2009) were used to derive the independent variables in the study framework. The literature shared focused on the influential factors that IHRM had on improving employees' knowledge, performance, trust, commitment, and loyalty which in turn put a halt on employee turnover intention.

To enhance organizational commitment and reduce turnover intention, Balla et al. (2016) proposed a simplified model that emphasizes the importance of HRM practices. Dhar et al. (2017) also recognized the significance of HRM practices, which impact organizational performance, employee commitment, loyalty, and turnover intention. The connection between being attentive and comprehending Islamic principles and practices in recruitment and selection, training and development, and rewards systems and trust is noteworthy. However, no significant relationship was found between trust and Islamic performance appraisal (Rahman et al., 2013). On the other hand, Rokhman (2010) revealed that Islamic work ethics have positive effects on job satisfaction and organizational commitment, but no significant relationship was found between Islamic work ethics and turnover intention.

A study on 128 employees at Resalat Qard Al-Hasan Bank in Tehran, found the practices of Islamic Human Resources Management (IHRM) such as recruitment, selection, training and development, and remuneration

and compensation have a direct correlation with organizational justice. However, no significant relationship was found in the IHRM practice of performance appraisal due to employees' negative attitudes toward their regular job functions (Fesharaki & Sehhat, 2018).

Considering the contradictory results and some insignificant relationships found in previous studies, further analysis is needed to verify and support the influencing factors of IHRM practices. Hence, these practices have been selected as the independent variables in this study. The IHRM practices identified in this study are based on the research conducted by Azmi (2015), Hashim (2009), Rahman et al. (2013), Sadeq (2018), and Alkahtani (2014). Three human resource elements have been identified as having a significant impact on reducing employee turnover intention. These elements have been chosen to represent the independent variables in the framework.

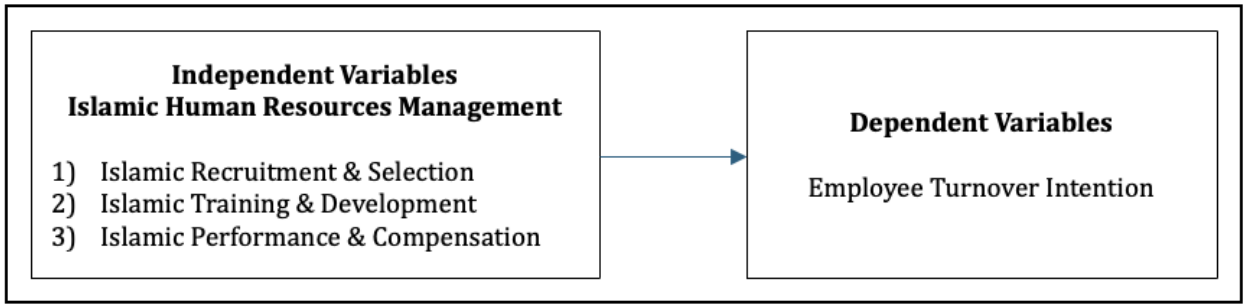
In this paper, the independent variables are based on Islamic principles. These variables include recruitment and selection, which comprise Ifa Al-Aqd (fulfilling the contract) and Huquq Al-Ibad (people's rights), as well as Al-Adl (justice and fairness) which upholds the respect for employees' rights. Within training and development, Itqan (quality and perfection) encourages continuous improvement and knowledge retention (Hossin et al., 2020). In performance, Al-Adl (justice and fairness) and Huquq Al-Ibad (people's rights) are crucial for impartial treatment and respecting employees' rights across the organization, leading to organizational commitment (Sadeq, 2018). Lastly, in compensation, Al-Ukhuwwah and Al-Ihsan (brotherhood and benevolence), Al-Adl (justice and fairness), Huquq Al-Ibad (people's rights), and Al-Ujrah (compensation) promote fair remuneration and empathy based on employees' contribution and hard work, resulting in increased job satisfaction (Sadeq, 2018).

The preceding discussion forms the foundation for developing the framework in the following section.

The Framework: is developed by translating assumptions, expectations, beliefs, theories, and concepts into a comprehensive framework that supports the research (Maxwell, 2012). Based on the literature review, a framework is presented in Figure 1. The hypothesis is that IHRM practices have a predictive role in employee turnover intention. The following hypotheses are emphasized, building on the earlier discussions.

H1: Islamic recruitment and selection have a significant influence on employee turnover intention.
H2: Islamic training and development has a significant influence on employee turnover intention.
H3: Islamic performance and compensation have a significant influence on employee turnover intention.

Figure 1: Study Framework



3. Research Methodology

A lack of research was observed on the IHRM practices in MNCs in Malaysia. This study aims to investigate the implementation of IHRM practices in MNCs as a strategy to decrease the probability of employee turnover. The article specifically examines the employee' intentions and whether they have any intentions to leave their current jobs if IHRM practices are implemented in the organization. The study utilizes a quantitative research methodology, employing the positivist research paradigm and correlational analysis. Questionnaires are used as the data collection tool, and the data is analyzed using SPSS 26.0 to identify patterns.

4. Results

MNCs have garnered considerable attention from researchers and have been a preferred sampling frame for previous studies conducted by Salahudin et al. (2016) and Turnbull et al. (2016), and others with similar objectives. Therefore, the selected MNCs form the population for this study.

MNCs have been acknowledged as a crucial organizational type to study when examining staff turnover. These organizations offer numerous advantages to both the industry and Malaysia. These benefits include: (1) making a substantial contribution to Malaysia's principal tax revenue, (2) serving as a platform to put Malaysia on the world map for foreign investors worldwide, and (3) generating work opportunities.

Profile of Respondents: Table 1 displays a summary of the characteristics of the total sample of respondents or employees of MNCs who participated in the study

Table 1: Demographic and Geographic Information on the respondents of the study

VARIABLE	DESCRIPTION	FREQUENCY	%
Gender	Female	164	59.0
	Male	113	41.0
Generations/Year Born	Baby Boomer	4	1.0
	Gen X	101	37.0
	Gen Y (Millennials)	151	54.0
	Gen Z (iGeneration)	21	8.0
Ethnicity	Malay	160	57.0
	Chinese	72	26.0
	Indian	28	10.0
	Indigenous	1	1.0
	Caucasian	7	3.0
	Others	9	3.0
Religion	Islam	162	58.0
	Buddhist	54	20.0
	Hindu	26	9.0
	Christian	31	11.0
	Atheist	3	1.0
	Others	1	1.0
Highest Qualification	High School	15	5.0
	Tech/Certificate	28	10.0
	Associates/College/Degree	160	58.0
	Masters	67	24.0
	Doctorate	7	3.0
Position Ranks	Non-Executive	0	0
	Executive	110	40.0
	Manager	160	58.0
	Director	7	2.0
Department	Human Resource	72	26.0
	Account & Finance	27	10.0
	Purchasing/Procurement	10	4.0
	Sales & Marketing	29	11.0
	Production	12	4.0
	Customer Service	15	5.0
	Logistic & Warehouse	12	4.0
	Research & Development	15	4.0
	Technical & Engineering	43	16.0
	Board of Directors	5	2.0
	General Administration	29	11.0

	Apparel & Fashion	5	2.0
	Others	3	1.0
Length of Service	1 to 2 Years	29	11.0
	2 to 4 Years	38	14.0
	4 to 6 Years	54	20.0
	6 to 8 Years	41	14.0
	8 to 10 Years	38	14.0
	10 Years and Above	77	27.0
Organization's Industry	Real Estate	2	1.0
	Architecture	4	1.0
	Automotive	15	5.0
	Consultancy	23	8.0
	Data Analytics	7	3.0
	Energy	2	1.0
	Financial Institutions	32	12.0
	Food & Beverages	12	4.0
	Insurance	9	3.0
	IT Services	16	6.0
	IT Solutions	5	2.0
	Jewellery	4	1.0
	Oil & Gas	23	8.0
	Pharmaceutical	17	6.0
	Manufacturing	26	9.0
	Subsea	2	1.0
	Aerospace	13	5.0
	Telecommunication	2	2.0
	Hospitality	6	2.0
	Healthcare	4	1.0
	Constructions	31	11.0
	Others	22	8.0
Origins/Headquarter	North America	55	20.0
	Europe	77	28.0
	The Middle East	8	3.0
	Asia Pacific	137	49.0

In this study, the survey includes both dependent and independent factors. These factors were derived from previous research. To assess reliability, a Cronbach's Alpha coefficient test was conducted. Ensuring the validity and reliability of the items is essential to confirm that the surveys are clear and accurately measure the intended topics.

Questionnaires were used as opposed to conducting in-person interviews. Anonymity disclosures were also practiced as advised on data collection procedures by Salkind (Salkind, 2007).

The data collection process involved MNCs from various industries, such as aerospace and drones, consulting, data analytics, food and beverage, IT services, IT solutions, manufacturing and semiconductor, oil, gas, and energy, among others. A total of 22 diverse industries participated in the survey, with a sample size of 277. The demographic details of the respondents can be found in Table 1.

Reliability of Data: Reliability analysis was conducted by computing Cronbach's Alpha for each measure. Table 2 presented the Cronbach Alphas for independent variables Islamic recruitment and selection, Islamic training, and development, and Islamic performance and compensation in the range of 0.883, 0.887, and 0.861 respectively. The lowest Alpha was 0.861 (Islamic performance and compensation) and the highest Alpha was 0.887 (Islamic training and development). Table 2 showcased the findings in the factor analysis that reported the Cronbach Alpha coefficient being close to 1.0 displaying an internal consistency of the items in the scale.

Table 2: Cronbach's Alpha scores for influencing factors and employee turnover intention

SCALES	NO. OF SCALE ITEMS	RELIABILITY COEFFICIENT (ALPHA) (N=277)
INFLUENCING FACTORS	16	0.913
Islamic recruitment and	6	0.883
Islamic training and development	4	0.887
Islamic performance and compensation	6	0.861
DEPENDENT VARIABLE		
Employee turnover intention	2	0.941

Correlational and Reliability Analysis: The results of correlation analysis are shown in Table 3, indicating that all variables are highly correlated with each other. To explain the influencing factors, the highly correlated variables with an indication of significant relationships among them are considered.

All influencing factors are significantly correlated with each other with the lowest correlation between Islamic performance and compensation ($r=0.473$, $\rho<0.01$) and the highest correlation between Islamic performance and compensation and Islamic recruitment and selection ($r=0.567$, $\rho<0.01$). These significant values indicate the convergent validity of the measures.

Table 3:Results of correlational and reliability analysis

NO	VARIABLES	MEAN	SD	1	2	3
1	Islamic recruitment & selection	3.82	0.72	(0.883)		
2	Islamic training & development	3.83	0.84	0.501**	(0.887)	
3	Islamic performance & compensation	3.12	0.84	0.567**	0.473**	(0.861)
4	Employee turnover intention	3.79	1.77	-0.282**	-0.115	-0.335**

Notes: *significant at 0.05 level; ** significant at 0.01 level; Cronbach's Alpha values are shown in the parentheses

Analysis of Variance ANOVA: Standardized Coefficient Beta shows which of the independent variables contributed to the prediction of the dependent variable. Table 4 displays regression model is significant with an F value of 13.924.

Table 4: ANOVA test results on Independent Variables and Employee Turnover Intention

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	114.377	3	38.126	13.924	.000[b]
	Residual	747.518	273	2.738		
	Total	861.895	276			

a. Dependent Variable: Employee Turnover Intention
b. Predictors: (Constant), Islamic Performance & Compensation, Islamic Training & Development, Islamic Recruitment & Selection

Coefficient of Dependent Variables: Table 5 shares the coefficient of dependent variables and the influencing factors. Islamic performance and compensation ($\beta=-0.288$; $\rho<0.01$) with the largest Beta in the model and its t-value is confirmed significant with an inverse relationship with employee turnover intention. Islamic recruitment and selection are second at ($\beta=-0.173$; $\rho<0.01$) and are significant with an inverse relationship with turnover intention as well.

Table 5: Coefficient of dependent variable: Employee Turnover Intention

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	6.428	.582		11.040	.000		
	Islamic Recruitment & Selection	-.426	.178	-.173	-2.398	.017	.609	1.643
	Islamic Training & Development	.228	.143	.108	1.597	.112	.696	1.437
	Islamic Performance & Compensation	-.604	.149	-.288	-4.051	.000	.631	1.586

a. Dependent Variable: Employee Turnover Intention

Discussion

The study aimed to examine the relationship between IHRM practices and employee turnover intentions in MNCs. The findings reveal that Islamic recruitment and selection as well as Islamic performance and compensation, significantly impact turnover intentions. However, Islamic training and development did not show a significant influence on turnover intentions. The study suggests that implementing these practices can help reduce turnover intentions, while neglecting them may increase turnover intentions. In other words, it would be beneficial for the MNCs to focus on the way the recruitment and selection process is being processed and the way the contract is being laid out. Employees should be given a fair amount of work according to the contract and the remuneration should also coincide with the amount of work rendered to the employer. Subsequently, the performance and compensation rewards should also be fair, filled with humanity, and empathy, and according to human rights.

5. Managerial Implications and Recommendations

Employee turnover intention significantly impacts organizations, particularly MNCs. This study's findings offer valuable insights for MNCs, emphasizing the importance of identifying effective HRM practices or adopting a hybrid approach that integrates conventional and Islamic principles. The empirical evidence underscores the need for heightened focus on these elements within the HRM framework to effectively address employee turnover intentions. Moreover, the results suggest that MNCs operating in Malaysia, where the workforce is predominantly Muslim, should consider incorporating more Islamic-centric elements into their practices. Aligning IHRM practices with the cultural and religious context of the local workforce can enhance employee satisfaction and ultimately reduce turnover intentions. By integrating IHRM practices that resonate with employees' cultural and religious values, organizations can foster a supportive working environment, increasing employee satisfaction and reducing the likelihood of turnover. Additionally, the incorporation of Islamic principles, which emphasize fairness, people's rights, righteousness, and empathy, can build trust among non-Muslim employees toward their employer.

Conclusion

This study investigates the impact of various IHRM practices on employee turnover intentions. The research emphasizes the importance of addressing employees' desire to leave and suggests that IHRM can effectively mitigate this behavior. However, the study notes certain limitations, such as the need for a larger sample size to enhance the validity and robustness of the findings. Despite these limitations, the research provides valuable insights into the realities of IHRM, especially in the areas of employee recruitment, selection, performance, and compensation. The study recommends that MNCs reconsider certain IHRM policies, such as talent exercises, and highlights the benefits of aligning these practices with Islamic principles to improve talent selection and reduce turnover intentions.

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Developing a Model for Graduate Employability Transfer of Training

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Abstract: The focus of this research at the Talent Enhancement Institution (TEI) is to enhance the effectiveness of transfer of training in Malaysia's graduate employability programs. This is crucial for shaping the future workforce in accordance with the Malaysian National Higher Education Strategic Plan 2021–2030 policies and the sustainable development goals for quality education. This study provides insight into the influence of trainees' self-efficacy, traits, and training design on the effectiveness of training outcome transformation. Meanwhile, learning culture acts as a moderator between every independent variable and the transfer of training. Using a practical combination of both quantitative input from 125 survey participants and qualitative insights from 25 interviews, our study seeks not only to investigate but also to gain a detailed understanding of the dynamics of knowledge and skill application after training. We will propose solutions to enhance the transfer of training and improve the effectiveness of Talent Enhancement Institution (TEI) programs in enhancing graduate employability in the dynamic global job market.

Keywords: *Talent Enhancement Institute (TEl), Graduate Employability, Transfer of Training, Training Effectiveness, Learning Culture*

1. Introduction and Background

The difficulty of graduates finding work is a significant roadblock while researching the Malaysian labor market. The widening disparity between graduate skill sets and industry demands, along with rising levels of competition for jobs, makes this problem more challenging to solve (Okolie et al., 2020). As the Ministry of Higher Education Malaysia highlighted in 2021, the progressively intricate benchmarks set by the job market are intensifying rivalry for positions and underscoring the acute lack of jobs. Graduates should be encouraged to have versatile, entrepreneurial characteristics and academic strength, according to the Ministry. New challenges, such as significant unemployment among fresh graduates, can be met with these skills. The country's Ministry of Higher Education has developed a comprehensive strategy to help graduates stand out in Malaysia's competitive job market and reduce the skills gap.

According to Pai and Mayya (2022) research, it is confirmed that Malaysian graduates highly prioritize soft talents, such as proficient English language abilities, computer technology, etc. According to the World Economic Forum (2020), there is an increasing recognition and value placed on soft talents. Graduates universally seek these talents in the perfect workforce. To ascertain the challenges faced by graduates in securing employment in Malaysia, a comprehensive analysis of graduates' requirements is required. This provides a transparent depiction of the expectations held by Malaysian graduates. This endeavor goes beyond the mere provision of facts. Additionally, it offers a strategy to align education with the specific demands of Malaysia's labor market,thereby bridging the disparity between the skills possessed by graduates and the requirements of graduates.

In 2023, linguistic barriers will continue to be significant in Malaysia's work market (Lee, 2023). They have a subtle influence on job performance. Despite the Malaysian workforce's improvements in English proficiency and conversation abilities, hurdles persist. Although the English proficiency and conversational skills of the Malaysian workforce have improved, significant barriers persist, particularly in the application of these skills in workplace communication. According to a study conducted by Hongal and Kinange (2020), individuals with strong language skills have a competitive advantage when searching for employment. Therefore, it is crucial to overcome these challenges and acquire proficiency in multiple languages. The report indicates that Malaysia's training and education systems require enhancements. The objective is to produce graduates who possess the skills necessary to effectively manage the changing communication requirements of the dynamic labor market.

In essence, job prerequisites are undergoing changes because of rapid technological breakthroughs and a growing demand for digital skills, both of which are shaping the current work environment. According to Goulart et al.(2022), possessing digital expertise is crucial for anyone seeking employment. However, the dynamic nature of the employment market might be a challenge for recent graduates who lack technological expertise. Malaysia today faces a discrepancy between its technological advancements and language proficiency. Therefore, we strongly encourage our government and schools to work together, specifically targeting language obstacles and limited technological proficiency. These endeavors aim to transparently outline the expectations for Malaysian graduates, it seeks to do more than simply present factual information or depict current conditions. The objective extends to helping forge comprehension of a specific issue or circumstance by illuminating it. In doing so, recommendations are posited for approaches to narrow the disparity between what is taught and what the job market necessitates. By examining these strategies based on available data and facts, education can be redirected to better meet employment needs.

In 2024, the Ministry of Education will conduct research to improve the employability of graduates. In 2024, the Ministry of Education will conduct research to improve the employability of graduates. This research will guide policy and support initiatives such as the Talent Enhancement Institute (TEI). Aligned with the United Nations Sustainable Development Goals and Malaysia's Higher Education Plan 2021-2030, the plan emphasizes the need to upgrade training and education so that graduates are equipped with relevant job skills and ready for the future. It emphasizes the importance of effectively applying what is learned, not just linking theory with practical skills. This reduces the amount of time it takes for new graduates to bring positive benefits to the company. Today's highly developed and competitive job market makes adaptability more important than ever for graduates. In this way, graduates can become fast learners, quickly acquire competencies and knowledge, and conveniently achieve career goals.

2. Underpinning Theories

Social Cognition Theory: This theory provides a framework to grasp the complex relationship between personal quality, the environment, and other necessary factors. Essentially, it thinks that external influence, such as the results of behaviors, plays a significant role in men's thinking and decision-making process. This has been supported by the research of Stajkovic and Luthans (1998) and Schunk and DiBenedetto (2016), in which a concept called self-efficacy is highlighted. This concept is about self-confidence about the ability of oneself, which is necessary for finishing difficult tasks, overcoming challenges, and achieving long-term goals. This research not only reclaims the value of the social cognition theory but provides scientific support for education and personal development as well - a quite distinct example of the potentiality of this theory to drive achievement motivation and improve learning outcomes.

So, self-efficacy is extremely important for learning. Learners' belief in their capabilities can greatly impact their acquisition of new skills (Dunlap, 2005). Schunk and Usher (2011) noticed that a strong sense of self-efficacy is closely related to an efficient learning atmosphere. It motivates curiosity, sets goals, and allows strategic studying. Consequently, educators and instructors must take responsibility for boosting learners' confidence and self-efficacy. Tasks should be both demanding and achievable, accomplishments should be disseminated, and a nurturing educational environment is essential. According to Renta-Davids et al. (2014), these kinds of targeted interventions can increase self-efficacy, which in turn improves the ability to put training into practice at work. To ensure that learning goes beyond theory and manifests itself in people's competence and confidencein their professional pursuits, SCT offers a useful lens for evaluating and optimizing training programs, thanks to its emphasis on self-efficacy.

Agility Theory: The concept of agility theory originated from its military applications in the 1950s (Richards, 1996). Presently, this is a significant business transaction that prioritizes the requirements of the customers. Agile manufacturing emerged in the early 1990s and revolutionized the manufacturing industry (Hormozi, 2001). According to Muduli (2013), an agile team combines effective communication, client comprehension, expertise, and exceptional service. This notion is revolutionizing the field of human resource management by introducing a novel approach to team management. The agile method is characterized by rapid changes, high speed, extensive knowledge, effective teamwork, and constant pursuit of new ideas. The primary focus is on providing clients with unparalleled value (Qin & Nembhard, 2015). This comprehensive approach signifies a

shift in the conduct of the firm. An active team should anticipate the needs of the customer and act before the customer has even given the order. This can significantly improve customer satisfaction, as well as the efficiency of the entire team.

Felipe spoke in 2016 about how, according to Nafei's research, agility means having the ability to handle tough situations. The rapid development of the world challenges the ability of schools and organizations to respond to unexpected problems. Understanding agile theory helps a lot - it helps us adapt to our environment smartly and be open to new scenarios and ideas. According to Hilton and Pellegrino (2012), this approach significantly improves graduates' ability to apply what they have learned in their lives. Gupta said in 2013 that the curriculum is supposed to develop students' ability to solve real-world problems, which is important for their future business activities. Saha et al. (2017) also saw a few years later that simplifying concepts, providing clear guidance and tools, emphasizing flexibility and rapid response to more effectively manage change, develop, and teach the necessary skills are all requirements of Agile theory. This holistic approach combines several key aspects that highlight the adaptability required today. These new skills or ideas are aligned with the values, goals, and needs of an individual or organization and can be applied in practice. They can help graduates apply classroom learning outside of school.

Today's business environment is full of unpredictable and constantly changing factors. Agile methods are tools that help organizations adapt to changing environments as they evolve. Both the enterprise and the employee should find proper strategies to deal with such uncertainty. During this process, the team leader plays a very central role. The method of agility provides us with a response strategy, encouraging us to rapidly adapt to the continuously changing environment, and training the staff that can handle such challenges. The trainers can help companies with such problems. To facilitate the perfect incorporation of theoretical knowledge and practice, the organization should form a strategic vision, adapting the change by providing each employee with personalized, personality-respecting training. During the past ten years, companies have always been searching for a path that can guarantee continuous success without damaging their competitiveness. Speaking more specifically, the core mission of the trainer, the coach, is to build the adaptability of the trainees and to make sure everyone has been prepared for potential difficulties. Agility is a new sense of intelligence; it considers the development and progress of the individuals and is capable of adapting to the changing business environment while satisfying the current requirements. By reorganizing and redesigning the management procedures, it can achieve rapid and flexible responses. Though the agility and self-adaptive methods provide us with a theoretical basis, their key advantage is the high flexibility, which is recognized and practiced among the whole organization, resulting in a happy outcome in which each member's adaptability and changeability are growing higher when facing challenges.

Adult Learning Theory: In 2011, Belanger tried to expand Knowles' adult education theory, emphasizing customizing instruction, which can better fit the features of mature learners, and endorsed a graduate-level style of teaching. Based on Maslow's famous conclusion about human motivation and well-being, he proposed that adult education should specifically focus on the attractivity of the topic so that this learning might be helpful to add to meaningful matters in their personal and career life (Jarvis, 2004). Additionally, this theory stressed the importance of educators rethinking and adapting their teaching approaches to actively engage and inspire change in adult learning. The core focus involved addressing adult learners' unique needs. It encouraged creative instructional design that could spark and foster adult learning, thereby enhancing the dynamism and transformative impact of the learning process.

While there has always been at least an implicit understanding that adults can and do learn, it was not until the 20th century that research began to focus on adult learning. The earliest studies of adult learning were conducted by behavioral psychologists in the first decades of the century. There are three main schools of adult learning theory - adult learning science, self-directed learning, and transformational learning. Scholars such as Burns (2020), Merriam & Bierema (2013), and Rothwell (2020) have emphasized the application of adult learning theories to modern education, particularly in the provision of graduate training. Adult Learning Theory is well suited to graduate training as it provides a strong basis for tailoring programs to individual needs. As noted by Fung et al (2022), training programs should meet the needs of supervisors while ensuring a safe and inclusive environment to effectively support the growth of adult learners. Avis and his coworker mentioned that the adult learning theory could help relate the training content and works, that is, to nurture

skills by exploring, reflecting, and dealing with reality.

Adult learning theory laid a considerable foundation for our training program and shall benefit the participants to fully understand and utilize the acquired knowledge. Through several important elements, we can witness how this theory plays its role in developing students' abilities and resilience. First, there can be engaging learning activities guided by this theory, in which we practice and discuss in groups our experience, creating opportunities to engage. Second, the career planning assistance in line with this adult learning theory, involves building more specific career counseling to inspire clearer self-awareness of their future paths. Additionally, the adult learning theory emphasizes that there should be a stimulating learning environment, which can benefit individuals and organizations to refine and expand their abilities. It committed that the adults could learn the best during the material that is highly related to reality. It also involves customizing courses according to the demand and interest of each person, achieving their needs. Though this framework has shown its effectiveness in many relevant fields, it shall still be investigated carefully, to better understand how to help the learners in various milieu and occasions. This will allow adult learning theory to better function and help each learner in their path of growth.

3. Literature Review

Talent Enhancement Institution (TEI)

Malaysia Talent Enhancement Institute (TEl) is a talent enhancement practice in Malaysia containing a combination of efforts from institutions and industrial enterprises, and specialized programs for instance HRD Corp (Human Resources Development Corporation), Industrial Training Institutes (ITIs), Advanced Technology and Training Centre (ADTEC), and others. While trying to absorb, develop, and retain the skillful, the TEI is attempting to adapt to the challenges through a series of approaches. It provides the relevant industry training, building methods to deal with the talented workers' shortfall, minimizes the skill gap between the new and the old, and reasonably educates the locals for a sustainable high-skill, innovative, and flexible worker storage for Malaysia's successful transition into a digital economy.

TEl's curriculum provides a wide range of opportunities aimed at cultivating the skill sets necessary for today's careers and tomorrow's advancements. Their proficiency-based teaching model ensures graduates are well-equipped for achievement in the workplace. Employers consider programs and certifications as an indication of experience. Manufacturing techniques, information and communication technology, solar photovoltaic systems, micro-systems, and aerospace could be involved in the curriculum. The students of this course could have chances to obtain the basic ability that is compatible with the requirement of all career options, while deeply understanding the concept of industry 4.0 and smart factories. TEL is eligible to prove that its participants have passed a specific series of courses and training and have acquired the key ability the course offers. This standard method has been highly recognized by various industries - different options fit the same different interests, but the skills and abilities are more general.

Workforce Agility

Labor agility is super-crucial for handling the rapidly changing business environment. As discussed by Miceli et al. (2021), this sense of agility is the key factor for a company to continue running in the market, because it allows the company to promptly adapt to the new situations. According to Armanious and Padgett (2021), this concept of agility exceeds the traditional limitations, and has already been embedded into the spirits and workings of the staff, becoming an internal behavior or 'culture'. They describe it as a guarantee of continuous learning, an unlimited group spirit to adapt and to move forward. Speaking in general, these three aspects form a strong basis so that agility could hold a labor team that can survive and even further develop in this unpredictable era.

Salmen and Festing (2022) studied how agility defines a desirable adaptive employee. An adaptive person has the capacity to learn new skills to cope with the unpredictively and thus adapt to the new environment. Salmen and Festing further discusses the definition of an adaptive employee, connecting this ability to adapt to changes with another, more crucial ability to lead a revolution in a continuously changing business environment. They claim that leaders shall nurture their ability to adapt to the changes, which provides them enough power to guide the team through times of change and toughness, to better recover from the challenges and failures and

more effectively grasp the opportunity of revolution, which is extremely important for the development and surviving of an organization. Prieto and Talukder emphasized in 2023 the key function of adaptability, especially during the global COVID-19 pandemic. Their analysis concludes that this notion of adaptability is an advantage for the organization to better respond to the rapid change of the demand, and transition seamlessly to remote employment models. Thus, these two studies underscore the importance of flexibility and adaptability for employees and organizations navigating a rapidly transforming global business environment.

Contemporary Model and Transfer of Training

In 2020 Williams launched a program to study how previous working experience can help to enhance the strategy of the whole company. He suggests updating the outdated teaching technics, combining the teaching tool and content with the cooperation and enterprise goals. He emphasizes the utilization of technology to continuously for better innovation and improvement. This approach aims at tightly connecting the acquittance of knowledge and development of skills with the prosperity of the company, ensuring that the acquired skills and information smoothly fit with the ordinary duty of staff so that they can more effectively do their jobs and achieve long-term goals. The research shows that the staff using their learned experience and skills can considerably improve the overall operation of the company. It strengthens teams by bringing expert knowledge together with clear goals.

Jones and Smith (2022) suggested a new teaching technique that they believed could help graduates deal with future job hurdles. Their method boosted effectiveness by understanding each learner's needs and teaching in a way that suits them. They aimed to increase self-confidence and the quality of learning by using customized teaching materials. Further, in 2021, Kim and his team showed how support from friends, bosses, and directors can improve learning results. They stressed that a helpful environment boosts success. Also, in 2017, Attiq's team showed the importance of a supportive learning atmosphere. It helped in applying knowledge, preparing for careers, and encouraging continuous learning and applying skills. These research results show that personalized learning and support in school yield better results and pave the way for job challenges.

Evaluating the Impact of Self-Efficacy on Transfer of Training in Graduate Employability Programs

In 1997, Albert Bandura created the concept of "self-efficacy." This represents an individual's confidence in their capabilities. It is a significant aspect of individual and career development. Individuals with high self-efficacy possess a greater belief in their own abilities. This idea motivates people to exert greater effort and achieve more ambitious objectives. Additionally, it enhances their ability to effectively manage difficulties.Self-efficacy has been the primary subject of numerous research investigations. These studies examine the impact of self-efficacy on individuals' practical use of acquired knowledge. Paine's 2021 study provides evidence in favor of the notion that self-efficacy is of utmost importance. It facilitates individuals adapting to changes and acquiring new abilities. This facilitates the transition from the learning phase to the working phase. Self-efficacy holds significant importance. It facilitates the professional development and management of novel workplace obstacles. Additionally, it provides us with a valuable understanding of the process of human development.

In 2019, Gegenfurtner and his team carried out a study examining the impact of self-efficacy on job training and education, thereby contributing to the continuing discourse about post-graduation employability. Their research established a distinct association between self-assurance, excitement, and active engagement. This combination fosters an ideal setting for the effective implementation of knowledge obtained in educational institutions in a professional setting. The study emphasizes the importance of self-confidence in public speaking and further emphasizes its role in successful training programs. The level of self-confidence greatly influences how well someone applies the information they gain.

In 2020, Seatmann and Ely conducted a study examining the correlation between self-efficacy and job performance. Additionally, they examined the implications of this on graduates' employment prospects. Their analysis of other findings demonstrated a distinct correlation. Enhanced self-assurance resulted in improved job performance. This study imparted two significant insights. Initially, self-assurance holds significant significance. It could enhance the effectiveness of training programs. Additionally, it can facilitate individuals in securing employment. Furthermore, by tailoring training programs to enhance self-assurance, they may yield more favorable outcomes. These discoveries have the potential to enhance the effectiveness of job training.

An intriguing subject for investigation within the graduate employability programs of the Talent Enhancement Institute (TEl) is the critical role of self-efficacy in turning training into measurable performance at work. It highlights the importance of self-efficacy as a tool for making training programs moreeffective, implying that boosting graduates' self-belief could greatly improve their capacity to apply what they've learned in the real world. We proposed Hypothesis 1 based on the preceding discussion:

Null Hypothesis ($H1^0$): There is no significant relationship between individual self-efficacy and transfer of training.

Alternative Hypothesis ($H1^1$): There is a significant relationship between individual self-efficacy and transfer of training.

Assessing the Influence of Program Design on Transfer of Training in Graduate Employability Programs

Certain attitudes, including the education technology, the assistance systems, and the adaptation of the specific needs of each student, provide an advanced understanding of the complexity of the transition of professional knowledge. This research draws attention to the difficulty in building flourishing preparation programs and underscores the significance of a comprehensive methodology. Each point of the whole program should be considered comprehensively, so to guarantee expertise. By advancing a configuration focusing on the learners, Velada and his group recommended an incorporated system, better solidifying the compounds of the preparation conditions.

Moreover, Harvey et al. (2018) and Chen et al. (2021) worked on how technology can facilitate the courses of those postgraduate students. They have found that adding digital tools into course plans could help the students better engage and memorize. It can also improve the class. Because of the development of the technics, we can enrich the content of the class, and provide more practical experiences and instructions. They mention that it is effective to combine the technics with traditional education. Still, Chen and his team say that this approach can make the class even better. By utilizing technology tools cleverly, we can make the learning process more practical and efficient, which comes from the students' more comprehensive preparation for everything they are about to face in the class. This research shows that the consistency of digital resources and long-tested education manner will benefit learners of higher levels. Technology provides an opportunity to enhance the educational experience, no matter in paths of facilitating the engagement, preservation, or real-world skill building if being applied judiciously alongside in-person teaching.

Tomlinson et al. (2020) and Arabi et al. (2023) found that good planning improves job results for graduates. The studies show clear links between program design, knowledge application, and job market shifts. These findings stress the need for updating courses based on job market trends. Graduates' current needs and future career obstacles should be the focus. A well-designed curriculum contributes to better training and effective career preparations.

Program design is analogous to solving a challenge. The impact on training outcomes is significant, particularly in the context of graduate employability programs at the Talent Enhancement Institute (TEl). It resembles an elaborate scheme. It consolidates several elements. Topics such as industry relevance, practical learning, mentorship, and emerging technologies. The objective is to assist graduates. To assist individuals in confronting their professional obstacles and commencing their professional journeys. Based on the discussion, we thought the training design would facilitate the transfer of training. So, we proposed Hypothesis 2:

Null Hypothesis (H20): There is no significant relationship between training design and transfer of training.
Alternative Hypothesis (H21): There is a significant relationship between training design and transfer of training.

Examining Trainee Characteristics on Transfer of Training in Graduate Employability Programs

Noe (2005) demonstrated the importance of characteristics such as prior knowledge, cognitive ability, and motivation in influencing the effectiveness of training sessions. His work established a foundation for investigating the influence of characteristics on capacities. In addition, Colquitt et al. (2017) investigated the impact of specific personality traits. Research has demonstrated that people exhibiting greater openness and

diligence tend to grasp instruction more proficiently and productively employ it in their jobs. This underscores the necessity to tailor training methods to learners' traits, as it mirrors the intricate bond between qualities and the aptitude to employ classroom insights in genuine work settings.

In 2022, Kang et al. discussed how educational background and career goal affect the employees to utilize the content of training in working reality. In this research, they mention that there is a significant difference between the personality, the preferred method to learn new things, and the interests and career ambitions of the participants. Aligning the training with the trainees' anticipated needs and goals promotes significant learning and improves the effective application skills in their jobs. The research stresses that there can be a huge difference between personal quality, the preferred ways of learning new information, interests, and professional ambitions. Putting the training in the same line with the presumed requirements and goals of the trainers can facilitate the learning process and thus effectively improve the practical skills at work. Goldstein and colleagues further discussed how diversity affects the results of training in 2020. They have found that acquiring diversity means personalization. A diverse training environment can better simulate the real working milieu by adapting to different kinds of study approaches. Moreover, it can teach more general skills and knowledge, thus being more attractive. This expands the applicability and usefulness of the training material. This research shows that the refinement of the employment ability and the maximization of the effects of this training program needs to be formed and arranged according to the singular features and demands of each trainer.

This research focuses on the key influence of the personality features of the participants in the effectiveness of this Talent Enhancement Institute's (TEI) training program. Their specific qualities, such as the nature of the trainee, their cultural background, education level, and career goals will significantly affect their ability to transit capacity and experience across different fields of labor. One's personality is important in deciding whether he can successfully transition his ability, skill, and knowledge from one single field into another, this emphasizes the great contribution of one's quality in translating the gained materials into working behaviors. Understanding this better shall be helpful to focus on the customization of courses, so to ensure the students can incorporate their traits and properly use their obtained advantages in working procedures. Based on this, Hypothesis 3 was developed:

Null Hypothesis ($H3^0$): There is no significant relationship between trainee characteristics and transfer of training.

Alternative Hypothesis ($H3^1$): There is a significant relationship between trainee characteristics and transfer of training.

Moderating Effects

There is expanding educational intrigue in the relationship between studying conditions in the work environment and preparation, driving excellent employment execution. In 2010, Schein proposed a phrase to portray an extraordinary natural habitat. He called it a "learning culture.". It is not unpredictable; it is just a spot where new ideas are welcomed, information is circulated, and new data is consistently accessible. The place needs their laborers' expert turn of events, is open to taking dangers, and extraordinarily esteems innovative thoughts. Such an atmosphere urges representatives to consistently extend their insight and abilities, allowing them to attempt new things and approach troubles from new points of view. It permits correspondence and joint effort across divisions, empowering different points of view and bringing more inventive arrangements. The consistent advancement of employees' aptitudes and information sets the association up for maintainable achievement, as its employees are constantly getting ready to tackle evolving difficulties.

Several studies have delved deeply into the substantial effect of cultivating a learning culture on organizations. Paine's research from 2021, investigations by Sessa and London from 2015, and Egan et al. from 2004 focused on how nurturing an environment where employees continually develop their skills makes a notable impact. The results from these examinations propose that fostering an atmosphere emphasizing learning significantly improves staff competencies and boosts overall business performance. Empirical proof suggests that generating a setting conducive to ongoing education benefits companies and individuals. Martocchio and

Webster added further insight in 2018. They believe that instruction is more powerful in these situations and that the advantages can be tailored according to specific needs. Creating a "learning culture" has proven to be a crucially important influencing aspect.

There is limited research on how self-efficacy, training design, and trainee characteristics interact with learning culture to facilitate the transfer of training. However, the creation of a learning environment can increase employees' confidence in the skills they have learned, thereby strengthening their sense of self-efficacy (Malureanu et al., 2021). Fostering a good learning culture implies that an experienced work organization values goal setting, goal achievement, and the pursuit of standards of excellence through reciprocity (i.e., feeling obliged to reciprocate the preferential treatment received by the organization) (Kim et al., 2020), which will motivate high-self-efficacy trainees to apply their newly acquired skills to their work.

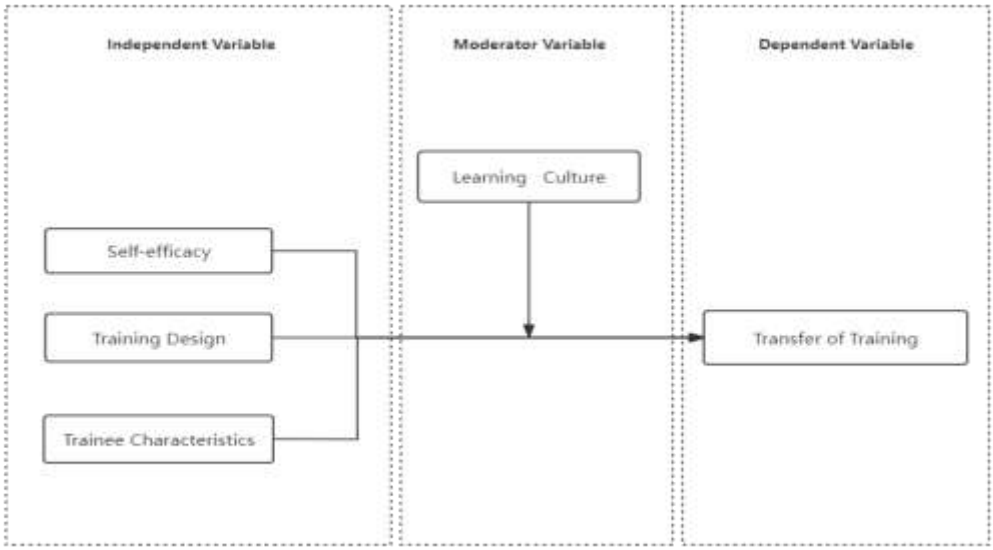
On the other hand, trainees with different characteristics may differ in their perception of the learning culture (Nikandrou et al., 2009). Individuals interpret information cues from the external environment by receiving them and responding accordingly. It is worth noting that trainees with different characteristics who are in a supportive learning atmosphere absorb the training content in the context of their characteristics, i.e., the expectations of their competence (Minja et al., 2022), and through vivid cues available in the work environment, which may lead to a higher level of transfer of training.

Although there is no direct evidence in the literature to suggest that learning culture moderates the link between training design and transfer of training, some scholars have argued that the conceptual constructs of training design and transfer of training reflect the extent of transfer mechanisms in training program (Li & Pilz, 2023; Gegenfurtner et al., 2020). The adequacy of training design influences whether trainees can apply the skills learned on the job and facilitates the link between learning and on-the-job performance through the connection between examples, methods, and activities. Research has found that training design varies between organizations depending on content, culture, and other contextual factors (Garavan, et al., 2021). Learning culture influences the organization's emphasis on training and the allocation of training resources (Akdere & Egan, 2020). If an organization prioritizes learning and encourages employees to continuously improve, it is likely to place greater emphasis on the practicality of training, its integration with job practices, and the evaluation of training outcomes (Casey et al., 2021). Such training designs are more conducive to the transfer and application of training content to the workplace. Based on the above discussion, we put forward Hypothesis 4.

Null Hypothesis ($H4^0$): Learning culture does not moderate the relationship between self-efficacy, training design, and trainee characteristics on the transfer of training.
Alternative Hypothesis ($H4^1$): Learning culture moderates the relationship between self-efficacy, training design, and trainee characteristics on the transfer of training.

Conceptual Framework: At the Talent Enhancement Institute (TEl), researchers found the key elements that make training stick in an organization's learning culture. Using the lenses of Social Cognitive Theory (SCT) and Agility Theory (AT), the study had two goals: First, the researcher explored how trainee self-efficacy (IV1), training design (IV2), and trainee characteristics (IV3) impact the successful transfer of training (DV). Lastly, researchers delved into the supportive role-learning culture as a moderator between every independent variable and the transfer of training (DV). This all-rounded view highlights the need for a helpful environment to use training programs fully. The conceptual framework outlined in Figure 1 provides:

Figure 1: The Conceptual Research Framework



4. Research Design

This study will adopt a pragmatist paradigm, using a mixed methods approach to comprehensively address the research questions and achieve the research objectives. Pragmatism is problem-centered and outcome-focused, allowing a combination of qualitative and quantitative methods to provide a holistic understanding of the research phenomenon (Yvonne Feilzer, 2010). This study will be designed using a convergent parallel mixed methods design. Quantitative data will be collected through questionnaires, and qualitative insights will be gathered through in-depth interviews. This approach will allow for triangulation, validate the results of both sets of data, and provide a more holistic understanding of the transfer of training from the Graduate Employability Program.

Regarding the phases of the research activity, there will be three steps. The first step is the initial assessment, which begins with a comprehensive search of the literature, collated, and analyzed to identify the factors that influence the transfer of training in Talent Enhancement Institution (TEI) programs. The second step involved group discussions and in-depth, semi-structured interviews with 25 individuals, including educators, industry professionals, and program participants. This discussion procedure included seeking participant consensus on the goals and mechanisms for measuring training transfer in the Talent Enhancement Institution (TEI) programs through our identified theoretical framework for the study, while also exploring the issues affecting training transfer and identifying potential improvements. The third step was planning data collection for model development by targeting a representative sample of graduate employability program participants with a questionnaire to ensure that data collection covered participants of different ages. A convergent parallel design will be used in this study, while quantitative data will be collected through a questionnaire survey of 125 samples, synchronized with interviews with selected participants to gain insights. Finally, the study will use SMARTPLS to analyze the quantitative data and thematic analysis in ATLAS. ti software for the qualitative data, respectively. The results of the two datasets will then be combined to propose a holistic model for improving Talent Enhancement Institution (TEI) programs through effective training transfer.

Significance of the Study

The Talent Training Institute (TEI) values this study because of its mission to improve graduate employability through the development of more effective training programs. This study critically analyzes how to improve the translation of training outcomes to meet the demands of modern education and ensure that training outcomes translate into tangible career benefits for trainees, supporting the broader goals of educational advancement and workforce development. Through this survey, we aim to provide valuable insights into improving the delivery and implementation of training to ensure that trainees' transition from learning to the world of work is smooth and effective.

Analyzing the attributes and knowledge application of potential graduates is critical. Additionally, self-affirmation, personalized learning approaches, and improvements in training techniques are crucial. These efforts will help us optimize our training programs to make them more responsive to the needs of different trainees, thus improving the quality of teaching and the measurability of training outcomes. At the same time, adapting the training experience to the needs of graduates will enhance the vigor, responsiveness, and impact of training, further achieving the goal of improving outcomes.

The study also delves into the factors that influence training outcomes, analyzing them with a combination of quantitative data and qualitative descriptions. This approach not only adds depth and insight to the investigation but also ensures the reliability of the model in practical application. Rigorous validation of the findings enhances the robustness of the study and provides reliable ideas for improving training programs, facilitating the development of trainees' competencies and the application of their knowledge.

In addition, this study supports national education and employment growth plans such as the Sustainable Development Goals for Quality Education and the Malaysian National Tertiary Education Strategic Plan (2021-2030). These plans contribute significantly to upgrading education and expanding educational opportunities by enhancing the job readiness programs for graduates. This study provides novel insights for academic discussions and the development of policies and programs to enhance the effectiveness of training. The alignment of educational outcomes with the needs of the job market is highly beneficial in enhancing the social and economic welfare of the country.

5. Conclusion

This study examines the impact of the transfer of training effectiveness for graduates based on the current situation in the Malaysian labor market. Using Social Cognitive Theory (SCT) and Agility Theory (AT), this study constructed theoretical and empirical models to investigate the process of training transfer (DV). The study focuses on analyzing how trainee self-efficacy (IV1), training design (IV2), and trainee characteristics (IV3) affect training transfer, as well as the moderating effect of learning culture. In addition, it provides insightful recommendations for effectively improving the practical application of training transfer by designing targeted training content, creating a positive learning atmosphere, and tapping into trainees' self-efficacy.

This study was designed using a pragmatic paradigm and a convergent parallel mixed methods approach, aiming to comprehensively address the research questions and fulfill the research objectives. By combining qualitative and quantitative methods, the study not only increased the richness and diversity of the data but also enhanced the reliability and comprehensiveness of the results. The study was divided into three main phases: initial assessment, group discussions, and data collection, which together supported an in-depth analysis of the factors influencing training transfer in Talent Training Institute (TEI) programs. Data collected through questionnaires and in-depth interviews will be used to develop a holistic model aimed at improving the effectiveness of talent development through effective training transfer. The data was analyzed using SMARTPLS and ATLAS.ti software to ensure insights were gained from both quantitative and qualitative perspectives, culminating in a theoretical framework that will comprehensively enhance the effectiveness of TEI programs.

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Optimising Administrative Employees' Productivity in XYZ District of Sarawak: The Role of Physical Workspace Environments

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Abstract: A pleasant physical working environment is essential to prevent unnecessary stress among administrative employees. This is because administrative employees spend most of their working hours within a building or a physical workspace environment. With these routine tasks and the extensive time spent in the workspace, discomfort can easily arise in their productivity and performance. Therefore, this study aims to identify the impact of the physical workspace environment on administrative employees' productivity at XYZ district, Sarawak, by employing four dimensions of the physical workspace environment: temperature, noise level, lighting, and color. This study employs a quantitative methodology, and questionnaires were used to collect the data by utilizing the e-survey. The data was gathered from 81 administrative employees via convenience sampling from private and public organizations located in XYZ district, Sarawak, and analyzed using reliability analysis, descriptive analysis, correlation analysis, and multiple regression analysis. The findings indicate that this study's four dimensions of the physical workspace environment, i.e., temperature, noise level, lighting, and color, have a significant relationship with administrative employees' productivity in XYZ district, Sarawak. The study concludes that organizations can significantly boost the productivity and performance of administrative employees by optimizing the physical workspace environment. It also suggests that organizations should not only aim to create a conducive workspace but also consider the preferences and well-being of their employees. This research contributes to a better understanding of the environmental factors affecting employee productivity and offers practical insights for organizational improvement in physical workspace design.

Keywords: *Employee Productivity, Physical Workspace Environment, Temperature, Noise Level, Lighting, Colour*

1. Background of the study

Productivity refers to the ratio of input to output, reflecting both the benefits and drawbacks this contribution brings to the organization (Tarro et al., 2020). An organization's success is fundamentally linked to the productivity of its employees, which in turn is influenced by their skills, competencies, expertise, and experience, as well as the efficiency with which they perform (Pearl Dlamini et al., 2022). Nonetheless, productivity increases when employees complete their tasks comfortably and satisfactorily. As such, it is the organization's responsibility, as an employer, to ensure that the workspace is comfortable and meets the needs of its employees (Morgan et al., 2021).

Furthermore, administrative employees refer to an individual who offers various forms of administrative support to an organization (Adebayo et al., 2020). The administrative employees' responsibilities include managing correspondence, managing and organizing files, scheduling appointments, and providing support services to other employees (Nuraini et al., 2023). Besides, administrative employees are generally responsible for managing a range of administrative and clerical tasks to ensure the organization operates conveniently and efficiently (Vipin et al., 2021).

Physical workspace environment, on the other hand, refers to tangible elements that can be seen and felt, such as temperature, noise level, lighting, and color. Also, employee satisfaction and encouragement should be prioritized in the physical workspace environment to ensure employees are not overburdened while performing their tasks. Therefore, a well-designed physical workspace environment can increase employees' commitment and satisfaction, which in turn will increase their productivity and efficiency (Najihah et al., 2020). A well-designed physical workspace is important because a physical workspace that fails to provide comfort

and enjoyment for employees while they perform their tasks can lead to several negative impacts on productivity, such as fatigue, stress, and anxiety (Bankins et al., 2021).

Presently, the XYZ district of Sarawak is experiencing a noticeable increase in the number of retrenchments. This number is particularly alarming because it is perceived that physical workspace environments are one of the causes of the high number of retrenchments in the district (Chuong Hock et al., 2022). In addition, Andrew et al. (2022) highlighted that a poor physical workspace environment has a negative cumulative effect on employee productivity. They mentioned that productivity can decrease when the employees are working in an uncomfortable and disengaged workspace environment.

The present study focuses on administrative employees, who typically spend most of their working hours in a building or designated physical workspace, where they are tasked with routine administrative duties (Tran et al., 2023). Abdul Rahman et al. (2023) also highlighted that the repetitive nature of these tasks and the extensive time spent in the workspace can lead to discomfort, directly impacting administrative employees' productivity and overall performance.

Realizing the above scenario, this study thus aims to identify the relationship between the physical workspace environment and administrative employees' productivity in the XYZ district of Sarawak.

2. Literature Review

Employee's Productivity: Previous researchers defined productivity as the degree to which employees are completed to the extent that employees satisfactorily meet the job demands. Productivity can also be defined as the degree to which an economy effectively uses its production inputs, such as labor and capital, to generate a specified amount of output (Miller, 2016).

In terms of organizational operations, productivity is the ratio of an organization's revenue to its employees' costs (Oseland, 2017). The increased productivity can also increase both the functional and organizational performance, as well as the quality of the products or services produced by its employees (Indraswari & Martono, 2020).

It is reported that personal, social, organizational, and environmental significantly influence administrative employees' productivity within the physical workspace environment (Al Horr et al., 2016). However, the present study will only focus on environmental variables to assess the productivity levels of administrative employees.

Physical Workspace Environment: A physical workspace environment is a necessary component of administrative employees' lives that allows them to execute their jobs effectively (Rorong, 2016). In addition, the physical workspace environment is a setting within which administrative tasks are carried out (Herneoja et al., 2022). It is well-established that there is a positive correlation between this factor and its impact on the organization's productivity (Grant et al., 2019).

The physical workspace environment plays a significant role in administrative employees' productivity. The variables of the physical workspace environment have a significant impact on the administrative employees' productivity, whether they are unfavorable or favorable (Frastika & Franksiska, 2021). In particular, when employees are physically and mentally motivated to work, their productivity will directly improve (Kolpakova et al., 2019). The authors also claimed that a conducive physical workspace environment reduces absenteeism and improves administrative employees' productivity, resulting in a rise in physical workspace productivity. Furthermore, an adjustable and adaptive physical workspace that enables employees to personalize their workspace environment to their personal preferences could potentially improve their satisfaction and productivity (Nnenna Nancy, 2022). Thus, the first hypothesis of the study is:
H1: There is a significant relationship between the physical workplace environment and administrative employees' productivity.

Temperature: Productivity is an extremely reliant state on employees and is influenced by various physical, physiological, and psychological factors (Deng et al., 2020). Therefore, different employees may have varying degrees of temperature sensitivity and preferences. These factors should be taken into consideration so that employees can remain comfortable while remaining productive (Alzahrani et al., 2022).

Since temperature plays a significant influence on the physical workspace environment, having comfortable working conditions can help employees be more productive and feel less stressed (Chang & Kajackaite, 2019). Both excessively high and inadequately low temperatures can hurt administrative employees' productivity, particularly in tasks that require cognitive, physical, and perceptual routines (Tian et al., 2021). Besides, temperatures that are too high will have a direct effect on health and will cause employees to experience heat stress as well as heat exhaustion (Tian et al., 2021). Chang and Kajackaite (2019) clarify that a warmer temperature may be preferable for a thin person. They also emphasize that somebody who is not relatively as thin might benefit more from a lower temperature. Conversely, a less intelligent person can benefit more from a lower temperature.

Melissa (2020) mentioned the significant relationship between temperature and administrative employees' productivity. Specifically, she emphasized that personal preferences in the physical workspace environment, including temperature, will impact the administrative employees' productivity and performance. Therefore, the second hypothesis of the study is:
H1a: There is a significant relationship between temperature and administrative employees' productivity.

Noise Level: Noise level can be defined as undesirable and disturbing sounds, such as talking between co-workers, ringing telephones, sounds from office machinery, and footsteps (Alzahrani et al., 2023). The authors also demonstrated that noise from open-plan layouts and similar situations severely affects administrative employees' productivity. In addition, louder noise can produce physiologic changes, such as an increase in blood pressure(Appel-Meulenbroek et al., 2021). The physical workspace environment, particularly the open-plan layout, is the greatest obstacle for administrative employees because it can negatively affect administrative employees' productivity (Sander et al., 2019). This is possible because an open-plan layout encourages employees within the same building to communicate with each other, which results in focusing more on the conversation rather than their work (Ayoko et al., 2023). The authors also mention that noise perceptions such as telephones ringing and employees' conversations are associated with impaired concentration, reduced task motivation, and overstimulation, which triggers employees' negative reactions to their physical workspace environment.

Unwanted noise from other employees can also cause stress, especially in situations that require other employees to work in noisy environments. Providing private rooms to mitigate this issue is often costly due to the expenses of building partitions (De Salvio et al., 2023). When employees in an open-plan layout are unable to remove themselves from distracting noise, they feel emotionally distracted, as though they have lost their privacy (Hafee et al., 2019). This is because each administrative employee has a sensitivity toward noise levels. Some of them may feel unbothered by the loud noise level. Meanwhile, some of them may feel irritated by the excessive noise level. As such, the third hypothesis of the study is:
H1b: There is a significant relationship between noise levels and administrative employees' productivity.

Lighting: Lighting is required in a physical workspace environment to provide safety and allow all tasks to be completed timely and efficiently (Kumar et al., 2017). Inadequate lighting is also a source of stress, leading to poor administrative employees' productivity when they are exposed to an uncomfortable physical workspace environment characterized by excessive glare, dull, bulk, or a lack of natural light (Galanti et al., 2021).

The effects of lighting on administrative employees' productivity are essentially determined by four factors: source (sunlight, incandescent, fluorescent, and sodium vapor), fixtures (ceiling, desk, and floor lamp), quantity (lighting), and arrangement (Cheung et al., 2021).

According to the findings of Aryani et al. (2020), visual comfort is the most significant factor in achieving administrative employees' productivity in a physical workspace environment in terms of health and

productivity. With sufficient lighting, employees can do their tasks more quickly, with fewer mistakes, accidents, and absenteeism (Carter et al., 2021).

There are significant relationships between lighting and the productivity of administrative employees; insufficient lighting leads to migraines, eyestrain, and decreased work productivity and motivation, increasing error rates and causing stress and sleep problems. Conversely, adequate lighting can reduce discomfort and fatigue, improve concentration, and increase productivity (Cheung et al., 2021). Thus, the fourth hypothesis of the study is:
H1c: There is a significant relationship between lighting and administrative employees' productivity.

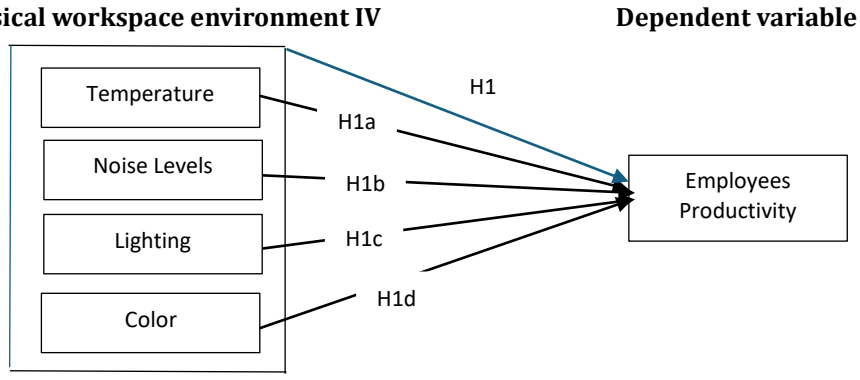
Color: Color is one of the most powerful impulses received from the external world that relates to the inner world. The different colors employed in the design of the physical workspace environment generate varied psychological responses in employees (Nolé Fajardo et al., 2023). Consequently, the authors suggested that the presence of a particular color in a physical workspace environment may have an impact on administrative employees' productivity, well-being, and performance.

Previous studies compared the impact of red and blue on the mood and productivity of administrative employees. When employees shifted from one color room to another, particularly from blue to red, they made more mistakes while typing for 20 minutes (Ulusoy & Aslanoğlu, 2022). In addition, employees considered the white physical workspace environment to be less distracting and preferred it more than the red physical workspace environment (Hughes, 2022). The comparison between green and red physical workspace environments also plays a significant finding in a study by Hughes (2020). The choice of color may have served as a means for administrative employees to cope with environmental stress, thus helping them to maintain focus on their immediate tasks (Orel & Alonso Almeida, 2019).

Different cognitive responses can be stimulated by different colors, and these responses may influence emotional, mental, and even administrative employees' physical health (Savavibool et al., 2018). For example, cool color tones such as blue, green, and purple are related to serenity, peace, and attention. Meanwhile, colors such as red, orange, and yellow are related to vitality, excitement, and activity (Savavibool et al., 2018). Thus, the fifth hypothesis of the study is:
H1d: There is a significant relationship between color and administrative employees' productivity.

Figure 1 below illustrates the conceptual framework of the study.

Figure 1: Conceptual Framework of the Study



3 Research Methodology

This study applies a quantitative approach, which involves collecting and examining numerical data related to administrative employees' productivity in the XYZ district, Sarawak.

Eighty-five respondents were targeted, including the permanent, part-time, and contract administrative employees working in the government and private sector in XYZ district, Sarawak. This minimum number of

respondents is required to reach an acceptable level of statistical significance, which is calculated using G-power. However, 101 responses from 101 respondents were successfully collected via the online survey. Unfortunately, data from twenty respondents were excluded due to invalid responses, making the total sample size eighty-one respondents. Administrative employees were selected for the present study because they can commonly be found throughout the workforce in almost every sector and organization in the XYZ district of Sarawak. Furthermore, administrative employees typically spend most of their working hours in a building or designated physical workspace, where they are tasked with routine administrative duties (Tran et al., 2023). Abdul Rahman et al. (2023) also highlighted that the repetitive nature of these tasks and the extensive time spent in the workspace can lead to discomfort, directly impacting administrative employees' productivity and overall performance.

The respondents were selected via the non-probability sampling technique, which is convenient sampling. Convenience sampling is a non-probability sampling technique in which respondents are chosen by the researcher based on their accessibility and availability (Berndt, 2020). Regarding data collection, this study utilized an online survey distributed to the respondents through Google Forms. The Google Forms link was distributed to several social media platforms such as WhatsApp, Instagram, Telegram, and X (previously known as Twitter). Therefore, the link was only spread to administrative employees who are currently working in the government and private sector. To ensure that only the administrative employees answered the online survey, the researcher contacted the representative from each organization's administrative employees for consent to ensure that the respondents met the criteria of the study.

This study also utilized IBM SPSS as a data analysis tool and applied reliability analysis, descriptive analysis, correlation analysis, and multiple regression analysis to the data. Data analysis is the procedure of examining, filtering, converting, and modeling data to find relevant information, create conclusions, and assist in decision-making (Abdul Aziz et al., 2021).

Demographic Profile of the Respondents: Table 1 exhibits the respondents' demographic profiles for this study. The demographic profile of the study reveals that 44.4% (36 out of 81 respondents) are from 41 – 50 years old, with the majority being female at 66.7% (60 out of 81 respondents). The educational background is mainly comprised of individuals with a bachelor's degree, accounting for 46.9% (38 out of 81 respondents). In terms of employment status, a significant majority, 90.1% (73 out of 81 respondents), are in permanent positions. The sector with the highest representation in government, making up 76.5% (62 out of 81 respondents). Lastly, the most common job level among respondents is that of an administrative clerk, representing 45.7% (37 out of 81 respondents).

Table 1: Demographic Profile of the Respondents

Respondent Profile	Frequency	Percentage
Age		
20 = 30 years old	12	14.8
31 – 40 years old	22	27.2
41 – 50 years old	36	44.4
51 – 60 years old	11	12.6
Gender		
Female	60	66.7
Male	21	23.3
Education Level		
Sijil Pelajaran Malaysia (SPM)	11	13.6
Sijil Tinggi Pelajaran Malaysia (STPM)	9	11.1
Diploma	13	16.0
Bachelor's Degree	38	46.9
Master	10	12.3
Employment Status		
Permanent	73	90.1
Part-Time	3	3.7

Contract	5	6.2
Sector		
Government	62	76.5
Private	19	23.5
Job Level		
Executive	15	18.5
Assistant Manager	8	9.9
Supervisor	10	12.3
Admin Clerk	37	45.7
Support Employee	11	13.6
Type of Workspace		
Open Space	73	90.1
Private Space	8	9.9

4. Findings and Discussion

This section provides an overview of the study's findings and discussion. It aims to determine the relationship between the physical workspace environment and employees' productivity among administrative employees in the XYZ district of Sarawak.

Table 2: Cronbach's Alpha Score for Actual Study (n = 81).

	No. of Items	Cronbach's Alpha	Internal Consistency
	Independent Variables		
Temperature	5	.762	Good
Noise Level	4	.806	Very Good
Lighting	5	.725	Good
Color	4	.813	Very Good
	Dependent Variable		
Employee Productivity	10	.913	Excellent

The Cronbach's alpha for the dependent variable, namely employees' productivity value in Table 2, was considered excellent as its range was α = 0.913. The Cronbach's alpha for independent variables for noise level and color was very good, with α = 0.806 and α = 0.813, respectively. The Cronbach's alpha for temperature (α = 0.762) and lighting (α = 0.725) were considered good, falling at the range of 0.7 to 0.8. As a result, it can be said that the Cronbach alpha for dependent and independent variables for the present study was considered reliable and consistent, ensuring the validity of the study.

Table 3 below illustrates the relationship between the physical workspace environment, which encompasses temperature, noise level, lighting, and color, and the productivity of administrative employees.

Hypotheses 1: There is a Significant Relationship between the Physical Workspace Environment and Administrative Employees' Productivity.

Table 3: Pearson Correlation Analysis between Physical Workspace Environment and Employees' Productivity

		Physical Workspace Environment	Employees' productivity
Physical Workspace Environment	Pearson Correlation	1	.731**
	Sig. (2 tailed)		.000

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

Table 3 shows the correlation analysis between the physical workspace environment and administrative employees' productivity. The findings show that the physical workspace environment and employees' productivity have a positive significant relationship. The correlation between temperature and administrative employees' productivity was r= 0.731, with the significant value being p=0.000. Therefore, it exhibits that the physical environment has a strong positive and significant relationship with administrative employees' productivity in the XYZ district of Sarawak.

A friendly and well-planned physical workspace environment fosters positive outcomes, which increases employees' productivity. On the other hand, an unmotivated physical workspace environment can lead to stress, distraction, and discomfort, directly decreasing employee productivity. Thus, it is crucial for organizations that aim to optimize employees' productivity to comprehend the significance of a conducive and pleasant physical workspace environment.

A physical workspace that maintains a comfortable temperature, provides adequate lighting, ensures acceptable noise levels, and features pleasant color schemes can significantly enhance administrative employees' productivity. However, it is crucial to remember that not all dimensions of the physical workspace environment are significant to the employees' productivity. Studies have drawn emphasis on certain disadvantages, such as dehumanization related to specific physical workspace environments (Taskin et al., 2019). For instance, the potential advantages of open-plan and flexible physical workspace environments on employees' productivity did not always occur (Taskin et al., 2019). This is because a poorly designed physical workspace, characterized by discomfort, excessive noise, inadequate lighting, and unappealing color schemes, can negatively impact employees' productivity.

Hypotheses 1a: There is a Significant Relationship between Temperature and Administrative Employees' Productivity.

Table 4: Correlation between Temperature and Administrative Employees' Productivity

		Noise Level	Employee Productivity
Noise Level	Pearson Correlation	1	.626**
	Sig. (2 – tailed)		.000
	N	81	81

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

Table 4 shows the correlation analysis between temperature and employees' productivity. The findings show that temperature and employees' productivity have a significant relationship. The correlation between temperature and administrative employees' productivity was at r= 0.626 and a significant value of p=0.000. Therefore, it shows that temperature in a physical environment has a moderate positive and significant relationship with administrative employees' productivity in the XYZ district of Sarawak.

Employees who work in hot physical workspace environments are more likely to feel irritated and depressed, while employees who work in cold environments could feel drowsy and have less energy. This is echoed by the findings of Seppanen et al. (2005), who said that employees' productivity increases at temperatures between 21°C and 22°C and decreases at temperatures between 23°C and 24 °C.

On really hot days, employees can be more likely to be absent from work because of the heat stress, which may lead them to be less productive at work (Somanathan et al., 2021). Moreover, productivity decreased because of the temperature discomfort brought on by the hot air (Deng et al., 2020). Additionally, as said by Herdianzah et al. (2023) and Lai et al. (2023), abrupt temperature changes could positively affect employees' productivity and performance.

Hypotheses 1b: There is a Significant Relationship between Noise Level and Administrative Employees' Productivity.

Table 5: Correlation between Noise Level and Administrative Employees' Productivity

		Noise Level	Employee Productivity
Noise Level	Pearson Correlation	1	.626**
	Sig. (2 – tailed)		.000
	N	81	81

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

Table 5 displays the analysis of noise level and employees' productivity. The results demonstrate a significant correlation between noise level and administrative employees' productivity, with the correlation at r = 0.626 and the significant value at p = 0.00. Thus, the study demonstrates a moderate positive and significant relationship between noise level and administrative employees' productivity in the XYZ district of Sarawak.

A controlled noise environment can help to create more focused and productive employees; meanwhile, excessive or disruptive noise in the working environment could cause employees to take longer time to complete their tasks and reduce their productivity. Besides, employees who are exposed to high noise levels regularly may experience stress and fatigue. This is because high stress levels have been related to the lower level of employees' productivity. The study's finding is similar to the findings of numerous studies showing that noise adversely affects employees' productivity, indicating that the volume and quality of unwanted noise can significantly hinder employees' performance (Simion et al., 2022).

In the physical workspace environment, noise levels that are too high can negatively affect employees, causing physical symptoms, including high blood pressure and stress related to work (Alfiah Aras et al., 2023). Furthermore, in an open-plan layout, noise sources, including those unrelated to work conversation, machine noise, and phone ringing, can decrease employees' productivity (Felipe et al. et al., 2023). Also, employees with high noise sensitivity are more likely to experience discomfort, stress, or loss of concentration in noisy environments, which can negatively affect their productivity.

Hypotheses 1c: There is a Significant Relationship between Lighting and Administrative Employees' Productivity.

Table 6: Correlation between Lighting and Administrative Employees' Productivity

		Lighting	Employees' productivity
Lighting	Pearson Correlation	1	.513**
	Sig. (2 – tailed)		.000
	N	81	81

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

Table 6 illustrates the analysis of the correlation between lighting and administrative employees' productivity. The findings show a significant correlation between lighting and employees' productivity, with a correlation value of r = 0.513 and a significant value of p = 0.000. Hence, the present study can conclude that lighting has a moderate positive and significant relationship with administrative employees' productivity in the XYZ district of Sarawak. This data is parallel with what is discovered by Zeng et al. (2023), who found that lighting in a physical workspace environment can enhance employees' productivity, particularly for tasks such as reviewing documents on paper or typing a report on the computer (Zeng et al., 2023).

Insufficient lighting can cause discomfort and eyestrain, resulting in a decrease in employees' productivity. Meanwhile, adequate lighting can improve mood and focus, thereby increasing employees' productivity. This is because inconvenient glare from excessively bright lighting or poorly physical workspace environment light sources can cause discomfort and reduce employees' visibility. Furthermore, gloomy or unbalanced lighting can increase tension and exhaustion of the employees, while bright or well-balanced lighting is frequently related to positive feelings, and both lighting conditions can impact employees' productivity (Nolé Fajardo et al., 2023).

Poor lighting in a physical workspace environment can cause psychological and emotional discomfort in employees, leading to errors and a decrease in the quality of work. In this situation, employees may neglect to see the details on the documents and make mistakes due to the difficulties that they have in completing their tasks (Anao & Edene, 2023).

Hypotheses 1d: There is a Significant Relationship between Color and Administrative Employees' Productivity.

Table 7: Correlation between Color and Administrative Employees' Productivity

		Color	Employees' productivity
Color	Pearson Correlation	1	.686**
	Sig. (2 – tailed)		.000
	N	81	81

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

Table 7 shows the analysis of the correlation between color and administrative employees' productivity. The findings demonstrated a significant correlation between color and administrative employees' productivity, with a correlation value of r = 0.686 and a significant value of 0.000. Therefore, the study revealed a significant moderate positive correlation between color and administrative employees' productivity in the XYZ district of Sarawak.

The data exhibited in Table 6 is aligned with the findings of Jain and Nayak (2023) as well as Amani et al. (2020). They discovered that enhancing color conditions in the physical workspace environment boosts employees' creativity, performance, and productivity.

Cool tones, such as blue and green, are frequently related to a serene and calm mood. These colors can create a calming physical workspace environment that encourages concentration and increases employee productivity. Besides, employees who are exposed to cool tones of color can reduce their stress levels and do their work in a peaceful environment, thereby boosting their productivity. Meanwhile, warm tones, such as red and yellow, can increase employees' energy and motivation to do their tasks better.

Table 8: R Squared Analysis of the Study

Model	R	R Square	ljusted R Square	l. Error of the Estimate
1	.751[a]	.564	.541	.36749

a. Predictors: (Constant), Temperature, Noise Level, Lighting, Colour
b. Dependent Variables: Employees' productivity

Table 9: Multiple Regression Analysis of the Physical Workspace Environment

Mode l		Unstandardized B	Coefficient s Std. Error	Standardized. Coefficients Beta	t	Sig.
1	**(Constant)**	.657	.341		1.923	.058
	Temperature	.102	.089	.123	1.143	.257
	Noise Level	.218	.106	.235	2.057	.043
	Lighting	.109	.082	.124	1.318	.191
	Color	.430	.106	.414	4.041	.000

a. Dependent Variable: Employees' productivity. The coefficient is significant at the level p = > 0.05.

As shown in Table 8, this study identifies the most influential variable of the physical workspace environment that influences employees' productivity. Data in Table 7 exhibits that the most influential variable that has an impact on administrative employees' productivity in the XYZ district of Sarawak is color, with a beta value of 0.430 and a significant value of 0.000. This finding proves that different colors could bring different emotional

responses to administrative employees at XYZ district of Sarawak. Hence, choosing a color for a particular physical workspace environment that matches the desired psychological could impact administrative employees' behavior and productivity.

This finding is echoed by Bajaj et al. (2022), who emphasize the importance of balancing employee efficiency with visual appeal through color. It is essential to consider the nature of work conducted in the physical workspace environment and the desired productivity levels. As cited by Obuba (2023), employing color must be approached with caution, as excessive use can be distracting and may diminish productivity among administrative employees.

5. Managerial Implications and Recommendations

The study's findings revealed a correlation between the physical workspace environment and productivity among administrative employees in the XYZ district of Sarawak. The physical workspace environment, which encompasses temperature, noise level, lighting, and colors, significantly impacts employees' productivity and is critical to many aspects of organizational performance.

Therefore, the study recommends that managers maintain a comfortable temperature and ensure that heating, ventilation, and air conditioning (HVAC) systems are routinely maintained. Employers need to provide personal space for heaters or fans so that administrative employees can adjust the temperature in their physical workspace according to their preferences.

In addition, department managers must provide a quiet working space for the administrative employees so they can concentrate on completing their tasks. Alternatively, they can provide soundproof equipment or headphones with noise cancellation so the administrative employees can manage the disruptive noise independently. To optimize natural light, such as sunlight intake, managers must physically relocate their workspace to be closed to the windows by using transparent or translucent curtain materials.

When establishing color schemes that complement the tastes and cultural backgrounds of administrative employees, managers must take into account the nature of the physical workspace environment. The influence of color on employees' productivity is profound, as it can significantly affect mood, energy levels, and psychological comfort, all of which are critical to optimizing work output. Consequently, the findings of the study show that selecting the right palette is paramount as the most suitable element, which could enhance focus, reduce fatigue, and stimulate creativity, thereby becoming the most influential element in boosting administrative employees' productivity at the XYZ district of Sarawak.

Besides, for future study recommendations, it is suggested that a qualitative study be conducted on how temperature, noise level, lighting, and color could affect employees' productivity. The goal is to identify how these elements interact and impact one another in a practical physical workspace environment. Also, future studies can examine the possible advantages of a physical environment for work that is personalized or adaptable. Future studies may also examine how adjusting temperature, noise level, lighting, and color to personal preferences can increase employees' productivity and general well-being.

Conclusion

Productive teamwork, stress reduction, and overall well-being are all enhanced by a comfortable and motivating physical workspace environment. Furthermore, a well-planned physical workspace can enhance productivity by reducing external distractions and enhancing their focus. Employers who invest in creating an appealing physical workspace environment can probably expect to improve productivity in the long term and increase employee retention and satisfaction. Nevertheless, there is a lack of doubt about the impact that a physical workspace environment has, particularly on the productivity of administrative employees. This study thus aims to identify the relationship between the workspace environment and employees' productivity among administrative employees in the district of XYZ of Sarawak.

The findings of the study reveal that the physical workspace environment, which includes temperature, noise level, lighting, and color, was found to be significantly correlated with employees' productivity in the district of

XYZ of Sarawak. Additionally, for all the variables of the physical workspace environment utilized in this study, color was the most influential variable impacting the productivity of administrative employees in the said district. The study concludes that organizations can significantly boost the productivity and performance of administrative employees by optimizing the physical workspace environment. It suggests that organizations should not only aim to create a conducive workspace but also consider the preferences and well-being of their employees in these environments.

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The Relationship of Succession Planning, Career Attitude and Job Security with Turnover Intention at Private University in Malaysia

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Abstract: Employee turnover has long been acknowledged as a silent threat to any organization. The turnover phenomenon has been a highly pressing concern for private universities' faculties. Despite the attentiveness and responsiveness of high rates of turnover around the globe, research on the area of turnover or turnover intention, as well as succession planning, career attitude and job security is limited. Past studies have not assessed the scale and nature of the association between these three variables. Thus, this study aims to explore the relationship between succession planning, career attitude and job security toward turnover intention. The study specifically focused on a private university in Malaysia and data was gathered through 148 questionnaire surveys. The conceptual framework developed consisted of dimensions of succession planning, career attitude, job security and turnover intention. A set of three hypotheses was developed that assessed whether there existed a positive or negative relationship between these three variables. For data analysis, the study utilized various numbers of statistical techniques such as exploratory factor analysis, confirmatory factor analysis, and cross-case analysis. The study results indicated that the research model developed was a good predictor of turnover intention and provided general support for all three hypotheses. The study also found that there was a positive relationship between succession planning, career attitude, and job security toward turnover intention. The empirical relationships between variables further proposed that it would be favorable and advantageous to the private university management to recuperate university turnover situations. Further discussions included the research contributions and implications.

Keywords: *Turnover Intention, Succession Planning, Career Attitude and Job Security.*

1. Introduction and Background

In recent times, the turnover cost has become a critical issue since it substantially drains the institutional operating revenue and the previous researchers mentioned that the hiring and training of a replacement staff would approximately cost an institution 50% of an employee's annual salary (De Winne et al., 2019).

When an employee chooses to leave the organization, it is expected due to low productivity. The organization should have a negligible amount of lost time in finding a competent replacement for the job and institution (De Winne et al., 2019). Besides, if the vacancy is not filled, the workload left needs to be distributed among the remaining employees until the position is filled. This situation will eventually pressure other employees to leave the organization with the increasing and unbearable workload. It has become a concern, even with the employment of contract employees, 'job hopping' or loyalty, information leakage, and monetary investment associated with employees' job training (De Winne et al., 2019). As a consequence, general turnovers and turnover intentions have since increased and have become precarious hiccups among many organizations.

According to Chazali et al.(2021), the deliberate turnover of employees, especially the valuable ones will not only affect the organization in terms of replacement costs and disruption of work, but it will also have a procrastinating effect on the nation's plans to produce high-caliber human capital and workforce. The search of literature further illuminates the fact that there are close links between human resource management practices, particularly regarding succession planning, career attitude, and job security (Ali and Mehreen, 2019). The purpose of this paper is to research the determinants influencing turnover intention in a private university, such as succession planning, career attitude, and job security, and to evaluate the relationship between the determinants and turnover intention. This study will examine the following research question which is whether there is a relationship between succession planning, career attitude, and job security with turnover intention among employees at a private university. We should be mindful and take action to strategize

and be aware of the reason behind the employee turnover intention so that we will easily find the strategy and solution to solve the issue.

2. Literature Review

Relationship between Succession Planning and Turnover Intention

In their empirical investigation of the connection between succession planning and employee performance in the service industry, Ali et al.,(2019) discovered a substantial association between performance evaluation and succession planning while Ali and Mehreen (2019) theorized that the firm's efforts, include succession planning, is necessary to ensure the workers do not have the intention to leave the firm and move toward employee retention. It benefits businesses since it lowers the cost of human resources for acquiring and training replacement employees. Hassan and Siddiqui (2020) on the other hand stated that companies that employ autocratic management styles have higher absenteeism and employee turnover. At the same time, using case study techniques in the banking industry, Hassan and Siddiqui (2020) discovered that it helps employees advance in their careers, which in turn motivates them and lowers the organizations' turnover.

According to research done by Bano et al. (2022) on succession planning, it promotes leadership continuity, which benefits businesses by ensuring success and sustainability while that continuity decreases the human cost of worker turnover. Raz (2017) however, found that ethical leadership significantly minimizes turnover intentions among employees. A cost-benefit analysis of succession planning among leaders done by Raz (2017), noted that this method greatly reduces the cost of replacement while creating a pipeline of potential future leaders. In the study of Odim et al. (2017) on the leadership succession for school principals in an urban district, the researchers noted that the district did not put succession plans in place to ensure sustainability and seamless transitions of successors in place of predecessors. There is also a recent study that looked at management perceptions of succession planning in the agricultural industry from a theoretical perspective which revealed that succession planning is essential at all organizational levels to address the problems of retirement, termination, death, and resignation (Hassan and Siddiqui, 2020).

Relationship between Career Attitude and Turnover Intention

People assess their success in their jobs by comparing it to the accomplishments of others (Guo and Baruch, 2021). According to the hypothesis, people may experience feelings of deprivation when they compare their career journey to those of a referent hence it leads to turnover intention in their current profession. Besides, the employee must also plan their career path which reflects their career attitude throughout their journey. Employees must have a future ahead career plan to boost their career attitude instead of comparing the organization's perks and benefits. When there is a difference between the result they seek and what they get, they notice that a comparative other has more than they do and this is where the social comparisons may lead people to feel frustrated and intend to leave to look for a better future (Lin and Chen, 2020).

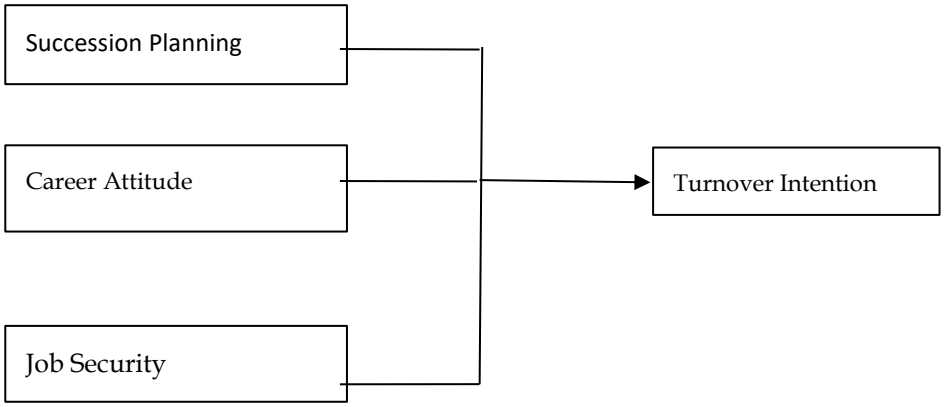
In fact, studies have shown that people who compare themselves with those who do better and earn more frequently experience feelings of deprivation and dissatisfaction with their career aspirations (Offergelt et al., 2019). In comparison, contrast effects establish a lower benchmark against which to measure one's current circumstance, improving a person's belief that they are making career advancements. This inflates one's sense of control and capability (Esteves et al., 2021).

Relationship between Job Security and Turnover Intention

Ali and Mehreen (2019), in their research, revealed that job stability affects workers' health and has a good impact on employee turnover. Altinay et al. (2019) on the other hand, proposed a model of job security that is tested while examining the connections between employee performance, absenteeism, and this creates the intention to leave the company. It has been discovered that job security has more complicated consequences and increases stress. In a similar research, according to Ullah (2018), job security improves organizational effectiveness where employees will perform more productively if they are secured in terms of their jobs. For this reason, employers are integrating job security with chances for career progression, which includes talent management to keep smart, ambitious, and competent employees. Such organizational policies have a significant negative impact on employees' intention to leave their jobs.

Employee turnover has been a major issue that raises concerns for employers regarding job security. Ullah (2018) explained that job security bridges the gap between employment and unemployment. This refers to employees' feelings of impending joblessness. Job security is defined by Ali and Mehreen (2019) as having a job that is secure and from which one is unlikely to be fired. As a result, employees respond negatively to this situation (Arijanto et al., 2020). However, Obeng et al. (2020) referred to the general concern about the future existence of work as job security. Employment dissatisfaction and insecurity in this context influence organizational conditions, thus leading to a raised overall likelihood of turnover (Arijanto et al., 2020). Research has shown that job security among employees is the contributor to job frustration (Arijanto et al., 2020) where workers who feel their jobs are insecure are likely to engage in intention to leave, which primarily affects the turnover rate. Also, Arijanto et al. (2020) assumed that employees who feel uneasy at work are more likely to leave their jobs. As such, empirical research has repeatedly shown that the likelihood of turnover and job stability are inversely connected (Rangrez et al., 2022).

Figure 1: Conceptual frameworks of the relationship of succession planning, career attitude, and job security toward turnover intention.



Thus, the hypotheses addressed for this research are:

H01: There is no significant relationship between succession planning and turnover intention.
HA1: There is a significant relationship between succession planning and turnover intention.
H02: There is no significant relationship between career attitude and turnover intention.
HA2: There is a significant relationship between career attitude and turnover intention.
H03: There is no significant relationship between job security and turnover intention.
HA3: There is a significant relationship between job security and turnover intention.

3. Research Methodology

For this research study, researchers chose a quantitative cross-sectional method using standardized questionnaires for conducting a causal study to identify the relationship between variables. Descriptive (frequency analysis) studies were undertaken to describe the characteristics of respondents (age, gender, education, year of employment, etc.). The unit of analysis for this study was the individual employees in one of the Malaysian private universities. For this study, the researcher chose a non-probability sampling design of convenience sampling. The total sample size is 148. The researcher used an interval scale which is also known as the Likert scale for all variables in this study ranging from 1 = 'Strongly Disagree' to 5 = 'Strongly Agree'.

4. Results and Discussion

The respondents of this study consisted of 75 (49.3%) male respondents and 77 (50.7%) female who took part in this survey. As for the age group, the highest was those in the range 36-40 years old with 41 (27.0%) respondents followed by those who are in the age group of 41-45 years old with 31 (20.4%). Next was the respondents with the age group of 46-50 years old which contributed to 29 (19.1%) respondents. Respondents who are 31-35 years old represent 14.5% (22) of the total number of respondents. 14 (9.2%) respondents from

the age category of more than 55 years old also took part in this survey. Only 8 (5.3%) employees whose age is below 30 years old and 7 (4.6%) employees whose age range between 51-55 participated in this survey. Therefore, the finding shows that most of the respondents were in their 36s and 40s age range. Furthermore, Malay ethnicity represents the majority of respondents with 147 (96.7%) respondents. It was shadowed by 2 (1.3%) respondents from the other ethnicity and Indian respectively. However, the least are Chinese with 1 (0.7%) respondent. Most of the respondents are married with 122 (80.3%) respondents. Next, 23 (15.1%) respondents were still single. 4 (2.6%) respondents are divorced and 3 (2.0%) are in complicated marital status (others). The demographic questions also required the respondents to provide information on their overall working experiences. The responses indicate that most of the respondents, 79 (52.0%) have been working for more than 15 years whilst 33 (21.7%) respondents have overall working experiences of 6 – 10 years. Furthermore, 32 (21.1%) respondents who have working experiences for 11 - 15 years and 8 (5.3%) have overall working experiences for less than 5 years participated in this survey.

Table 1: Descriptive Statistics, Cronbach Alpha, and Pearson Correlation of All Study Variables

Variables	Turnover Intention	Succession Planning	Career Attitude	Job Security
Turnover Intention	(0.74)			
Succession Planning	-.332**	(0.82)		
Career Attitude	-.381**	-.572**	(0.85)	
Job Security	-.404**	.587**	-.802**	*(.87)*
Mean	3.15	3.08	3.31	3.37
SD	.987	.904	.696	.826

Note: ** Correlation is significant at the 0.01 level (2-tailed); Entries in parenthesis indicate Cronbach Alpha values.

Table 1 has tabulated the Cronbach Values for both the dependent and independent variables. The turnover intention, which is the dependent variable, has the range of reliable consistency of Cronbach Alpha value of .74. As for independent variables, job security has the highest Cronbach Alpha value of .87 which represents a very reliable consistency for research followed by succession planning and career attitude which contest a very reliable consistency of .82 and .85 respectively. Based on the Cronbach value results, all questions representing the variables (dependent and independent variables) in the questionnaire are proper and reliable for the research.

Table 1 also shows the descriptive statistics of all study variables. The mean for succession planning was the lowest i.e. 3.08 out of 5, while the highest was Job Security at 3.37. These indicate that on average employees neither agreed nor disagreed with the items that have been asked in the questionnaire. Hence it can be concluded that their Succession Planning, Career Attitude, Job Security, and Turnover Intention were at a moderate level. Pearson Correlation was used to analyze the strength of association between all variables in this research study. The first independent variable which is Succession Planning indicated that r = -0.332** while p = 0.000. The result shows that there was a negative significant and low association between Succession Planning and Turnover Intention. The second independent variable which is Career Attitude indicated that r = -0.381** while p = 0.000. The result showed that there was a negative significant and low association between Career Attitude and Turnover Intention. The result shows that there was a positive significant and strong association between both variables.

Table 2: Multiple Regression Analysis

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	5.054	.356		14.209	.000
Succession Planning	-.135	.101	-.126	-1.340	.000
Career Attitude	-.173	.177	-.124	-.979	.006
Job Security	-.270	.151	-.230	-1.788	

F value	11.000
Sig	.000
Adjusted R2	1.66
R2	.182

As shown in Table 2, the outcome for the succession planning variable is not significant as it stands at 18.2% (0.182) which is higher than the significant level of 5%. Thus, it explains that succession planning has a negative and no significant relationship among the management staff of this private university. Next, the p-value of career attitude is 32.9% (0.329) and it is higher than the 5% significant level which shows the career attitude variable is not significant. Following, the job security variable is not a significant p-value of 7.6% (0.076) which is more than 5%. All variables in the equation are using the standard beta unit. When the standard deviation of the dependent variables such as succession planning, career attitude, and job security increase by one-unit, turnover intention among employees increases by 0.101, 0.177, and 0.151 standard deviations respectively.

Based on the study, There is no significant relationship between succession planning and turnover intention in the management staff of the private university. This was supported by Gusanto et al., 2023 who found no significant relationship between succession planning and turnover intention in their study. There is no significant relationship between career attitude and turnover intention in the management staff of the private universities which is supported by Von Hippel et al., 2013. There is a significant relationship between career attitude and turnover intention while Job attitude by employees has no significant effect on increasing turnover intention because this factor is more directed at a positive factor which is considered not to interfere with employee turnover (Ramlawati et al., 2021). This study also found that there is no significant relationship between job security and turnover intention to management staff in a study from Sun et al. (2020), the perception of job security does not have a significant and direct effect on turnover intent.

5. Conclusion

The main objective of this study was to examine the relationship between succession planning, career attitude, and job security towards turnover intention in a private university in Kuala Lumpur. The study was conducted among 148 respondents. Based on the findings where all the variables i.e. succession planning, career attitude, and job security do not have significant relationships with turnover, the results of multiple regression analysis confirmed that all the variables are not significant where it is based on the standardized coefficients Beta value.

In this study, we use turnover intention as the dependent variable. Since turnover intention leads to actual turnover, the use of turnover intention as the dependent variable is appropriate (Hossain, 2019). The study also suggests that turnover intention be used over turnover behavior because many external factors affect turnover behavior, predicting actual turnover more difficult than intention. Therefore, we found out that the turnover is categorized under voluntary turnover intention which is specifically discussing and using the terms of general turnover. This organization needs to put stress on these factors that impact turnover intention. Finally, the recommendation for future research includes examining other factors that will influence the turnover intention of management staff of this organization which might include wages and benefits, working hours, and working environment. HR manages employees' perceptions, expectations of their employers' commitment and support towards them will shape their feelings toward the organization. Therefore, having encouragement and a positive feeling may decrease these employees' turnover intentions, especially if succession planning, career attitude, and job security are linked with higher levels of career commitment.

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Navigating the Path to Equitable and Sustainable Digital Agriculture among Small Farmers in Malaysia: A Comprehensive Review

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Abstract: The agriculture sector has transformed with the advent of digital agriculture, smart farming and Agriculture 4.0, yet the social science aspects remain underexplored. This article aims to address this gap by conducting a comprehensive review of 17 studies that focus on the social, economic, and institutional dimensions of precision farming, digital agriculture, smart farming and Agriculture 4.0. The objectives are to explore the dynamics between digital agriculture and farm diversity and to identify emerging concerns related to economics, business, institutions, and ethics. Methodologically, the review synthesizes existing literature on socio-cyber-physical-ecological systems, digital agriculture policy processes, the transition from analog to digital agriculture and the global landscape of digital agriculture development. It adopts a multidisciplinary and transdisciplinary approach to provide a holistic understanding of the topic. The outcomes reveal significant implications for policymakers, farmers, and stakeholders in the agriculture sector. Key findings highlight the necessity of addressing social and economic impacts, such as data privacy, security, and accessibility, and the effects of automation on rural employment and community structures. The review emphasizes the importance of developing institutional and governance frameworks to support digital agriculture practices and tailoring policies to promote sustainable and equitable use of digital technologies. It explores how infrastructure, connectivity and local capacities influence the adoption of digital agriculture technologies. The review advocates for further research on the intersection of digital agriculture with broader societal trends, such as climate change, urbanization, and food system transformations, to develop strategies for sustainable and resilient food systems.

Keywords: *Digital agriculture; smart farming; agriculture innovation; precision farming; agriculture 4.0; socio-cyber-physical-ecological systems; digital agricultural policy*

1. Introduction

Digital agriculture, also known as smart farming or Agriculture 4.0, has been described as the future of agriculture. With the Fourth Industrial Revolution driving innovation across all sectors, it is no surprise that the agricultural industry is also transforming. Digital agriculture incorporates innovative technologies such as precision agriculture, the Internet of Things (IoT), artificial intelligence (AI), and big data analytics to improve crop yields, optimize resource use, and reduce environmental impact. The potential benefits of digital agriculture are vast, including increased food security, economic growth, and sustainability. As such, it has attracted significant attention from researchers, policymakers, and industry leaders (McGrath et al., 2023). In this paper, we present a synthesis of the current state of research in digital agriculture and explore future directions for this rapidly evolving field.

The adoption of digital innovations is increasingly pervasive across various sectors of society. Digitalization encompasses a range of technologies including big data, the Internet of Things (IoT), augmented reality, robotics, sensors, 3D printing, system integration, ubiquitous connectivity, artificial intelligence (AI), machine learning, digital twins, and blockchain (Dayioğlu & Turker, 2021; Chen et al., 2020). In the realms of agriculture and related food, fiber, and bioenergy supply chains and systems, digitalization is anticipated to profoundly alter daily routines and production processes (Smith, 2018). Early indicators of this transformation are already apparent (Di Silvestre et al., 2018; Rotz et al., 2019a). The integration of digital technologies into agricultural production systems, value chains, and food systems has given rise to several concepts, such as Smart Farming (Blok and Gremmen, 2018), Precision Agriculture (Wolf and Buttel, 1996; Eastwood et al., 2017b), Decision Agriculture (Leonard et al., 2017), Digital Agriculture (Shepherd et al., 2018), Agriculture 4.0 (Rose and Chilvers, 2018), and Agriculture Numérique (French) (Numerical Agriculture Bellon Maurel and Huyghe,

2016).

Digitalization in agriculture entails the application of advanced technologies such as sensors, machines, drones, and satellites to monitor animals, soil, water, plants, and human activity both on the farm and throughout the wider value chain and food system (Basso and Antle, 2020). This involves the use of diverse data types, including but not limited to, geolocation, weather conditions, behavioral patterns, phytosanitary statuses, consumption rates, energy usage, pricing, and economic indicators. By leveraging continuous monitoring and extensive big data analytics, this information is processed and interpreted to enable more informed decision-making (Eastwood et al., 2017a). Agricultural digitalization is anticipated to drive the technological enhancement of food systems, value chains, and production methodologies. Furthermore, it is proposed that digitalization can address social issues in farming, such as improving food traceability (Wolfert et al., 2017), enhancing animal welfare standards, particularly in livestock farming, and mitigating the environmental impacts of agricultural practices (Rose and Chilvers, 2018; Busse et al., 2015). The pervasive nature of data in digital agriculture is also expected to facilitate knowledge sharing and learning, as well as enhance the monitoring of crises and controversies within agricultural sectors (Yeates, 2017).

There are significant expectations regarding the ongoing spread and transformative impact of digital technologies, given their extensive adoption in industries such as cropping and viticulture through precision farming over the past two decades (Eastwood et al., 2017a). Despite this, current scientific literature on digital agriculture has primarily focused on the technical aspects of these technologies to enhance agricultural practices and productivity (Rutten et al., 2013; Dick et al., 2019), as well as improving post-farmgate processes like postharvest quality monitoring within logistics and real-time traceability (Rodrigues et al., 2019). Numerous review articles have emerged discussing topics such as precision agriculture, big data analytics, drones, robotics, artificial intelligence, IoT, 3D printing, and the transformative potential these digital technologies hold for agricultural production systems, value chains, and food systems (Mogili and Deepak, 2018; Patrcio and Rieder, 2018; Zhao et al., 2019).

This article offers an overview and thematic organization of social science literature on digital agriculture, showcasing the wide array of perspectives and their complementary nature in understanding digitalization. The article also aims to highlight the potential benefits and drawbacks of digitalization for the sustainable growth of rural regions, food systems, and agriculture. Moreover, it emphasizes the need to foster the reflexivity of those involved in the advancement of digital agriculture are a spectrum of stakeholders, encompassing farmers, researchers, consultants, decision-makers, and academics.

The study aims to address three primary inquiries, namely:

- What are the primary thematic clusters that emerge in social science literature concerning the digitalization of agriculture, as identified through an exploratory review?
- How do the key insights from the reviewed articles connect to these thematic clusters, and do they open up new directions for future research?
- What gaps and opportunities exist for future social science research in the realm of digital agriculture?

To tackle the primary inquiries outlined in this review, the article initially offers a comprehensive outline of the principal thematic clusters evident in social science literature concerning digitalization within agriculture. These clusters encompass precision agriculture and smart farming, digital innovations within food systems, the influence of social and cultural factors on digital agriculture, and the policy and governance implications associated with agricultural digitalization.

Subsequently, the article delves into an analysis of the primary insights extracted from the literature, examining their correlation with these thematic clusters or their potential to instigate fresh lines of inquiry. For instance, the article discusses how precision agriculture can contribute to sustainable food production and rural development, and how social and cultural factors can influence the adoption and impact of digital innovations in agriculture. The article also examines the governance and policy implications of digital agriculture, including issues related to data ownership, privacy, and regulation.

Finally, the article identifies gaps and opportunities for future social science research in the field of digital

agriculture. These include the need for more interdisciplinary research that integrates social, economic, and environmental perspectives, as well as more studies that focus on the experiences and perceptions of farmers and other stakeholders involved in the development and implementation of digital innovations in agriculture. This review article demonstrates the importance of social science perspectives for understanding the potential of digitalization in agriculture and its broader implications for sustainable rural development and food systems. By highlighting the diversity of viewpoints and identifying gaps and opportunities for future research, this article aims to contribute to a more comprehensive and reflexive understanding of digital agriculture and its transformative potential.

2. Literature Review

Digitalization in agriculture's main social science themes: In this section, we take a closer look at the main social science themes that emerge from the literature on digitalization in agriculture. For our analysis, we utilized the Scopus database to search for articles pertaining to "digital agriculture" and "smart farming" across various journals. We specifically concentrated on journals including the Journal of Rural Studies, the Journal of Peasant Studies, Sociologia Ruralis, Agricultural Systems, NJAS-Wageningen Journal of Life Sciences, Land Use Policy, and the Journal of Agricultural Education and Extension. Additionally, we utilized snowball sampling methods, which involved citing relevant publications that were identified and filtering articles that referenced initial studies on digitalization.

Table 1: Survey of Thematic Clusters from Social Science Perspectives

Thematic cluster	The varying number of reviewed articles with some articles appearing in multiple clusters	The key social science disciplines engaged in this thematic cluster	Theoretical and methodological perspectives employed in this thematic cluster include:	Relevant Articles to the Thematic Cluster
Integration, utilization, and adaptation of digital technologies on agricultural farms.	16	• Economics • Sociology • Innovation Studies • Science and Technology Studies	Adoption and diffusion theory Behavioural psychology Practice theory Assemblage theory Cost and benefit modelling Econometrics Evolutionary economics Innovation systems	Janc et al., 2019 Knierim et al, 2019
The impact of digitalization on farmer identity, skills, and agricultural work	16	• Sociology • Social Geography • Anthropology	Political economy Practice and identity theory Studies of discourse, power, politics, and social transformation (e.g. Foucault, Bourdieu, Durkheim, Giddens) Actor-network theory Assemblage theory	Vik et al., 2019 Lioutas et al., 2019

			Gender studies Ethnography Farming styles Cultural scripts	
The intricate dynamics surrounding power dynamics, ownership structures, privacy concerns, and ethical considerations.	28	Sociology and political science Philosophy and ethics Science Technology Studies	Political economy Institutional economics Animal ethics Human ethics Responsible Research Innovation Activity theory	Van der Burg et al., 2019 Lioutas et al., 2019 Jakku et al., 2019 Bronson, 2019 Wiseman et al., 2019 Regan, 2019
Digitalization's impact on agricultural knowledge and innovation systems	27	Innovation studies Science and Technology studies Communication Science Economics	Knowledge and Innovation systems Social media analysis Learning theories Evolutionary economics Socio-technical transitions	Fielke et al., 2019 Ingram and Gaskell, 2019 Relf-Eckstein et al., 2019 Rijswijk et al., 2019 Eastwood et al., 2019 Ayre et al., 2019
Economic and Managerial Dynamics of Digitalized Agricultural Production Systems and Value Chains	21	Economics Management Science Sociology	Value chain theories Business Model Risk analysis Institutional economics Service economics	Phillips et al., 2019 Rojo Gimeno et al., 2019

Following an examination of over 100 social science publications on digital agriculture, we identified five key subject clusters of social scientific literature on the topic. These clusters emerge from a wide range of social science disciplines, including sociology, geography, economics, communication studies, management studies, innovation studies, and humanities fields such as philosophy and ethics. It's essential to emphasize that these themes encourage interdisciplinary dialogues rather than solely contrasting disciplinary viewpoints on digitalization.

Table 1 presents a summary of the thematic clusters, social science disciplines, theoretical perspectives, methodological approaches, and relevant articles associated with each cluster. It is worth mentioning that while this article focuses on digitalization in agriculture, there are also broader discussions on how digitization impacts rural communities that are covered in other works (see, for example, Salemink et al., 2017). Overall, this analysis offers a valuable starting point for understanding the key themes and perspectives that inform social science research on digital agriculture.

Farming Using Digital Technology: The first thematic cluster of social science literature on digital agriculture focuses on the use of digital technology in farming. This cluster has a well-established line of inquiry into precision technology adoption, which includes economic and behavioral elements. The research in this area primarily focuses on individual adoption factors, as well as extension and communication interventions to encourage adoption (Barnes et al., 2019). Additionally, the application of advanced farming or intelligent

farming on farms and how it changes agricultural activities has been explored using terms like "tinkering" and "assemblages" (Lowenberg-DeBoer and Erickson, 2019). Post-adoption adaptation has also been studied (Higgins et al., 2017), and this cluster draws from a range of approaches, including modeling approaches of the costs and benefits of precision farming (Schimmelpfennig and Ebel, 2016), quantitative or econometric approaches testing the effects of different variables on adoption (such as farm size and specialization, farmers' ages, education, etc.; see Higgins et al., 2017), and more qualitative work highlighting the situation of both adopters and non-adopters and accounting for less measurable factors (Annosi et al., 2019). Furthermore, some studies have examined the larger networks and innovation systems that form technology and where co-evolution between the technology and larger social and institutional settings takes place beyond the level of the farm (Eastwood et al., 2017).

Digitalization and its Impact on Farmer Identity, Skillsets, and Work Practices

This thematic cluster highlights how digitalization affects farmer identity, skills, and work practices. One line of research addresses the practical challenges of human-robot interaction in farming, focusing on ergonomics, health, and safety through systems design (Vasconez et al., 2019). Rural sociology employs a range of theoretical perspectives, including those from Foucault, Latour, Durkheim, Giddens, political economy, and assemblage theory, to explore the sociocultural implications of digitalization. Researchers argue that digitalization is reshaping what it means to be a farmer and shifting agricultural culture from experience-driven to data-driven (Van Hulst et al., 2020). It is also altering farmers' work routines and practices, increasingly dictated by "algorithmic logic" (Miles, 2019). This raises questions about the compatibility of digitalization with practices like agroecology, which necessitate direct farming rather than digitally mediated approaches (Plumecocq et al., 2018). This cluster illuminates how digitalization not only changes the way farmers work but also transforms their identity and the broader culture of agriculture.

Digitalization of Agricultural Production Processes and Value Networks: Power, Ownership, Privacy, and Ethics

Critical social science approaches to digitalization in agriculture focus on political economics and political ecologies. This cluster addresses issues such as power dynamics, data ownership, inclusion and exclusion, privacy, and ethics. Through political economics and science and technology studies, researchers examine the impact of digitalization on corporate structures, production systems, supply networks, and their associated institutions, rules, and power balances. This literature seeks to understand how these changes affect various stakeholders and how they respond or resist. It also explores ethical concerns like privacy and data ownership arising from digital technology use (Bronson and Knezevic, 2019; Miles, 2019).

These critical approaches raise concerns about the absence of governmental solutions to address the digital divides and power imbalances resulting from rapid technological advances, which could impede the integration of social concerns (Carolan, 2019; Bronson and Knezevic, 2019). Additionally, researchers highlight threats like cyberattacks that can destabilize digitalized food systems and precision agriculture systems (Trendov et al., 2019). Digital agriculture also impacts animals, for example, through robotic milking systems and technology replacing animal husbandry activities, significantly affecting dairy farming (Bear and Holloway, 2019; Schewe and Stuart, 2015). This has led to ethical debates on animal autonomy and the human-animal connections on farms.

Critical social science approaches to digitalization in agriculture provide a comprehensive framework to understand the complex interactions between digital technologies, society, and the environment. By examining power dynamics, data ownership, inclusion and exclusion, privacy, and ethics, researchers can identify the challenges and opportunities of digitalization in agriculture and develop strategies to mitigate its negative impacts while maximizing its benefits.

Agricultural Innovation and Digitalization

Digitalization is revolutionizing agricultural knowledge and innovation systems (AKIS). This thematic cluster explores AKIS from macro, meso, and micro perspectives. Innovation systems studies examine how innovation support mechanisms promote digitalization and transform themselves, for example, by adopting big data analysis (Rotz et al., 2019a). AKIS for digital agriculture is formed by high-tech enterprises, such as drone or satellite makers, service sectors, and multinationals that provide agricultural equipment like self-driving

tractors and automated milking machines (Van Hulst et al., 2020). This literature also investigates how transdisciplinary research might aid integrative solutions that consider technical, moral, social, economic, and commercial concerns (Shepherd et al., 2018).

Some studies examine how learning networks are developed to support innovation in digital agriculture from a meso viewpoint, based on theories of learning and communication. For example, several research studies have focused on how social media and digital platforms facilitate peer learning and local and international knowledge exchange (Kelly et al., 2017). Other research has examined how user-generated data influences policy choices and real-time decision-making, using social media analysis and citizen science methodologies (Cieslik et al., 2018). Further research examines the ongoing processes of how digital decision support systems are becoming more user centered (Leeuwis et al., 2018) and how advisors engage with farmers to link "digital knowledge systems" to "farmer knowledge systems" at the micro-level of knowledge systems (Rose et al., 2018; Lindblom et al., 2017).

Digitalizing Agricultural Production and Value Networks: Management and Economic Perspectives
This thematic cluster investigates the economic and managerial dimensions of digitalized agricultural production and value chains. Although substantial research exists on the broader economic and business aspects of digital technology and big data (Jouanjean, 2019), agriculture-specific studies remain relatively limited. Some studies have analyzed the costs and benefits of unmanned aircraft systems and other precision agricultural technologies (Hunt and Daughtry, 2018; Bronson and Knezevic, 2019), while others have explored investment considerations related to the adoption of precision technologies (Rutten et al., 2018). Research on the impact of precision farming on agricultural production has revealed potential disparities between countries (Miles, 2019). Furthermore, digitalized supply chains and big data services and analysis could have economic impacts extending beyond the farm (Smith, 2018).

In developing countries, market information systems have been investigated for their potential to reduce information asymmetries and improve market access (Agyekumhene et al., 2018). In the context of industrialized agriculture, discussions are ongoing about creating information systems to help farmers manage risks, whether climatic or financial (Fraisse et al., 2006). Business models for these services often include innovative insurance schemes tailored for farmers, such as index-based frameworks for climate insurance. However, research on the economic models of digital agriculture remains limited, and existing typologies frequently focus on new direct marketing strategies for farmers and consumers (Bronson, 2018).

Studies on power dynamics in digital agriculture have highlighted the potential drawbacks of vertically integrated systems and innovative business models from political, institutional economic, or value chain perspectives. Under these arrangements, large international firms offer comprehensive "digital package deals" to farmers (Bronson and Knezevic, 2016). As Wolf and Buttel (1996) predicted in the 1990s, these package deals tend to maintain power dynamics favoring agricultural models that rely heavily on chemical inputs. However, innovative business strategies could open new opportunities for transforming value chains. For example, the concept of the "circular economy" seeks ways to convert traditional waste streams into value-added products through on-farm processing (Carolan, 2018b). Additionally, start-ups are introducing platform technologies designed to reduce food waste at the consumer end of urban food systems (Galliano et al., 2017).

3. Contributions of the Articles

Thematic Cluster: Adoption, Usage, and Adaptation of Digital Technologies
Despite the numerous promises and case studies highlighting the growth of digital technology in agriculture, farmers remain hesitant to adopt these technologies. Two quantitative studies address this knowledge gap. Janc et al. (2019) explore internet usage among Polish farmers, highlighting some foundational requirements for digitalizing their processes. The study reveals a significant "digital gap" in internet access and usage, noting that the social fabric of Polish agriculture may be weakened as digital technology is seen as individualistic and potentially eroding traditional attitudes and institutions associated with shared knowledge acquisition based on family and neighborly ties.

Thematic Cluster: Effects of Digitization on Farmer Identity, Skills, and Agricultural Labor

This paper discusses two findings related to the impact of digitization on farmer identity, skills, and agricultural labor. Vik et al. (2019) investigate how automatic milking systems (AMS) in Norwegian dairy farming influence farm labor, farmer skills, and identity. Their study reveals the broader networks and processes shaping this technology and its social and political implications, which affect the performance of robots. They find that milking robots are purchased for quality of life improvements, such as a more flexible workweek, reduced physical effort, and alignment with future dairy farming standards. Policy changes have responded to these fundamental shifts rather than driving them.

Thematic Cluster: Digitalizing Agricultural Production Systems and Value Chains: Power, Ownership, Privacy, and Ethics

This article synthesizes research from various industries and supply chains to examine how digital technologies impact power dynamics, data ownership, and privacy issues. Five studies from Europe, North America, and Australia address these themes. Continuing a discussion initiated by Wolf and Buttel (1996) and revisited in recent years, these papers question whether the digitization of agriculture disrupts supply networks or reinforces the dominance of major players. Van der Burg et al. (2019) review the ethics literature in smart agriculture, identifying three key themes: data ownership and accessibility, power distribution, and societal implications. Despite growing academic, policy, and practical interest in the ethics of smart farming and digital agriculture, the authors note a lack of explicit articulation in research and social dialogues regarding the role and significance of digital farms.

Thematic Cluster: Economics and Management of Digitalized Agricultural Production Systems and Value Chains

This cluster focuses on two articles related to the economics and management of digitalized agricultural production systems and value chains. Rojo Gimeno et al. (2019) assess the importance of information for precision cattle husbandry, similar to the work of Ayre and Eastwood. They pose a critical question: can more accurate information from digital technologies enhance economic value? The paper proposes a framework for data collection, decision-making, and action that impacts several criteria, illustrating the factors influencing these stages.

4. Future Outlook: Emerging and New Research Themes and Questions

This section outlines potential research themes and questions for future social science investigations concerning the economic and ethical aspects of digitization in agriculture. The suggested research themes emerge from the five thematic clusters detailed in Section 2, highlighting their multiple interconnections. Additionally, we propose four new thematic domains to expand the scope of future research endeavors.
Developing Theme Clusters via Study

The development of theme clusters is crucial as it allows researchers to identify key themes and topics explored in previous studies. This process provides a deeper understanding of the existing literature and helps identify research gaps that need to be addressed in future studies. This section will describe theme clusters via study and consider them in the context of digital agriculture research.

Emerging Issues in Digital Technology Uptake, Usage, and Adaptation

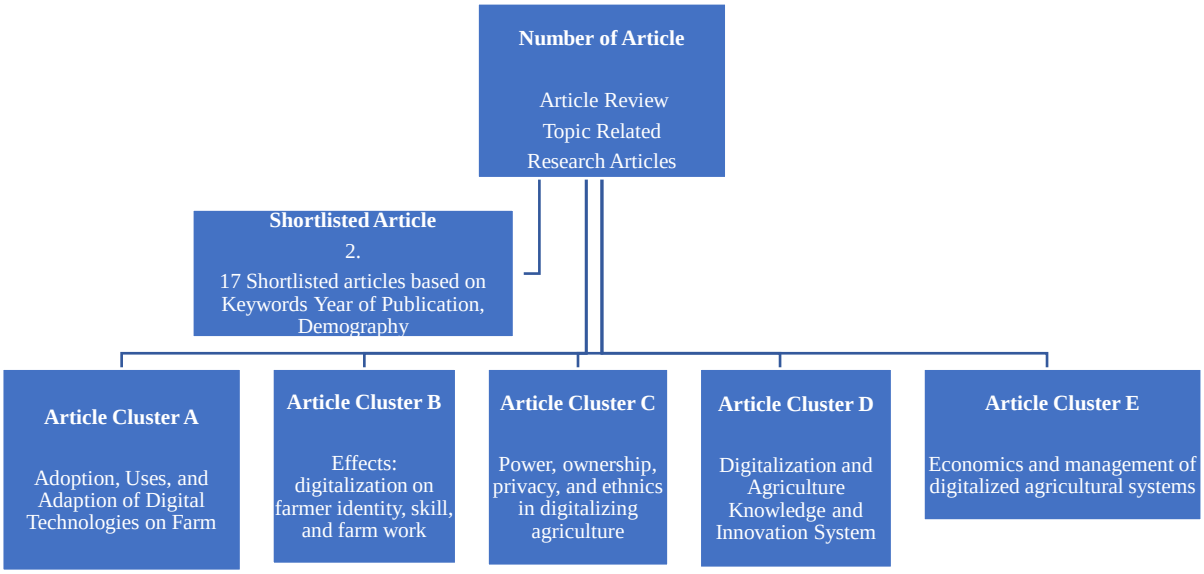
Research on the adoption, usage, and adaptation of digital technologies in agriculture, such as that by Knierim et al. (2019), suggests examining the role of farm types, farming practices, and producer characteristics in digital agricultural technology acceptance and adaptation. Future investigations might consider the following questions:

- Who benefits and who loses with the implementation of digital agricultural technology, and why? How do agricultural actors share advantages and risks?
- How does farm size influence digital agriculture adoption? Does digitization lead to increased farm size and capital concentration, facilitating more standardization and remote monitoring of agricultural practices? How do these factors relate to value chains and food systems?
- How can digital agriculture promote agricultural innovation through feedback, learning, and experimentation? After the widespread implementation of digital agricultural tools, how will farmers

develop and apply experiential knowledge?

- How can humans and animals coevolve with sensors and drones in digital agriculture?

Figure 1: Themes adopted for this article



Farmer Identity, Skills, and Job Concerns

Studies by Vik et al. (2019) and Lioutas et al. (2019) address various empirical issues regarding the implications of digitalization on farmer identity, skills, and agricultural labor. Further research is needed to understand how digitalization affects farming practices, social media use, and gender relations. Potential research questions include:

- What is the impact of Smart Farming, Digital Agriculture, and Agriculture 4.0 on implicit dichotomies such as "Smart Farming" versus "Dumb Farming" and "Farmer 4.0" versus "Farmer 3.0"?
- How do personas like "YouTubers," "cyborg farmers," "geek farmers," "joystick farmers," and "drone farmers" emerge from the convergence of digital and analog farmer worlds?
- What is the influence of social media on farmer identity and job-related concerns, and how does it impact farming communities and their leaders?
- In what ways do digital technologies impact agricultural work, including their effects on plants and animals? How can plants and animals become "digital agents" and influence human activities?
- How does digitization affect farmer skills, quality, and well-being? What is the process of deskilling/reskilling involved? How do farmers balance digital information with intuition and experience? Can farmers trust machine-generated information?
- How does digitization affect agricultural succession, future investments, and farmer choices?
- How does digitalization impact male and female farmers differently? How does it influence agricultural and rural gender relations?

Power, Ownership, Privacy, and Ethics in Agricultural Production Systems and Value Networks

The findings on power, ownership, privacy, and ethics in agricultural production systems and value chains underscore the need for reflection on these issues. Van der Burg et al. (2019) suggest four key study topics based on their review:

- Investigating the societal role of farms, broadening stakeholders' imaginations about smart farming's possible goals, and enhancing their reflection on their relative value.
- Reflecting on the epistemological choices made in data selection, the meaningful connections created between them, and their interpretation (echoing Bronson, 2019).
- Understanding the preconditions for trust among stakeholders involved in smart farming and their

relationships within a data-sharing network (as raised by Jakku et al., 2019; Wiseman et al., 2019).

- How do stakeholders' values differ in the design of digital agriculture (Wolfert et al., 2023)? While digital agriculture should serve public interests, what are the trade-offs with private interests? How are these discussions contextualized within new institutional arrangements like Public-Private Partnerships (PPP) and their implications for social concerns, empowerment, and the privatization of public assets?
- How does digital surveillance affect governance (Van der Burg et al., 2019)?
- How do digital technologies foster resistance? As suggested by Carolan (2018c), how do initiatives like Right to Repair, Farm Hack, and Data Cooperatives respond to Big Data and the Internet of Things? How do grassroots and corporate organizational configurations influence value-chain decision-making?
- How does policy or governance affect trust among actors? How do digital technologies impact power dynamics and information asymmetry (Van der Burg et al., 2019)?
- How might responsible innovation help actors manage the "unknowns" and "unseen" aspects of digital agriculture? Who perceives the risks and uncertainties? How do Responsible Research and Innovation (RRI) processes account for these factors, particularly with "digital game changers" (Brunori et al., 2019)?

Emerging Issues in Digital Knowledge and Innovation Systems

In exploring emerging issues within digital knowledge and innovation systems, Rijswijk et al. (2019) propose new terminologies such as "digiware," "Digital Agricultural Innovation Systems," and "digit grasping." These concepts warrant further exploration. Future research in Agricultural Knowledge and Innovation Systems (AKIS) could address:

As "agriculture 4.0" advances with technologies like nanotechnology, gene editing, "omics," and synthetic foods, how do traditional and non-traditional players in the agri-food sector collaborate? How does this collaboration impact cross-sectoral innovation and diverse knowledge? What role do IT companies play in local and global innovation dynamics?

- How does digitalization support agroecology, sustainable intensification, circular agriculture, and vertical farming, and what are its effects on agricultural R&D's experimentation and evaluation of innovative technologies for farmers? Can virtual models, digital twins, and Big Data replace field experimentation?
- How does digitalization influence the development of more general technologies like social media and blockchains, and how does it impact sector-specific dynamics?
- How do new modes of governance, such as interactive digital innovation through Digital Innovation Hubs, Digital Living Labs, Data Cooperatives, Hacker Spaces, open-source innovation, rural Fab-Labs, and Makerspaces, create new digital learning and innovation spaces?
- How do citizen science and social network data transfers influence agricultural innovation? What are their objectives, methods, and impacts on innovation?
- As agricultural researchers and consultants adapt to digital agriculture, how do they acquire, aggregate, curate, interpret, and apply big data?
- How do advisory services manage the processes of analog and digital unlearning, deskilling, learning, and reskilling?
- How do new advisory and research organizational structures and commercial models affect advisor and researcher competencies and training? How do machines innovate?

Economics and Management of Digitalized Agricultural Production Systems and Value Chains: New Themes and Problems

In the economics and management of digitalized agricultural production systems and value chains, several new themes and problems require exploration. While Phillips et al. (2019) provide a systematic mapping of new business models, further research is needed to determine their local or global scope and their advantages and disadvantages. Rojo Gimeno et al. (2019) propose several important questions, such as:

- What are the emerging data value-adding and brokering methods employed by various actors, and how do these methods affect the distribution of labor and capital within farms, across farms, and between farms and other supply chain actors?

- How are platform technologies, the Internet of Things, and Artificial Intelligence impacting contracts, trust, and transaction costs among value chain actors?

An Agenda for Future Research Clusters

This section proposes potential areas for future research in digital agriculture, building on existing themes. However, there may be overlooked areas that could establish new theme clusters for social science research in this field. One such area is integrating social systems into digital agricultural conceptualizations, such as cyber-physical systems (Wolfert et al., 2017) or "socio-cyber-physical systems" (Lioutas et al., 2019). This area requires conceptual reflection and empirical investigations, potentially benefiting from applying sociotechnical systems research (Carolan, 2017a), assemblage theory (Higgins et al., 2017), or activity systems theory (Lioutas et al., 2019). Concepts like "socio-technological-ecological systems" (McPhearson et al., 2016) and "innovation ecosystems" (Pigford et al., 2018) may also provide useful frameworks (Van der Jagt et al., 2019).

A "sociology of flows" or "tele-coupling" between distant yet interrelated human and natural realms (Hull and Liu, 2018) may also be a significant area of study (Oosterveer, 2015). Researchers could explore how digital agriculture, smart value chains, and food systems create new socio-cyber-physical links and feedback mechanisms. Additionally, they could examine how new methods of farmer-environment information sharing affect field layout and agricultural landscapes.

Moreover, researchers could investigate how digital agriculture systems can connect humans to farming and feedback into human systems, in terms of motorial and cognitive aspects. For example, they could examine how drones and augmented reality affect spatial dimensions, how automation/robots affect tactile and motorial aspects, and how artificial intelligence affects cognitive dimensions.

Digital twins offer a platform for exploring innovative interactions between humans, technology, and the natural environment. Moreover, in line with concepts like the "quantified self" and "digitally enhanced humans," it is important to investigate the extent to which digital technologies can push human boundaries and willingness to integrate with machines. As proposed by HolyLuczaj and Blok (2019), research should also delve into the moral and ethical implications of hybrid entities that combine digital agricultural technology with elements of the natural ecosystem, thereby bridging the traditional divide between naturalness and artificiality.

Digital Agricultural Transition Pathways

Although digital technologies are pervasive, their role in sustainability transitions has been understudied. While digital agricultural technologies are suggested to contribute to more sustainable practices (El Bilali and Allahyari, 2018a; Balasundram et al., 2023), their role in transition dynamics remains unclear. Some authors suggest that digital technology could enhance agroecological models (Van Hulst et al., 2020). Empirical questions that arise include:

- What roles do digital technologies play as change agents in agriculture?
- How do they enable actors in the agri-food sector to foster change?
- How do they support alternative 'sustainable niches,' and how do they disrupt or reinforce incumbent 'food regimes'?
- How do digital technologies relate to different agricultural paradigms, such as organic farming, agroecology, bioeconomy, regenerative agriculture, urban agriculture, and vertical farming?

Digital Agricultural Policy Making

While there has been some research on agricultural policy and law-making procedures in relation to digital agriculture (Jouanjean, 2019; Soma et al., 2019), there is still much to be explored in this area (Bronson, 2018; Bronson and Knezevic, 2019). The lack of documentation and understanding in this field has been noted in previous work (Sanderson et al., 2018; Trendov et al., 2019). Political science and law could delve deeper into this issue, and empirical questions that could be explored include:

- How can digital agriculture inform real-time policy? What are the implications of data and algorithm-driven agriculture policy? (Jouanjean, 2019)
- How does digitization affect policy audience segmentation, such as small vs. large farms, young farmers, and gender concerns? (Sanderson et al., 2018) How can policymakers address the power

concentration of digital agriculture and mitigate food system cyberattack risks? (Trendov et al., 2019)
- How do policymakers and politicians in the agricultural sector interact with information technology and Agri-tech firms? (Soma et al., 2019)
- In what ways does digital agriculture intersect with the financialization and corporatization of agriculture, and what steps can governments take to alleviate any negative consequences? (Bronson, 2018; Bronson and Knezevic, 2019)

5. Conclusion

The findings of this review demonstrate the importance of social science research in digital agriculture, as it provides crucial insights for policy and practice in this field. However, it is important to note that this review only scratches the surface of the many social science topic clusters on digital agriculture and calls for more comprehensive investigations in the future. This article enhances the current understanding of the five thematic clusters by presenting contemporary policies, practices, and institutional setups that have integrated digital agriculture across various sectors and nations. Furthermore, it suggests new avenues for research, such as conceptualizations of social systems in digital agriculture, policy formulation processes, pathways for digitally driven agricultural transitions, and the worldwide landscape of digital agriculture development.

While social science research has provided a variety of complementary viewpoints, there is a need for a greater interdisciplinary and transdisciplinary study to comprehend the institutional frameworks and stakeholder interactions that shape digital innovations and their effects. According to Taebi et al. (2014), interdisciplinary and transdisciplinary approaches can help us better understand the social dynamics of digital agricultural development. Furthermore, Roth et al. (2019) suggest that methodological innovation from analog to digital or social data science is necessary to generate accurate theories of digital societies.

As digital agriculture continues to develop and expand, it is important to address the social, natural, and technological dimensions of this field. This review has highlighted a range of fresh questions that require scientific attention, and interdisciplinary collaboration between social, natural, and technological sciences may help steer digital agricultural development in ways that maximize benefits and minimize risks. By examining and adapting to social dynamics, we can ensure that digital agriculture contributes to sustainable development and inclusive growth.

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E-Wallet Payment Usage Among Young Consumers Using Technology Continuance Theory

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Abstract: Technological innovation has paved the way for the widespread adoption of e-wallets in Malaysia. This trend has been bolstered by government initiatives and incentives promoting cashless transactions. The study aims to contribute to the ongoing efforts to encourage cashless transactions and move towards a cashless society in Malaysia and beyond. The study collected data from 443 university students who had used e-wallets for payment transactions. The analysis examined the relationships between key constructs in the Technology Continuance Theory framework. The results revealed that a positive attitude towards e-wallets significantly influences students' intention to continue using them. Additionally, perceived usefulness emerged as a crucial factor influencing students' attitudes and overall satisfaction with e-wallets. However, the study did not find a significant relationship between perceived ease of use and attitude, suggesting that ease of use may not be a primary driver of students' attitudes toward e-wallets. The theoretical implications of this study contribute to a deeper understanding of e-wallet adoption among the younger generation in higher learning institutions and provide valuable insights for the industry players. The practical implications offer guidance to key players in shaping e-wallet applications to meet the specific needs of university students, ultimately encouraging greater adoption and usage. Future research could explore additional variables and employ longitudinal studies for more comprehensive results.

Keywords: *E-wallet, intention behaviour, technology continuance theory, cashless campus, fintech.*

1. Introduction

One of the most transformative shifts in financial transactions has occurred in the ever-evolving global technology landscape. The advent of electronic payment systems has not only revolutionised businesses but has also reshaped the very fabric of economic interactions. At the forefront of this digital financial revolution is the electronic payment system, a mechanism that leverages the vast reach of the Internet to facilitate seamless transactions (Fatonah et al., 2018). Among the various manifestations of this technological innovation, the electronic wallet (e-wallet) stands out as a beacon of convenience and efficiency (Junadi & Sfenrianto, 2015). E-wallets have transformed into essential everyday tools. They are secure virtual vaults for your money, offering remote access and user-friendly interfaces to manage your finances anytime, anywhere. The significance of the e-wallet is particularly pronounced in Malaysia, where a dynamic array of 42 licensed e-wallets, including prominent names like Touch' n Go, GrabPay, FavePay, and Boost, operate under the official sanction of the Central Bank (Abdullah et al., 2020). These e-wallets have replaced traditional cash transactions and redefined the dynamics of commerce by mitigating the need for individuals to carry substantial amounts of physical currency. The advantages extend beyond convenience, as e-wallets reduce transaction times and accelerate payment processes (Purnamawati et al., 2023).

As a result, the financial landscape of Malaysia has witnessed a transformative shift, propelled by the widespread adoption and integration of e-wallets into various facets of daily transactions. This technological metamorphosis gained further momentum with the onset of the COVID-19 pandemic. In response to the need for contactless transactions, e-wallets emerged as the primary choice for Malaysians conducting their financial affairs. The growth of the e-wallet industry extends beyond consumer adoption. Businesses across retail, food and beverage, big and small vendors, online commerce, and transportation have seamlessly integrated e-wallets, highlighting their significant impact (Niu et al., 2023). The versatility and efficiency of e-wallets have made them indispensable tools for businesses navigating the demands of a rapidly changing economic landscape. Amid this technological renaissance, a significant demographic driving the adoption of e-wallets is the tech-savvy and youthful consumer base. Young customers, characterised by their adeptness with technology, are predicted to be the vanguards of e-wallet usage due to the myriad features and conveniences

offered by these digital financial tools (Sinha et al., 2019). Moreover, the Malaysian government has actively played a role in fostering the adoption of e-wallets, particularly among the youth aged 18-20.

Initiatives such as e-Tunai Rakyat, e-Penjana, e-Belia scheme, e-Pemula, and e-Tunai Belia Rahmah provide financial incentives, encouraging the uptake of e-wallets in their daily routines. Despite the initial surge in e-wallet downloads fueled by government incentives, a curious phenomenon emerges wherein usage tends to decline once these incentives are depleted (Kaur & Bahar, 2022). This intriguing trend underscores the need to delve deeper into the factors that influence sustained e-wallet usage (Cavusoglu, 2019), especially as Malaysia propels itself towards the realisation of a cashless society, driven by the increasing prevalence of e-wallets (Bank Negara Malaysia, 2019). Given the growing popularity of e-wallets in Malaysia, especially with government backing, this study investigates the factors influencing university students' intention to use them. This demographic is particularly pertinent as university students, typically entering tertiary education at 18, represent a crucial juncture in the adoption curve. Their embrace of e-wallets not only influences the immediate landscape but also holds implications for the nation's future trajectory of digital finance. To comprehensively explore and understand the intricacies of e-wallet adoption, we anchor our investigation in the Technology Continuation Theory (TCT). This theoretical lens provides a nuanced understanding of users' willingness to persist in utilising technology-based services or products, offering valuable insights into the factors that shape the ongoing relationship between users and e-wallets. This research endeavour is not merely an academic pursuit; it is a quest to unearth practical insights that can steer the course of e-wallet adoption in Malaysia and, by extension, contribute to the global discourse on the future of digital finance.

2. Literature Review

Understanding technology adoption can be complex. This study utilises the TCT developed by Liao et al. (2009) as a valuable framework. TCT builds upon three established models in Information Systems: the Technology Acceptance Model (TAM), the Expectation Confirmation Model (ECM), and the Cognitive Model (COG). TCT skilfully integrates these elements, creating a comprehensive framework that includes confirmation, perceived usefulness, perceived ease of use, satisfaction, attitude, and continuous intention.

Confirmation (CF) is particularly relevant to our study, representing individual satisfaction (Liao et al., 2009). Numerous studies illuminate a direct and positive correlation between confirmation, perceived usefulness, and satisfaction (Alraimi et al., 2015; Bhattacherjee, 2001; Oliver, 1980; Venkatesh et al., 2011). This alignment is crucial in e-wallets, where users' experiences are intricately tied to their initial expectations. Users perceive the technology as valuable when these expectations are met and exceeded, leading to heightened satisfaction. Confirmation acts as the linchpin in the user's journey with e-wallets. Users' choices are validated when anticipated benefits materialise, and a positive perception of the e-wallet's value is fostered. Users continuously evaluate their e-wallet experiences against initial expectations. Confirmation of these expectations plays a critical role in shaping their satisfaction, directly influencing how they perceive the overall usefulness of the technology.

Therefore, this study hypothesises that:

- H1: Confirmation directly influences users' perception of e-wallet usefulness.
- H2: Confirmation significantly increases user satisfaction with e-wallets.

Perceived usefulness plays a central role in technology adoption. It sheds light on users' perspectives and drives their continued engagement. As Davis (1989) noted, the belief that a system improves job performance (perceived usefulness) is crucial for understanding user behaviour. Evidence from research underscores the significance of perceived usefulness in shaping user intentions. Wu & Chen (2017) emphasise its role as a robust and direct determinant of continuance usage intentions. Beyond mere utility, perceived usefulness extends its influence, casting a cheerful glow on users' satisfaction, as noted by Bhattacherjee (2001) and fostering a favourable attitude, as indicated by Kustono et al. (2020). This interplay suggests a profound connection – if users perceive an e-wallet as applicable, a cascade of positive outcomes ensues. They not only harbour a positive attitude but also find satisfaction in its utility.

Informed by this concept of perceived usefulness, our study explores the following hypotheses that examine the interconnectedness of these factors in the context of e-wallet adoption:

- H3: Satisfaction with e-wallets increases as users perceive them to be more useful.
- H4: Perceived usefulness of e-wallets leads to a more positive attitude towards them.
- H5: Users who perceive e-wallets as valuable (applicable implies value) are likelier to continue using them.

These hypotheses elucidate the multidimensional influence of perceived usefulness on e-wallet adoption. They posit that a user's perception of utility triggers a sequential process leading to satisfaction, a positive attitude, and ultimately, a sustained relationship with e-wallets. In the ever-evolving digital landscape, perceived ease of use emerges as a compass.

Guiding users through the intricate maze of technological adoption. Coined by (Davis, 1989), it encapsulates an individual's perception that utilising a specific system demands minimal effort or is inherently straightforward. This perception of ease is pivotal in shaping the user's willingness to embrace new technology (Gupta et al., 2020). Previous research highlights the importance of Perceived Ease of Use (PEU) in technology adoption. Sinha et al. (2019a) found that users perceive a system as more useful (Perceived Usefulness) when it's easy to use. This positive perception can also lead to a more favourable attitude, as Ariffin and Lim (2020) show. Building on this knowledge, our study proposes the following hypotheses:

- H6: A user's perception of ease of use with e-wallets will positively impact their perception of usefulness.
- H7: Ease of use with e-wallets will positively affect users' attitudes towards them.

In cognitive theory, Oliver's (1980) pioneering work introduces a captivating perspective on understanding individual behavioural intentions. According to her, the intricate interplay between satisfaction and attitude is a compass for deciphering the complexities of human behaviour. The study underscores the critical role of satisfaction in influencing user attitudes and behavioural intentions towards e-wallets. Satisfaction, as defined by Bhattacherjee (2001), reflects a psychological state arising from comparing a user's expectations and the actual performance of the e-wallet. Extending Oliver's insights, our study aligns with previous investigations highlighting the profound impact of satisfaction. Scholars such as Foroughi et al. (2019) and Rahi et al. (2021) consistently affirm that satisfaction positively influences users' attitudes. When users find their experiences aligning with or surpassing expectations, a positive attitude naturally follows suit. Moving beyond perceived usefulness, our study explores the role of satisfaction and attitude in e-wallet adoption. A study by Shang and Wu (2017) suggests that technology satisfaction can positively influence attitude and intention to continue using it.

Based on this understanding, we propose the following hypotheses:

- H8: E-wallet user satisfaction leads to a more positive attitude towards the e-wallet.
- H9: E-wallet user satisfaction leads to a stronger intention to continue using the e-wallet.

As Liao et al. (2009) explain, attitudes reflect a person's feelings towards a specific behaviour. In e-wallet adoption, a positive attitude is a key indicator of a user's continued use intentions. Building on a prior study by Weng et al. (2017) and Wu & Chen (2017), which highlights the positive relationship between attitude and continued use, our final hypothesis is:

- H10: A positive attitude towards e-wallets leads to a stronger intention to continue using them.

This hypothesis crystallises that the user's overall positive or negative sentiments toward e-wallets play a pivotal role in shaping their commitment to continued usage. As we navigate the nuanced landscape of e-wallet adoption, this hypothesis offers a lens through which we can unravel the intricacies of user attitudes, ultimately contributing to a more profound understanding of the factors influencing the sustained use of these transformative digital tools.

3. Methodology

To gather insights from young Malaysian consumers, this study targeted public university students with experience using e-wallets for payments. The data collection process occurred during the second quarter of 2023 and utilised a combination of offline and online surveys. A snowball sampling method was employed. After data cleaning, 443 usable responses were retained from the initial 501 participants. This study uses a single source survey; therefore, a common method bias (CMB) analysis must be done to ensure no bias issues in the collected data. Therefore, the research added a marker variable to the questions asked of the participants. The questions were adapted from Brian & Marcia (2022), which included four questions related to the colour blue for the participants. CMB analysis shows that the value of R2 on the endogenous study model does not increase compared to the calculation of the model before the market variable is included in the study model. Therefore, there is no bias issue in the data collected.

4. Data Analysis and Results

In this study, 443 individuals participated in the survey, providing valuable insights into their age groups, gender distribution, current residential areas, and education levels. Among the respondents, the majority fell within the age range of 18 to 21, accounting for 69.5% of the total sample. The second-largest age group was 22 to 25, constituting 29.3% of the participants. Regarding gender distribution, the study exhibited a higher representation of females, comprising 65.5% of the participants, while males accounted for 34.5%. Regarding current residential areas, most respondents resided in urban settings (60.0%), whereas 40.0% lived in rural areas. Moreover, the education level of the participants varied, with the most common category being diploma holders (47.9%), followed by those with degrees (45.4%). Interestingly, only a minority possessed a PhD (0.5%), and a smaller group had pre-diploma/certificate qualifications (6.3%). The measurement model analysis assesses how well the observed variables we measure represent the underlying concepts (latent constructs) we are interested in. This ensures that the data collected is a valid and reliable reflection of the theoretical constructs. Two primary analyses are involved: convergent validity and discriminant validity test. Hair et al. (2017) establish thresholds for evaluating measurement scales in partial least squares structural equation modelling (PLS-SEM). They recommend that all factor loadings exceed 0.7, composite reliability (CR) surpasses 0.7, and the average variance extracted (AVE) is greater than 0.5.

Table 1: Convergent Validity

Variable	Item	Loading	CR	AVE	R2
Confirmation	CONF1	0.923	0.906	0.84	
	CONF2	0.915			
	CONF3	0.912			
Perceived Usefulness	PU1	0.908	0.944	0.856	0.786
	PU2	0.945			
	PU3	0.906			
	PU4	0.938			
Perceived Ease of Use	PEU1	0.895	0.926	0.811	
	PEU2	0.923			
	PEU3	0.866			
	PEU4	0.917			
Satisfaction	SAT1	0.941	0.943	0.898	0.746
	SAT2	0.959			
	SAT3	0.944			
Attitude	ATT1	0.942	0.939	0.890	0.763
	ATT2	0.943			
	ATT3	0.944			

Intention to Continue use E-Wallet	INT1	0.902	0.45	0.855	0.689
	INT2	0.954			
	INT3	0.937			
	INT4	0.905			

Whereas for the discriminant validity test, the HTMT value needs to exceed 0.90, as recommended by Gold et al. (2001). Table 2 shows no issues for all the values that have been accessed. An analysis using Fornell C & David (1981) was also conducted to test discriminant validity. All the values in Table 3 show no issues in this test, and it passes the required level.

Table 2: HTMT Ratio of Correlations

	1	2	3	4	5	6
Attitude						
Confirmation	0.810					
Intention To Continue Use	0.877	0.814				
Perceived Ease of Use	0.801	0.865	0.799			
Perceived Usefulness	0.825	0.854	0.797	0.890		
Satisfaction	0.866	0.866	0.816	0.860	0.846	

Table 3: Fornal & Lacker Result

	1	2	3	4	5	6
Attitude	0.930					
Confirmation	0.734	0.903				
Intention To Continue Use	0.811	0.739	0.906			
Perceived Ease Of Use	0.733	0.778	0.733	0.881		
Perceived Usefulness	0.767	0.778	0.742	0.841	0.911	
Satisfaction	0.796	0.78	0.751	0.783	0.781	0.923

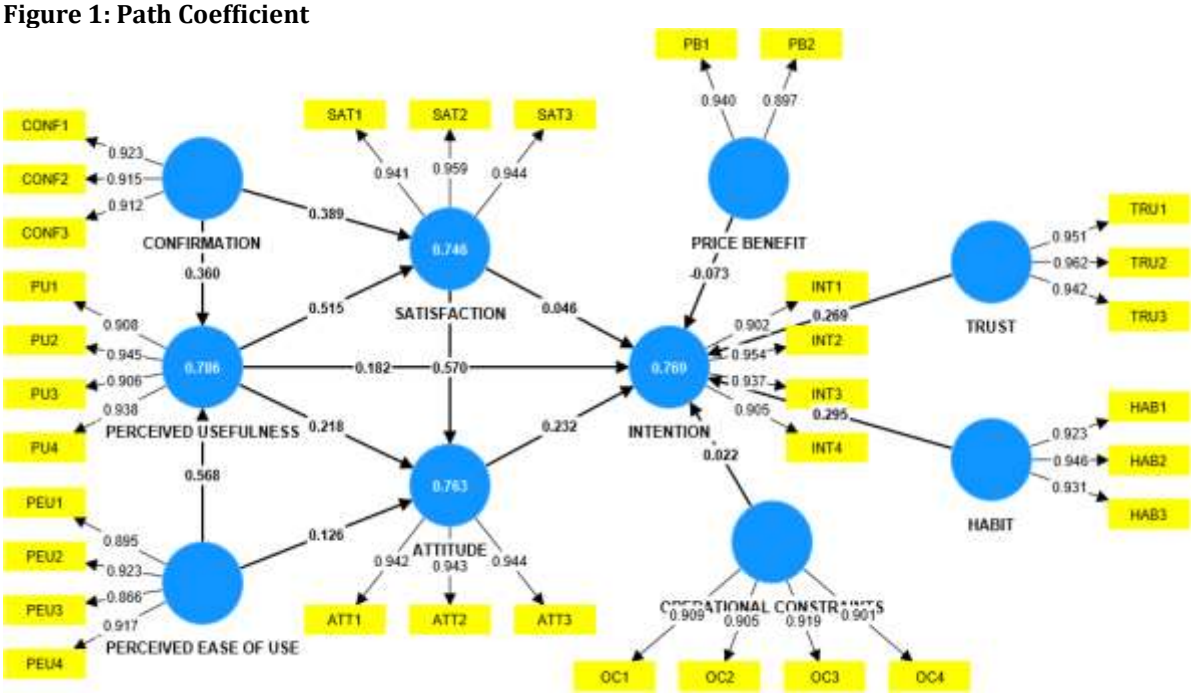
Once the measurement model's validity and reliability were established, PLS-SEM was utilised to examine the theorised connections between the variables. Researchers aim to test hypotheses, understand path coefficients, validate the theoretical model, and generate insights for any decision-making by conducting structural model analysis. Table 4 shows the result of hypotheses testing for the research study model.

Table 4: Result of Hypotheses Testing

Hypo	Path	Std. Beta	Std. Dev	t-value	p-value	PCI LL	PCI UL	Result	f2
H1	ATT -> INT	0.498	0.047	10.576	p<0.001	0.308	0.308	Accepted	0.261
H2	CON -> PU	0.312	0.036	8.745	p<0.001	0.16	0.16	Accepted	0.151
H3	CON -> SAT	0.437	0.039	11.199	p<0.001	0.275	0.275	Accepted	0.24
H4	PEOU -> ATT	0.098	0.052	1.882	P<0.003	-0.086	0.001	Rejected	0.008
H5	PEOU -> PU	0.598	0.033	18.028	p<0.001	0.456	0.567	Accepted	0.555
H6	PU -> ATT	0.315	0.053	5.917	p<0.001	0.067	0.067	Accepted	0.081
H7	PU -> INT	0.212	0.042	5.007	p<0.001	0.04	0.04	Accepted	0.051
H8	PU -> SAT	0.441	0.039	11.372	p<0.001	0.293	0.293	Accepted	0.244
H9	SAT -> ATTI	0.473	0.04	11.708	p<0.001	0.318	0.318	Accepted	0.243
H10	SAT -> INT	0.189	0.041	4.589	p<0.001	0.016	0.016	Accepted	0.036

Table 4 shows a significant positive relationship between attitude and intention to continue use (β=0.498, t=10.576, p<0.001). Secondly, a significant positive relationship between confirmation and perceived usefulness (β=0.312, t=8.745, p<0.001) is found. Thirdly, confirmation also shows a significant positive association with satisfaction (β=0.437, t=11.199, p<0.001). Fourthly, the relationship between perceived ease of use and attitude is insignificant (β=0.098, t=1.882, p<0.003). Additionally, a significant positive association exists between perceived ease of use and perceived usefulness (β=0.598, t=18.028, p<0.001). Moreover, perceived usefulness significantly impacts attitude (β=0.315, t=5.917, p<0.001). Furthermore, perceived usefulness is a strong predictor of continued use. (β=0.212, t=5.007, p<0.001). Additionally, perceived usefulness is significantly associated with satisfaction (β=0.441, t=11.372, p<0.001). Lastly, satisfaction exhibits a significant positive impact on attitude (β=0.473, t=11.708, p<0.001) and intention to use (β=0.189, t=4.589, p<0.001). In summary, nine out of ten of the hypothesised relationships are supported by the data, except for the relationship between perceived ease of use and attitude, which was insignificant. Figure 1 shows the path coefficient of the study structural model.

Figure 1: Path Coefficient



Discussion: This study employed the TCT to explore the factors influencing e-wallet adoption and continued use among university students. Our findings reveal that attitude, perceived usefulness, and confirmation significantly impact students' intention to keep using e-wallets. University students with a positive attitude towards e-wallets, likely due to their perceived convenience, security, and user-friendliness, are likelier to continue using them. This aligns with previous research by Weng et al. (2017) and Wu & Chen (2017). This indicates that a positive attitude towards e-wallets is a crucial predictor of students' intention to use them. The favourable perception of e-wallets may be attributed to their convenience, security, and user-friendly interfaces, which have likely contributed to their widespread adoption among this demographic. This aligns with the perceived convenience, security, and user-friendliness often associated with e-wallets, making them attractive to students. Furthermore, confirmation of usefulness strengthens users' trust and perceived value, leading to higher satisfaction and, ultimately, continued use, consistent with the findings by Alraimi et al. (2015), Bhattacherjee (2001), Oliver (1980) and Venkatesh et al. (2011).

Students who perceive e-wallets as beneficial tend to develop a more positive attitude towards them, highlighting the interplay between these constructs. When users perceive e-wallets as beneficial, they are more likely to experience higher satisfaction with the technology. This positive experience will enhance their intention to continue using e-wallets. Interestingly, ease of use did not directly influence attitude. This suggests that factors like convenience and perceived usefulness might be more important for young users. While ease of

use remains valuable, a user-friendly interface might be a baseline expectation for young consumers. Their decision to continue using e-wallets likely hinges more on the perceived value and practical benefits they offer, which deviates from the findings of Ariffin and Lim (2020) and suggests a potential generational shift in user priorities. Additionally, the research confirms a strong, positive correlation between perceived ease of use and perceived usefulness of e-wallets, aligning with Sinha et al. (2019). Students are drawn to e-wallets due to their intuitive interface and streamlined functionality. This focus on simplicity and efficiency caters to the preferences of young users who value a smooth and trouble-free payment experience.

As a result, the ease of use directly impacts their perception of the technology's overall usefulness. Moreover, perceived usefulness impacts attitude significantly, supporting the findings of Kustono et al. (2020). This finding suggests that users who perceive e-wallets as highly useful are likelier to have a positive attitude toward the technology. The benefits, such as quick transactions and cashless convenience, foster a cheerful disposition among university students. When students perceive e-wallets as valuable and practical tools, they are more likely to feel satisfied with their overall payment experiences. This positive relationship reinforces that users' satisfaction is closely linked to their perception of the technology's usefulness. Finally, this study confirms that user satisfaction significantly influences positive attitudes and intention to keep using e-wallets. This finding echoes prior studies by Foroughi et al. (2019), Rahi et al. (2021) and Shang & Wu (2017). When university students are satisfied with their e-wallet experiences, they are likelier to maintain a positive attitude towards the technology and exhibit a strong intention to continue using it. Satisfaction is key to cultivating favourable attitudes and fostering future usage intentions.

Contribution and Implications: This research contributes to the understanding of e-wallet adoption in two key ways. Firstly, it demonstrates the continued relevance of the TCT model in explaining young consumers' technology adoption behaviour. This reinforces the TCT's usefulness in understanding user continuance intentions within the context of e-wallets. Secondly, the study highlights the factors influencing university students' attitudes and intentions towards e-wallets. This knowledge is valuable for researchers exploring technology adoption among young demographics. Furthermore, from a policy perspective, this research suggests that promoting positive user experiences with e-wallets can encourage cashless transactions among young adults. This aligns with the government and Bank Negara Malaysia's initiatives to promote cashless societies. Universities can also leverage these findings to facilitate smoother payment processes by encouraging student e-wallet adoption.

5. Conclusion and Recommendations

This study achieved its research objective by providing valuable insights into the determinants of e-wallet payment usage among university students. The results indicate that all proposed hypotheses except one were not supported. The findings contribute to applying the TCT, particularly new knowledge within the context of e-wallet literature. Theoretical implications contribute to knowledge development, while the practical implications extend to consumers and the e-wallet industry, benefiting key players in this area. This research investigates the direct relationships between confirmation, perceived usefulness, perceived ease of use, satisfaction, and attitude toward the intention to continue using e-wallets. For a more comprehensive understanding, future studies could explore additional variables as moderating factors, such as gender, to ascertain whether different genders might impact the intention to continue using e-wallets. It should be noted that most of the research participants are from younger generations from public universities. Hence, the outcome can only be broadly generalised to some of the population. Moreover, it should be mentioned that this study employs a cross-sectional approach, meaning that data is collected only at one specific moment. A longitudinal study would be more beneficial given the study's emphasis on continuance intention. This way, changes in respondents' intentions can be observed, leading to more generalised results.

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Effectiveness of TikTok Marketing on Students' Purchase Intention Towards Fashion Products

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Abstract: Social media platforms have a significant function in enabling marketers to engage with their audience in the current digital environment. TikTok has gained immense popularity, particularly among Generation Z, and has emerged as an effective marketing instrument. The objective of this study is to investigate the usefulness of TikTok marketing in influencing students' inclination to purchase fashion items. The researchers employed a quantitative methodology to administer a survey utilizing a questionnaire that evaluated three distinct factors, namely promotion, video quality, and time consumption, which have an impact on purchase intentions. This study employed a probability sampling method, namely simple random sampling, to target a group of final-year students. The sample size consisted of 120 respondents. The data were examined via SPSS, highlighting the reliability of both the independent and dependent variables. The study employed analytical approaches, including reliability analysis and multiple regression analysis. Based on the results of this study, two hypotheses, namely promotion and time consumption, were found to be accepted, whereas one hypothesis, video quality, was found to be rejected. This report is an essential resource for online retailers and marketers as the fashion industry goes through a digital transition. It assists them in selecting efficient channels for advertising their fashionable goods. Businesses looking to engage with this group in the ever-changing digital ecosystem may find it helpful to understand how TikTok marketing influences students' purchasing preferences.

Keywords: *TikTok marketing, purchase intention, fashion products, promotion, video quality, time consumption.*

1. Introduction

The rapid growth of TikTok is undeniably remarkable, particularly when compared with the well-established social media giants such as Facebook and Instagram. TikTok's success has also been enhanced by its enthusiastic adoption of user-generated material. The platform promotes ingenuity and uniqueness, cultivating a lively community of content creators that provides a diverse array of engaging and educational videos. TikTok's adoption of a user-centric approach has facilitated the development of a dedicated and actively involved user community. Currently, there is intense competition among firms, particularly in the fashion industry, when it comes to marketing their products. For firms, the expense of marketing can vary significantly based on their specific target market. Consequently, numerous firms shifted to social media marketing as a result of the growing number of social media users from diverse backgrounds. Currently, short video advertisements are highly popular marketing content due to the preference of modern customers for viewing videos rather than reading (Adyantari, 2023). This implies that the effectiveness of TikTok marketing is enhanced by certain elements that influence students' intentions to purchase fashion products.

The utilization of social media platforms has shown significant expansion. Chaffey (2022) states that social media is used by 59% of the global population. According to Amri et al. (2023), the average daily duration of social media usage is 2 hours and 29 minutes. Individuals utilize social media platforms for interpersonal communication, whereas prominent businesses employ these platforms for promotional purposes (Jamil et al., 2022). Consequently, firms perceive these platforms as important instruments for flourishing in the digital environment (Ebrahim, 2020). Social media marketing, as described by Jamil et al. (2022), is the use of social media platforms to promote items and engage with potential customers to generate commercial success. Many organizations employ online marketing strategies, such as leveraging blogger endorsements, advertising on social media platforms, and monitoring user-generated material, to promote brand recognition among customers (Jamil et al., 2022). According to Kaihatu (2020), there is a correlation between internet users who

purchase 57% of fashion-related products online and their intention to make online purchases. This intention is influenced by their positive perception of content, price, and quality.

TikTok has accumulated over three billion downloads, with a user base of more than one billion active users each month. It currently ranks as the sixth-most-used platform globally. According to TikTok Shop Statistics and Shopping Trends in 2023, 55% of TikTok users have purchased after seeing a brand or product on the platform. Additionally, 50% of TikTok users have purchased after watching a TikTok Live, and 49% of TikTok users believe that the platform has helped them in making purchasing decisions (TikTok Shop Statistics and Shopping Trends in 2023, 2023). Simultaneously, TikTok enables consumers to engage with sellers by sending messages and tracking them. TikTok has the ability to efficiently assess the preferences of customers based on the videos they like and the duration of time they spend watching specific videos. Fashion products encompass any items that relate to the apparel and style sector. This can include a broad spectrum of objects, ranging from fundamental necessities such as socks to costly luxury goods like designer handbags and jewellery. All of these things are available for purchase on the TikTok Shop, and they can be bought by students or individuals of various age groups.

TikTok has popularized fashion video trends like clothes hauls and fashion tips, bringing them into the mainstream and increasing their accessibility and popularity. Fashion brands have found this to be an important development, as it offers a robust platform for staying up-to-date, surpassing competitors, and reaching new audiences. This has been particularly valuable during the COVID-19 pandemic when there was a significant increase in social media engagement. TikTok has emerged as a crucial arena for the fashion industry, as evidenced by the immense popularity of the hashtag #FashionTikTok, which has accumulated over 7 billion views. The platform has fostered a robust and ever-growing community of fashion enthusiasts (Pangalila and Aprilianty, 2022). This research aims to assess the success of social media marketing. The study aims to determine the effectiveness of TikTok marketing in influencing students' attitudes and behaviors toward fashion products. The research aims of this study are to identify the attributes that contribute to students' purchase intentions toward fashion products, as outlined below:
RO1: To determine a relationship between promotion, video quality and time consumption, and purchase intention of students.

2. Literature Review

Promotion: As to the findings of Rochman and Kusumawati (2023), promotion can be described as severely advertising one's products or services to the entire community. Businesses use it to attract attention, communicate their offerings, and persuade customers to make immediate purchases. It is observed to ignite interest and generate excitement about the options that are accessible. Promotions are temporary strategies employed to stimulate an enormous rise in sales volume during a specific timeframe (Mustikasari et al., 2023). Product advertising on TikTok often entails the publishing of videos ranging from 15 to 60 seconds in duration, which provide information about the highlighted products. Furthermore, when businesses choose to sell their products on TikTok, the platform frequently provides discounts to customers, increasing the efficacy of promotional endeavors while maintaining the profitability of the firm. The research conducted by Anwar and Hasbi (2023) has shown that the combination of marketing and discounts on TikTok has a substantial influence on purchase intention. Another method for promoting products on TikTok is by collaborating with "influencers," who are people with a large number of followers. Research performed by Nofela and Saputri (2022) has shown that utilizing social media marketing and influencer endorsements on TikTok can have a combined and partial impact on purchase intention, especially in the TikTok Shop context. The promotion of items has a substantial and beneficial impact on purchase intention, as evidenced by studies conducted by Refasa et al. (2023), Segarwati et al. (2023), Anwar and Hasbi (2023) and Sanjaya et al. (2023).
H1: *Promotion has a significant relationship with students' purchase intention towards fashion products.*

Video Quality: As shown in Dirir's (2022) study, TikTok translates its content into micro-works of art. TikTok allocates resources into acquiring top-notch cameras, lighting equipment, and even drones to capture visually striking imagery that immediately attracts viewers. Imagine captivating wide-angle views of landscapes or

detailed close-up photos of products that captivate and fascinate viewers. The quality of TikTok videos comprises multiple factors, including high resolution, the material illustrated, the shared information, and other relevant characteristics. Videos that generate a significant number of likes and comments are frequently indicative of superior quality. The study conducted by Tee et al. (2023) found a significant relationship between the desire to make impulse purchases on TikTok and criteria such as perceived enjoyment, perceived usefulness, visual appeal, and product feasibility. The purchasing intention is strongly and positively influenced by higher video quality, as demonstrated by studies conducted by Kristi and Aruan (2023) and Sandrina and Dirbawanto (2022). The relationship between entertainment and the formation of perceived advertising value can be better explained by a recent study. This study found that there is a positive correlation between entertainment and the development of perceived advertising value. The respondents in the study reported feeling entertained and enjoying viewing TikTok video ads (Dwinanda et al., 2022).
H2: *Video quality has a significant relationship with students' purchase intention towards fashion products.*

Time Consumption: (Yang, 2020) observed that TikTok gained immense popularity in 2017, rapidly becoming one of the most widely downloaded applications worldwide. However, the influence is not limited to the entire globe. In the United States, it has particularly fascinated a specific demographic: Gen Z, aged 16–24, comprises 60% of the active user base. These users access the app a remarkable eight times every day, devoting an average of 46 minutes to engaging in the fascinating content of TikTok. A study conducted by Goel and Diwan (2022) found that social media has a substantial impact on consumer buying behavior, particularly due to the growth of online shopping and the rising amount of time individuals spend on social media platforms. TikTok, specifically, tends to need a greater amount of users' attention in comparison to other social media sites. With the heightened level of user interaction, there is a greater chance for TikTok users to encounter advertised products when exploring the platform. Moreover, a study performed by Qin et al. (2023) emphasized that TikTok addiction is determined by users' cognitive attention towards the platform and its content. There is a weak connection between time and the likelihood of making a purchase (Zhang et al., 2023). Based on this study, there is no direct and positive correlation between the amount of time spent and the intention to make a purchase. In contrast, a recent study conducted by Goel and Diwan (2022) found that social media has a significant impact on consumer purchasing behavior due to the rise in online shopping and the amount of time individuals spend on social media platforms.
H3: *Time consumption has a significant relationship with students' purchase intention towards fashion products.*

3. Methodology

The target population is undergraduate students located at public universities in Malaysia. The population of this study is unknown due to the lack of information regarding the users of TikTok among this targeted group. Hence, purposive sampling was selected, and 120 respondents were obtained, these respondents represent all-level business and management students at their universities. The current study comprises four main variables: promotion, video quality, time consumption, and the student's purchase intention towards fashion products. The items were adopted from the previous studies, especially those closely related to organizational contexts, and all the variables were measured using the five-point Likert scale. The data were examined via SPSS, employing analytical approaches including reliability analysis and multiple regression analysis to test the relationship between each variable.

4. Findings

Cronbach's alpha was carried out, and as shown in Table 1, the alpha value (α) for all items was above 0.6. Therefore, it can be concluded that the items applied in this study were valid and reliable. Due to the α value being close to 1, it can be considered that the variables used have a high level of reliability. Next, Table 2 shows the breakdown of the respondents by gender, age group, main purpose for having a TikTok account, time spent on TikTok, and whether they purchased any products from TikTok. The majority of respondents were female, and mostly they were between 22 and 25 years old, with 78.3%. As for the main purpose of having a TikTok account, entertainment indicated a high percentage at 75%, followed by socializing at 20%. As for time

consumption, the majority of students spend about 2 to 5 hours, with 57.5% of students having experience buying products using TikTok.

Table 1: Reliability Analysis

Variable	Number of Items	Cronbach's Alpha
Promotion	6	0.804
Video quality	6	0.810
Time consumption	6	0.809
Student's purchase intention	6	0.872

Table 2: Respondents Profile

Criteria	Category	Number	Percentage
Gender	Male	28	23.3
	Female	92	76.7
Age Group	19-21	25	20.8
	22-25	94	78.3
	26-29	1	0.80
What is your main purpose for having a TikTok account?	Socialize	24	20.0
	Academic	3	2.5
	Business	3	2.5
	Entertainment	90	75.0
How much time do you spend on TikTok?	Less than 1 hour	28	23.3
	2 to 5 hours	69	57.5
	More than 5 hours	23	19.2
Have you ever purchased any products from TikTok?	Yes	120	100
	No	0	0

Table 3: Result of Multiple Regression

Dependent Variable: Student's purchase intention		
Independent Variables	**Standardized Coefficient (BETA)**	**Sig.**
(Constant)		
Promotion	0.296	0.001
Video quality	0.109	0.237
Time consumption	0.467	<0.001
F value	65.219	
R square	0.628	

5. Conclusion and Discussion

According to the information provided in Table 3, the variable that does not have a significant relationship is video quality. This is indicated by its significant value of 0.237, which is more than the threshold of 0.05. This finding aligns with the research conducted by Araujo et al. (2022), which revealed that video quality is not a key factor affecting people's purchase intentions. This demonstrates the considerable variability in individual tastes for video content. While certain clients may value superior visual elements, others may prioritize comprehensive product information or interactive functionalities. Furthermore, this could be related to the significance of the content. The significance of the content's alignment with the viewer's interests and requirements is crucial. Despite substandard video quality, if the material strikes an emotional connection with the viewer and highlights things that stimulate their interest, it can still have an impact on their intention to

make a purchase. Furthermore, the phenomenon of social proof, exemplified by the number of likes, comments, and shares, could have an impact on the desire to make a purchase.

A video that has high levels of engagement indicates to viewers that the product is appealing, which can influence their choice to purchase it without considering the quality of the video. Furthermore, the findings indicate an important relationship between promotional activities, the amount of time spent, and students' tendency to purchase fashion-related products. These relationships are statistically significant, with p-values of 0.001. This highlights the significance of innovative promotional strategies in shaping customer buying behavior in the digital age. Promoting products in TikTok shops can significantly impact consumers' intentions to make a purchase, particularly for fashion items, given various important factors. For instance, fashion products mainly depend on visual attractiveness, and TikTok is a predominantly visual medium. Promotional videos can exhibit apparel, accessories, and other fashion goods being used, enabling users to visually perceive their appearance and visualize how they might integrate into their personal style. Furthermore, TikTok is renowned for its influential culture, in which viewers frequently look for inspiration from producers regarding the most recent fashion trends.

Promotional content disseminated by influencers or businesses can rapidly gain popularity and establish trends within the TikTok community, gaining influence over the audience's spending habits as they attempt to remain up-to-date and stylish. Furthermore, when comparing the two predictors that showed significance, it is evident that time consumption is the main factor that affects a student's intention to purchase fashion products; hence, this finding could contribute to the existing body of knowledge. This is supported by the fact that this predictor has a greater beta value (0.467) in comparison to the other predictors. Additional proof of TikTok's efficacy in shaping consumer purchasing behavior arises from the relationship between the overall duration of content consumption and subsequent purchases. TikTok shops provide users with a smooth and effortless browsing experience, enabling them to rapidly navigate through a diverse range of stylish products. As users spend more time exploring various things, their chances of encountering items that attract their attention and generate interest increase, ultimately resulting in a greater desire to make a purchase. Another possible contributing element to this circumstance could be influencer endorsements. A wide range of influencers and content creators on TikTok engage in collaborations with brands to promote fashion products to viewers.

The impact of influencer endorsements can improve users' confidence in products and influence their intention to purchase when they spend time watching content from trustworthy influencers. Going forward, a longitudinal study would allow researchers to track variations in TikTok marketing efficacy over time. This approach can detect evolving trends while evaluating the practicality of marketing initiatives, providing insights into how these aspects will impact students' future purchasing intentions. In light of the ever-changing landscape of social media and fashion trends, researchers must employ real-time approaches for gathering information. This entails monitoring and evaluating existing marketing techniques and trends to ensure that the study remains relevant and current in a constantly changing market. Ultimately, additional investigation could assess the efficacy of marketing strategies on various social media platforms to enhance understanding of students' online behaviors. By comparing TikTok to different platforms, one can identify connections or variations in how promotional techniques impact the buying patterns of students.

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A Conceptual Model for Safety Management Systems (SMS) Practices among Employees in the Manufacturing Industry

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Abstract: The burgeoning manufacturing sector has been the primary driver of Malaysia's substantial and notable economic expansion. Notwithstanding these, the Malaysian manufacturing sector remains afflicted by concerning safety concerns. To enhance the situation, the Malaysian government has proposed the use of self-regulatory safety management systems (SMS). However, there are doubts about the employees' preparedness to adopt this measure. Implementing SMS has numerous complexities. Despite progress made in the SMS technique, failures continue to be prevalent. There is a lack of literature regarding the perspectives of the manufacturing industry regarding their concerns regarding the implementation of SMS. This study aimed to ascertain the presence of safety practices derived from SMS elements and identify the characteristics associated with the successful application of SMS. The anticipation is that the outcomes of this study will contribute to the successful implementation of SMS. The findings of this research will be of significant importance to the stakeholders and policymakers.

Keywords: *Conceptual Model, Safety Management Systems (SMS), Employees, Manufacturing Industry.*

1. Introduction and Background

In the contemporary era, Malaysia's economic landscape has experienced substantial and rapid growth, largely driven by the burgeoning manufacturing industry. This sector plays a pivotal role in propelling economic development, making significant contributions to Malaysia's Gross Domestic Product (GDP) and employment rates (Lim, 2022). However, amidst its economic prowess, the industry grapples with persistent safety challenges, posing threats to the well-being of its workforce. Despite numerous regulatory efforts and safety initiatives, the manufacturing industry in Malaysia continues to be plagued by alarming safety issues. The sector's contribution to the country's high fatal accident rate remains a matter of concern, underscoring a pressing need for more effective safety management strategies (DOSH, 2023). The Department of Occupational Safety and Health (DOSH) underscores this reality, as illustrated by Figure 1, depicting the sobering statistics of workplace accidents within the manufacturing domain.

Figure 1: Fatal Occupational Accidents by Sector in 2022

SECTOR	NPD	PD	DEATH	TOTAL
Hotel and Restaurant	118	1	0	119
Utilities (Electricity, Gas, Water and Sanitary Service)	178	2	9	189
Finance, Insurance, Real Estate and Business Services	345	4	24	373
Construction	87	2	59	148
Transport, Storage and Communication	234	4	10	248
Manufacturing	4273	183	58	4514
Wholesale and Retail Trade	114	3	2	119
Public Services and Statutory Authorities	74	3	0	77
Mining and Quarrying	27	2	8	37
Agriculture, Forestry and Fishery	856	23	16	895
TOTAL	6306	227	186	6719

Within the manufacturing sector, workers face a myriad of hazards ranging from machinery accidents to exposure to toxic substances. The fast-paced nature of production lines and the pressure to meet tight deadlines can further exacerbate these risks, leading to increased incidents of workplace injuries and fatalities.

Despite advancements in technology and automation, human error remains a significant factor contributing to safety incidents, highlighting the importance of comprehensive safety training and awareness programs. Some recent examples of fatal accidents involving employees are shown in Table 1.

Table 1: Recent Examples of Accidents Involving Employees (DOSH, 2023b)

No.	Date/location	Incident	Consequences
1.	16/06/23 Kuala Lumpur	Experienced a sudden and intense fire while lifting a stainless-steel container that contained the chemical hexane.	1 fatality
2.	15/06/23 Perak	The mixer machine, which was undergoing a cleaning process, abruptly commenced operation, leading to the victim becoming ensnared within the apparatus.	1 fatality
3.	30/05/23 Kelantan	The individual experienced a collision with a mobile beam loader while completing the task of fastening a T-beam onto the beam loader.	1 fatality
4.	11/05/23 Sabah	An air compressor equipment was used to inflate the shovel tyre, resulting in an explosion that caused the tyre rim ring to collide with the victim.	1 fatality
5.	20/04/23 Johor	The roll of tissue was hurled down when the wire rope of the overhead travelling crane (OTC) split during lifting operations, causing it to be struck by an iron holding.	1 fatality
6.	12/04/23 Sarawak	The individual was impacted by a fractured wire rope sling while performing the task of relocating a vessel from the river.	1 fatality

Against this backdrop, there is a compelling imperative to explore and understand the underlying factors contributing to safety lapses within the manufacturing sector. One crucial aspect deserving scholarly attention is the implementation and adherence to Safety Management Systems (SMS) among employees. SMS practices encompass a range of organizational policies, procedures, and protocols designed to mitigate workplace hazards and promote a culture of safety (Hale et al., 2021). However, despite the recognized importance of SMS practices, there remains a gap in the literature concerning the factors influencing their adoption and effectiveness within the manufacturing context. Hence, this study aims to address this gap by developing a comprehensive conceptual framework that elucidates the dynamics of SMS practices among employees in the manufacturing industry. By integrating theoretical insights and empirical evidence, this framework will provide valuable insights into enhancing safety performance and mitigating occupational risks in manufacturing environments (Tewari & Paiva, 2022).

2. Literature Review

Safety Management System: Ladewski and Al-Bayati (2019) claim that safety management methods encompass the various tasks employed to effectively oversee and regulate occupational health and safety performance inside an organization. Nevertheless, there has been an increased focus on safety management to mitigate the occurrence of accidents and injuries (Haslinda et al., 2016). Dyjack et al. (1998) assert that safety management has transitioned into its third phase after 1991. The United States of America (USA) implemented safety management, and Henrich was the first to conduct workplace safety audits to examine safety regulations and practices (Gilkey et al., 2003). Vinodkumar and Bhasi (2010) conducted a comprehensive analysis of several endeavors aimed at forecasting safety management techniques. However, it is important to only incorporate methods that are widely recognized as creating a safe atmosphere for both employees and employers (Razali et al., 2018). Nevertheless, prior research has indicated that organizations exhibiting accident rates and injury ratios are distinguished by factors such as staff safety training, management commitment to safety, and adherence to safety laws and procedures (Razali et al., 2018; Lee, 2018; Vinodkumar and Bhasi, 2010). According to Lee (2018), safety training, worker involvement, and management commitment are crucial factors in ensuring safety.

Hale and Borys (2013) and Ros and Gustafson (2015) assert that safety standards and feedback are key components of safety management, serving as a means to address management's dedication to ensuring safety inside the organization. According to Dov's (2008) study on safety atmosphere investigation, it was determined that the commitment of management to safety plays a significant influence in sustaining the safety performance of an organization. According to Fruhen et al. (2019), employees must exhibit adherence to safety regulations and procedures to exhibit proper safety behavior. Therefore, management must demonstrate a tangible commitment to safety to uphold safety performance (Lee, 2018). According to Mazzetti et al. (2020), it is imperative for personnel inside the organization to actively engage in occupational health and safety training programs. Furthermore, it has been seen that safety training enhances the knowledge and skills of employees in recognizing potential risks within the workplace (Teo et al., 2020). Furthermore, safety training plays a crucial role in reducing the likelihood of accidents and implementing appropriate safety measures to prevent workplace mishaps (Fruhen et al., 2019). Previous research has indicated that organizations characterized by a low incidence of accidents and injuries tend to possess robust safety training programs (Razali et al., 2018).

Vinodkumar and Bhasi (2010) argue that the implementation of systematic safety training programs is vital for organizations to enhance the health and safety standards of their personnel. Hence, safety training is widely recognized as a crucial component of safety management for recently hired personnel. This training encompasses many activities such as orientation sessions, buddy practice, and emergency action training practice, all aimed at enhancing occupational health and safety performance (Mearns et al., 2003). Effective management practices for enhancing workplace health and safety performance include regular communication between supervisors and the workforce (Kim and Scott, 2019). Previous research has indicated that safety performance is influenced by communication levels among management, supervisors, and coworkers, as evidenced by surveys conducted across different employee groups (Mukherji and Arora, 2017). Managers convey the actions that employees can and cannot take to uphold workplace safety (Reason et al., 1998). Therefore, it can be inferred that organizations that place a high priority on updating safety regulations and procedures demonstrate a commitment to minimizing the occurrence of accidents and injuries (Hale and Borys, 2013). Moreover, there exists a correlation between safety regulations and procedures and the incidence of accidents and injuries, as indicated by past research findings. However, according to Ajmal et al. (2020), incentives and incentive methods are deemed acceptable in overall quality management models to motivate personnel to operate safely inside the organization.

SMS Implementation and the Environment: Efficient execution is vital for every organization. Resource allocation and organizational structure adjustment are integral components of this process. Implementing plans is a difficult task, and more than 50% of the strategies devised by organizations are never executed (Mintzberg, 1994). The implementation process frequently encounters challenges stemming from factors such as stakeholder disengagement, insufficient awareness from upper-level management, ambiguous task definition, inadequate communication, limited understanding of progress, impatience, and a dearth of incentives (Tawse and Tabesh, 2021). The objective of this study is to examine the implementation of SMS (Strategic Management Systems) within organizations, drawing on the principles of contingency theory. The contingency hypothesis posits that there is no universally optimal approach to corporate organization, leadership, or decision-making. Contingency theory aims to identify the most effective kinds of control in various operating settings and explains the functioning of organizational control systems. Dealing with ambiguity is a key concern in this approach. The organization experiences uncertainty as a result of both its internal and external surroundings (Duncan, 1972). According to Duncan (1972), the external environment encompasses the pertinent physical and social aspects that exist beyond the confines of the organization or specialized decision unit and are immediately taken into account. According to Duncan (1972), Table 2 is a compilation of external environmental elements.

Table 2: Organizational External Environment (Duncan, 1972)

Key Area	Activities
Client Component	● Distributors of products or services ● Actual users of product or service
Suppliers Component	● New materials suppliers ● Equipment suppliers ● Product part suppliers ● Labor supply
Competitor Component	● Competitors for suppliers ● Competitors for clients
Socio-Political Component	● Government regulatory control over the industry ● National and local culture
Technological Component	● Meeting new technological requirements of own industry and related industries in the production of product or service ● New technological advances in the industry
Physical Factors	● Working location ● Weather/climate

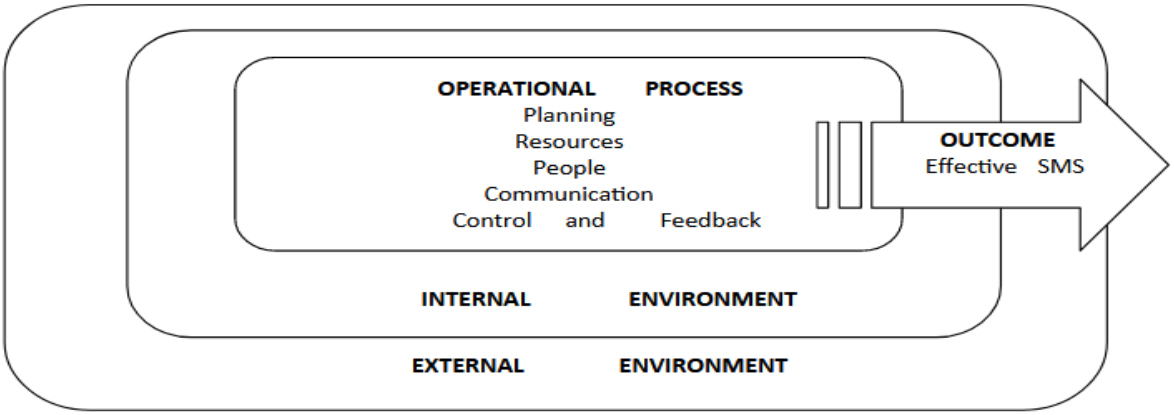
According to Mason (2007), organizations are perceived as open systems that engage in continuous interactions with their external circumstances. The external environment of an organization encompasses a comprehensive range of knowledge and information that must be assimilated and acted upon by its members to effectively accomplish the organization's objectives. According to Duncan (1972), the internal environment encompasses the pertinent physical and social elements that are situated within the confines of an organization or a single decision unit. These components are directly considered by individuals when making decisions within that system. Table 3 presents a compilation of instances pertaining to the internal environment as outlined by Duncan (1972).

Table 3: Organizational Internal Environment (Duncan, 1972)

Key Area	Activities
Organizational Component **Personnel**	● Educational and technological background and skills ● Previous technological and managerial skills ● Individual member's involvement and commitment to attaining the system's goals. ● Interpersonal behavior styles ● Availability of manpower for utilization within the system
Organizational Component **Structural**	● Characteristics of sub-units ● Interdependence of sub-units in carrying out their objectives ● Intra-unit conflict among organizational functional and staff units
Organizational Characteristics Component	● Organizational objectives and goals ● Integrative process integrating individuals and groups into contributing maximally to attaining organizational goals. ● Nature of the organization's product service

The basic theme of contingency theory is that organizations have to deal with different situations in different ways. There is no single best way of management applicable to all situations. To be effective, the internal functioning of an organization should co-relate with the demands of the external environment. In addition, contingency theory has been seen as an appropriate approach to cope with the SMS implementation of employees due to the different characteristics of manufacturing companies, as described by Tenhiälä, (2009) and Vogel & Lasch (2016). Moreover, current industry practice needs a systemic implementation strategy, as suggested by Santos-Reyes and Beard (2008) and Khan et al. (2023). This is the underlying reason for bringing contingency theory into this research so that the impact of the internal and external environment of the organization can be easily determined.

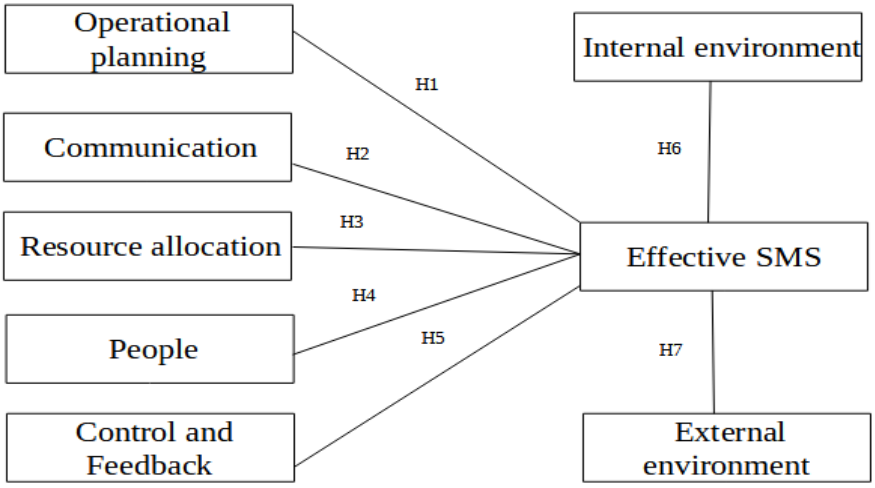
Figure 2: A Contingency Approach to Effective SMS (Okumus, 2003)



3. Conceptual Model of Purchase Intention of Cosmetic Products

For the purpose of this research, a framework from Okumus (2003), shown in Figure 2, was adapted as a basis. Okumus (2003) introduced a framework for strategy implementation, where there should be continuous interactions among the variables that make implementation possible. Seven important key variables chosen by Okumus (2003) are the internal environment, external environment, operational planning, communication, resource allocation, people, control and feedback. To achieve organizational effectiveness, the management system has to be appropriate for or 'fit' its environment and task (Okumus, 2003).

Figure 3: Conceptual Model for Safety Management Systems (SMS) Practices Among Employees in the Manufacturing Industry (Okumus, 2003)



4. Conclusion

In conclusion, this study has provided valuable insights into the dynamics of Safety Management Systems (SMS) practices among employees in the manufacturing industry in Malaysia. Through a comprehensive examination of relevant literature and theoretical frameworks, key determinants and moderators shaping the implementation and efficacy of SMS practices have been identified. The manufacturing sector in Malaysia, despite its significant contribution to economic development, continues to face serious safety challenges as evidenced by the high fatal accident rate. The findings underscore the critical need for more effective safety management strategies to safeguard the well-being of the workforce and mitigate occupational risks. By integrating theoretical insights from various disciplines such as human resource management, organizational

behavior, and occupational health and safety, this study has developed a robust conceptual framework for understanding SMS practices within manufacturing settings. This framework emphasizes the multi-dimensional nature of safety management, encompassing organizational, individual, and contextual factors. Furthermore, the study highlights the importance of fostering a safety culture within manufacturing organizations, wherein safety is prioritized at all levels and embedded in organizational norms and practices. Effective leadership, employee involvement, training and education, and continuous improvement initiatives emerge as key enablers of successful SMS implementation.

Policy Implications: The insights generated from this study have practical implications for policymakers, industry stakeholders, and organizational leaders in formulating targeted interventions and strategies to enhance safety culture and reduce occupational hazards within the manufacturing sector. By addressing the identified gaps and challenges, manufacturing organizations can create safer work environments, thereby protecting the well-being of their employees and sustaining their contribution to Malaysia's economic prosperity. In summary, this study contributes to the existing body of knowledge on safety management in the manufacturing industry and lays the foundation for future research endeavors aimed at further understanding and enhancing SMS practices for the benefit of employees, organizations, and society as a whole.

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Enhancing Supply Chain Efficiency: Implementation of Vendor Managed Inventory in Inventory Routing Problem

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Abstract: This article explores the integration of Vendor Managed Inventory (VMI) into the framework of the Inventory Routing Problem (IRP) as a strategic approach to enhance supply chain efficiency. VMI involves suppliers taking an active role in managing customer inventory levels and fostering real-time communication and data sharing. The Inventory Routing Problem addresses the challenge of optimizing delivery routes while simultaneously managing inventory levels. The benefits of implementing VMI in IRP include improved demand forecasting, reduced stockouts and overstock situations, and optimized routing and transportation. The study applies a method that strategically integrates Vendor Managed Inventory (VMI) into the Inventory Routing Problem (IRP) framework, utilizing real-time data sharing and optimized routing algorithms to enhance supply chain efficiency. This approach is evaluated through research findings highlighting its benefits and implementation challenges. Thus, we discuss the potential advantages and challenges associated with this integration. While VMI in IRP offers substantial benefits, data security, cultural shifts, and IT system integration must be addressed for successful implementation. This article provides insights into the promising synergy between VMI and IRP, offering organizations a competitive edge in the dynamic supply chain management landscape.

Keywords: *Vendor-managed inventory, inventory routing problem, supply chain efficiency, optimization*

1. Introduction

In supply chain management, companies always seek new ways to improve inventory and operations(Panfilova et al., 2020). One approach that's becoming more popular lately is combining Vendor Managed Inventory (VMI) with the Inventory Routing Problem (IRP). VMI, a collaborative approach, entails suppliers taking an active and responsible role in managing the inventory levels of their customers (Karimi et al., 2022). This helps make sure supplies are always replenished smoothly and reduces the chance of running out of stock.

The contemporary supply chain environment is marked by increased complexities and challenges, including global market dynamics, technological advancements, and changing consumer expectations (Akindote, 2023). In response to these challenges, the strategic implementation of VMI in conjunction with the IRP presents an opportunity for organizations to address critical aspects of their supply chain dynamics. This article explores how VMI and IRP work together, discussing their benefits and challenges.

The integration of VMI and IRP represents a forward-thinking approach to supply chain optimization (de Maio & Laganà, 2020). VMI, by design, enhances collaboration and communication between suppliers and customers, fostering a proactive stance in inventory management. The significance of this integration lies in its ability to provide a holistic solution that not only optimizes inventory processes but also addresses the complexities inherent in routing goods to customers efficiently.

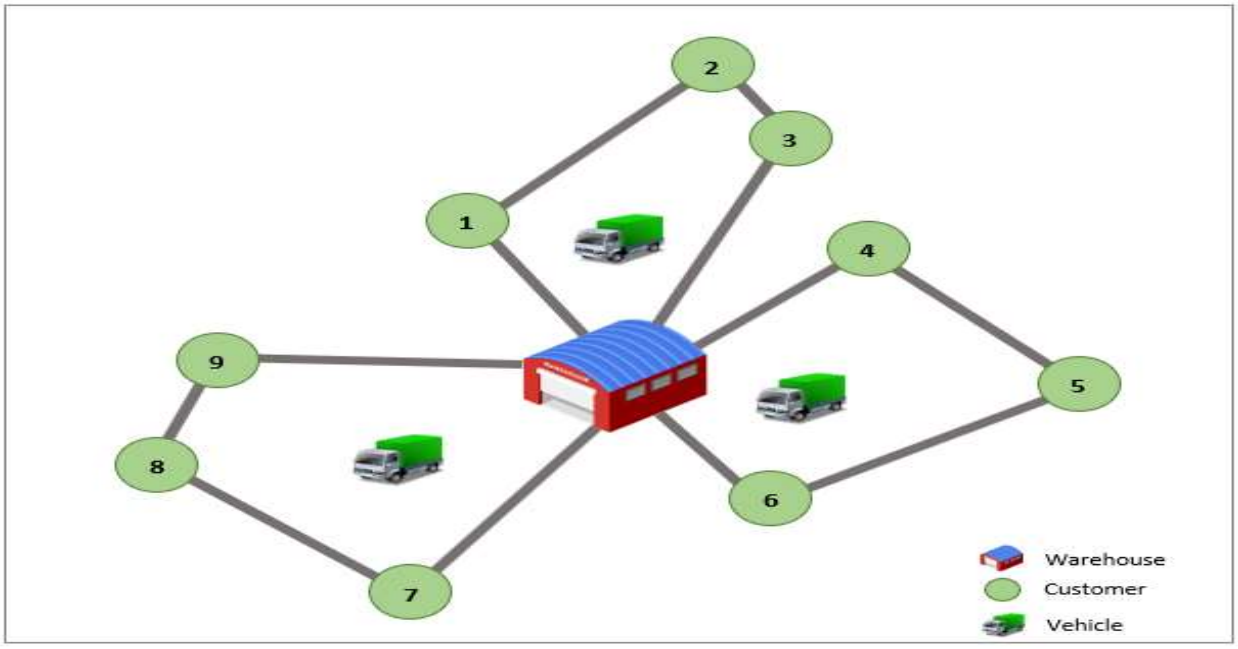
The proactive nature of VMI aligns seamlessly with the objectives of the IRP, which inherently deals with the optimization of delivery routes while simultaneously managing inventory levels. According to (Bardeji et al., 2022). By allowing suppliers to actively participate in inventory replenishment based on real-time data, organizations can benefit from enhanced demand forecasting accuracy, reduced stockouts, and improved overall efficiency.

The integration of VMI and IRP is not merely a theoretical concept but a practical solution that has demonstrated tangible benefits in various studies. Organizations that implement VMI within the context of IRP experienced a significant reduction in transportation costs and a marked improvement in route optimization

(Soysal et al., 2023). These findings highlight the practical implications of integrating VMI into the IRP framework and underscore its potential to bring about positive transformations in the logistics and supply chain domains.

However, as organizations consider embracing this integrated approach, it is crucial to acknowledge and address the challenges that may arise. The shift towards VMI in IRP involves not only technological considerations but also cultural shifts and changes in traditional business practices. The insights gained from this exploration will offer valuable guidance to organizations contemplating the adoption of VMI in IRP, providing a wide and challenges associated with this strategic integration.

Figure 1: The Illustration Scenario for Inventory Routing Problem (IRP)



2. Literature Review

Vendor-Managed Inventory: Nowadays, many companies are looking into using a method called vendor-managed inventory (VMI) to make their supply chains work better (Harahap & Rahim, 2017). Vendor Managed Inventory is a supply chain collaboration model in which suppliers monitor and manage inventory levels on behalf of their customers. This approach involves real-time communication, data sharing, and mutual trust between the vendor and the customer. The goal is to streamline the replenishment process, reduce stockouts and overstock situations, and improve overall supply chain performance. (Kamarul et al., 2017). They figure out how much is needed and when to deliver it to meet customer needs. Customers don't have to worry about managing stock or when deliveries come (Rodrigues et al., 2019).

After seeing the success of big retailers like Walmart using VMI, many other companies are trying it too (Kamarul et al., 2017; Guimarães et al., 2019). Before, production and transportation decisions were made separately, but connecting them can make companies work better (Yadollahi et al., 2019). The amount needed is based on inventory information to estimate what customers need and manage transportation well (Tirkolaee et al., 2021). This helps both suppliers and customers in managing their activities.

VMI focuses on coordinating inventory and transportation, but it doesn't always go well. Problems can arise from wrong data like customer order times and supplier decision-making (Zhong & Aghezzaf, 2012; Mohammad, 2019). With a lot of data, it's hard to make everything work smoothly. One big challenge with VMI is figuring out the best routes for delivering products from suppliers to retailers to cut down on costs, known as the inventory routing problem (IRP).

The Inventory Routing Problem: The Inventory Routing Problem is a well-known optimization challenge in logistics and supply chain management. It involves determining the optimal routes for vehicles delivering goods to customers while simultaneously managing inventory levels. The integration of VMI into the IRP framework introduces a proactive approach to inventory control, as the supplier gains visibility into customer demand patterns and takes an active role in managing inventory replenishment (Rohmer et al., 2019). The function of IRP is to manage these three important items, which are inventory, vehicle routing, and delivery planning routes (Rahim et al., 2017).

To solve the IRP, a solution to a difficult mathematical problem must be developed. According to the earliest study by Bell et al. (1983), inventory planning and vehicle scheduling have a fluctuating adaptation of IRP. To solve the IRP, a lot of methodologies and algorithms have been proposed. For example, when customer demand is faced as deterministic or stochastic, or when customer demand is expected to be deterministic or stochastic, a distinctive model can be developed (Kamarul et al., 2014).

3. Methodology

To begin, the IRP model is introduced, including the parameters and the variables that are used to solve the inventory routing problem. There are limitations in developing the IRP model, some assumptions must be made. The following are some of them:

- Customer demand must be known in advance with the right amount.
- The vehicle's capacity must be set enough to deliver the customer's requirement.
- The cost of transportation must be proportional to vehicle travel times.
- Only a fleet of homogeneous vehicles is used to replenish the customers
- Split delivery is not allowed in the model

Table 1 shows the parameters and variables used to solve the IRP:

Table 1: The Parameters and Variables Descriptions

Indices	
$T = 1, 2, \ldots, T$	**Period index**
$W = 0$	**Depot/warehouse**
$S = 1, 2, \ldots, N$	**a set of customers (customer *i* demand inventory *j*)**
Parameter	
φ_{jt}	The delivery handling fixed cost at location $j \in S^+$ (customers and warehouse) in period $t \in H$.
n_{jt}	The inventory holding cost per unit per period at location $j \in S^+$ (in RM per ton per period)
ψ^v	The vehicle operating fixed cost $v \in V$ (in RM per vehicle)
δ_v	The vehicle traveling cots $v \in V$ (in RM per kilometer)
k^v	The vehicle capacity $v \in V$ (in kg)
v_v	The vehicle's average speed $v \in V$ (in kilometers per hour)
θ_{ij}	The trip duration from a customer $i \in S^+$ to customer $j \in S^+$ (an hour)
d_{jt}	The demand rate at customer j faced deterministic (in kg per hour) in period $t \in H$
I_{j0}	The initial level of inventory at each customer (in tons) $j \in S$
Variables	
Q_{ijt}^v	The inventory quantity remaining in the vehicle (in location $j \in S^+$ from location $i \in S^+$ in a period $t \in H$. hen th trip (i, j), the quantity equals zero and there is no vehicle $v \in V$ in period t
q_{jt}	The delivered quantity (in tons) to a location $j \in S$ in period $t \in H$, and 0
I_{jt}	The inventory level at a location (customers and warehouse) $j \in S^+$ at the end of period $t \in H$ (in kg)
x_{ijt}^v	A binary variable is set to 1 if the location $j \in S^+$ i ed after delivering location $i \in S^+$ using a vehicle $v \in V$ in period $t \in H$, and 0.
y_t^v	A binary variable is set to 1 if the vehicle $v \in V$ is used in periods t, and 0.

4. The Benefits of Implementing VMI in IRP

The benefits of solving IRP with the implementation of VMI policy are the ideal solution. With an integrated VMI policy, IRP is solved to find the optimal solution where the final inventory level at each customer is zero, leading to a smaller total quantity distributed. This integration under VMI ensures more efficient use of resources, reduced distribution quantities, and better overall inventory management (Archetti & Speranza, 2016). Additionally, we proposed the benefits of implementing the VMI in IRP.

Table 2: The Benefits of VMI In IRP

Aspects	Description
Improved Demand Forecasting	VMI allows suppliers to access real-time data on customer demand, enabling more accurate forecasting. This helps in optimizing inventory levels and ensures that the right amount of stock is delivered at the right time. VMI improves demand forecasting accuracy which achieves a reduction in excess inventory costs (Karimi et al., 2022).
Reduced Stockouts and Overstock	By having a proactive approach to inventory management, VMI minimizes the likelihood of stockouts and overstock situations. This leads to improved customer satisfaction and operational efficiency. (Bardeji et al., 2022) indicates that implementing VMI in IRP reduces stockouts and overstock situations, leading to improvement in overall supply chain performance.
Optimized Routing and Transportation	Integrating VMI into IRP allows for better coordination of delivery routes based on real-time inventory data. This leads to more efficient transportation planning and cost savings. VMI implementation in IRP results in improving route optimization" (Zhong & Aghezzaf, 2012).
Enhanced Customer Satisfaction and Operational Efficiency	Beyond the quantitative metrics, the proactive approach inherent in VMI not only reduces stock-related disruptions but also contributes to improved customer satisfaction and operational efficiency. These aspects, though challenging to quantify precisely, play a pivotal role in shaping a positive and resilient supply chain ecosystem (Ibrahim et al., 2023).
Strategic Supplier-Customer Collaboration	The integration of VMI in IRP fosters a strategic collaboration between suppliers and customers. By aligning objectives and sharing responsibilities, both parties can work synergistically to achieve common supply chain goals (Aloui et al., 2021).
Flexibility and Responsiveness	VMI provides a flexible and responsive approach to inventory management, allowing for quick adjustments in response to changing market conditions or unexpected disruptions (Upadhyay et al., 2013).
Cost-Efficient Inventory Holding	Through improved demand visibility, VMI in IRP enables organizations to optimize inventory holding, reducing carrying costs and improving capital efficiency (Huang & Lin, 2010).
Environmental Sustainability	The optimization of delivery routes facilitated by VMI in IRP not only contributes to cost savings but also aligns with sustainability goals by reducing carbon emissions associated with transportation (Jabir et al., 2015).
Strategic IT Integration	Successful implementation of VMI in IRP necessitates robust IT integration. Organizations investing in advanced IT systems experience enhanced efficiency and effectiveness in managing real-time data for improved decision-making (Barbosa-Povoa & Pinto, 2020).
Continuous Improvement	Organizations embracing VMI in IRP are positioned for continuous improvement. The feedback loop established through real-time data sharing allows for iterative enhancements in inventory processes and routing strategies (Schuster Puga & Tancrez, 2017).

In essence, the implementation of VMI within the context of the IRP not only presents a strategic solution to immediate supply chain challenges but also establishes a foundation for continuous improvement, collaborative relationships, and sustainable business practices.

5. Challenges and Considerations

While the integration of Vendor Managed Inventory (VMI) into the Inventory Routing Problem (IRP) presents a promising solution for enhancing supply chain efficiency, several challenges and considerations demand careful attention to ensure the success of this strategic collaboration. Data Security and Privacy: The sharing of real-time inventory data between suppliers and customers is a cornerstone of VMI in IRP, yet it raises critical concerns regarding data security and privacy. Establishing robust communication protocols and secure data-sharing mechanisms is crucial. Organizations must invest in state-of-the-art encryption technologies and authentication methods to safeguard sensitive information.

Cultural Shift and Collaboration: One of the primary challenges in implementing VMI in the context of IRP lies in the necessity for a significant cultural shift. Traditionally, the relationship between suppliers and customers has been transactional. However, the success of VMI hinges on building a collaborative and trust-based relationship. Organizations need to invest in change management initiatives to facilitate this cultural transformation. Training programs, workshops, and communication strategies are essential to align the mindset of both suppliers and customers with the collaborative nature of VMI-IRP integration. Success in this area is crucial for unlocking the full potential of VMI in optimizing supply chain processes

Integration with IT Systems: The seamless integration of VMI into existing information technology systems is a critical factor in the success of the integration. Compatibility issues and system upgrades may be necessary to ensure smooth data exchange and communication between suppliers and customers. Organizations need to assess the capabilities of their current IT infrastructure, identifying gaps and areas requiring enhancement. Investment in advanced technologies, such as cloud-based solutions or IoT (Internet of Things) devices, may be necessary to facilitate real-time data sharing. Additionally, collaboration between IT departments of both suppliers and customers is vital to address integration challenges and ensure a cohesive and interoperable IT ecosystem.

a) Cost Implications

While the benefits of VMI in IRP are substantial, organizations must carefully consider the associated costs. This includes not only the initial investment in technology and infrastructure but also ongoing maintenance and training expenses. A comprehensive cost-benefit analysis should be conducted to evaluate the long-term financial implications of VMI-IRP integration. Organizations need to weigh the potential improvements in efficiency against the upfront and ongoing costs to ensure a favorable return on investment.

b) Resistance to Change

Resistance to change is a common challenge in any organizational transformation. Employees at various levels may resist adopting new processes and technologies associated with VMI in IRP. recommend implementing change management strategies to address resistance, including clear communication, stakeholder engagement, and showcasing the benefits of the integration. Employee training programs can also play a crucial role in facilitating a smooth transition.

While the benefits of VMI in the context of IRP are compelling, addressing these challenges and considerations is crucial for a successful implementation. Organizations that proactively manage these aspects stand to gain not only in terms of operational efficiency but also in building resilient and collaborative supply chain ecosystems for the future.

Conclusion

The integration of Vendor Managed Inventory into the Inventory Routing Problem offers a promising solution for organizations looking to enhance their supply chain efficiency. By fostering collaboration, improving demand forecasting, and optimizing inventory replenishment, VMI in IRP provides a competitive edge in today's dynamic business environment. While challenges exist, the potential benefits of implementing VMI in IRP are a worthwhile endeavor for organizations committed to staying at the forefront of supply chain innovation.

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Bibliometric Examination of "Bona Vacantia": Charting Patterns and Research Trends

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Abstract: This paper employs a bibliometric analysis to examine the primary sources of publication, authorship, citations, and research trends concerning *Bona vacantia*. *Bona vacantia*, often known as ownerless property, carries significant legal and economic significance on a global scale. Comprehending the academic discussion surrounding a topic benefits legal professionals, policymakers, and researchers. Retrieving 645 relevant articles from the Scopus database spanning 2003 to 2023, the study employs data refining and various bibliometric methods, including cluster and network analysis and word cloud generation. The analysis reveals 158 contributors from 69 countries, predominantly publishing articles. It identifies key articles, authors, and journals shaping the discourse on *Bona vacantia*. Although the insights provided are valuable, it is crucial to understand the limits in terms of database coverage, chronology, and paper scope. Future research should incorporate diverse databases and extend temporal perspectives to understand *Bona vacantia* comprehensively. This study recommends a broader research expansion to enhance understanding of this multifaceted subject.

Keywords: *Bibliometric analysis, bona vacantia, publication trends, global landscape, temporal perspective*

1. Introduction

Bona vacantia, Latin for "ownerless property," is a legal concept about assets without an identifiable owner. *Bona vacantia* has garnered interest in legal and estate planning circles, especially in Malaysia, where its implications are profound. The Baitulmal authorities in Malaysia primarily oversee the administration of *Bona vacantia* for Muslims, managing the assets of deceased individuals without heirs. An estimated RM60 billion in assets remain unclaimed since Malaysia gained independence in 1957. This amount has considerably increased from the RM42 billion reported as frozen in 2011. Although the unclaimed assets belong to both Muslim and non-Muslim citizens, it is presumed that Muslims own the majority of these assets (Karim, 2016). This paper embarks on a bibliometric examination, scrutinizing the evolving landscape of research on *Bona vacantia* over the past decades. The bibliometric study reveals a discernible surge in research activities surrounding *Bona vacantia*, with a notable emphasis on legal frameworks and implications (Liu et al., 2023). The concept of *Bona vacantia* extends beyond legal frameworks. Furthermore, the concept of *Bona vacantia* extends beyond legal frameworks, touching upon intersections with Islamic estate planning and management, as observed in qualitative studies, particularly in Malaysian contexts (Abd Wahab et al., 2021; Kamarudin & Muhamad, 2018). This paper aims to provide insights into the bibliometric landscape of *Bona vacantia* research, underscoring the importance of effective management and legal clarity.

The subsequent sections of this manuscript are structured as follows: Initially, this paper provides an examination of existing literature concerning bibliometric analysis and prior research related to *Bona vacantia* papers. It then outlines the methodologies used in this study. The ensuing section, dedicated to analysis and findings, presents outcomes derived from documents retrieved from the Scopus database. Finally, the concluding segment encompasses a discussion on the summary, contributions, limitations, and recommendations for future research.

2. Literature Review

Unclaimed estates pose a significant and escalating issue in Malaysia, with their value rising annually, creating complexities in their administration. One of the categories of these estates is *Bona vacantia* or ownerless estate, where individuals pass away intestate without heirs. The presence of diverse laws governing distinct types of *Bona vacantia* estates leads to unique administration methods. This paper aimed to identify and perform an analysis of the Scopus publication, authorship, citations, and research trends on *Bona vacantia.*

According to Rahman et al. (2018), the diverse range of agencies involved in managing Muslim estates in Malaysia has led to inconsistencies in their duties and responsibilities, causing confusion among the public. The observation of varying laws and procedures across states in West Malaysia for both Muslims and non-Muslims prompts this research. The fragmented legal provisions for Muslims and the administration are state-based. Additionally, non-Muslims face a multifaceted situation due to the dual-level administration at both the federal and state levels for movable and immovable estates, respectively.

A study by Halim et al. (2019) examined the administration of *Bona vacantia* for Muslims and non-Muslims in West Malaysia, revealing distinct legal frameworks and procedures across states. Baitulmal receives both movable and immovable *Bona vacantia* estates for Muslims, while the YDPA fund receives movable properties for non-Muslims, and the State Authority takes responsibility for immovable properties (Halim et al., 2019). Notably, the adequacy of these laws has not been thoroughly discussed. Furthermore, Yusoff (2019) highlighted in her thesis the absence of specific data on *Bona vacantia* amounts held by various entities, particularly at the federal level. However, available data is limited to certain regions for Muslims only, underscoring the need for comprehensive research on the management and valuation of *Bona vacantia* assets by Baitulmal and State authorities (Yusoff, 2019).

Arshad and Halim (2015) and Mohammada and Suratman (2017) criticized the system's fragmentation, contradictions, and lack of comprehensiveness. The distribution of unclaimed estates is contingent on recording, prompting a call for further research to address this issue and establish a unified legal framework for inheritance law (Arshad & Halim, 2015; Mohammada & Suratman, 2017). Hence, Halim et al. (2018) emphasized the necessity of a standardized legal framework in Malaysia to resolve the current administrative disparities and ambiguities (Halim et al., 2018).

Concerns about the lack of uniformity in the redemption process for Baitulmal portions between states, as highlighted by Baharuddin Aziz and Seh Nilamuddin bin Hassan, further underscore the need for standardization. Registration methods, property value assessments, and reluctance to make applications or payments pose additional challenges to the effective administration of *Bona vacantia* (Aziz, 2019; Hassan, 2012). The existence of multiple offices overseeing the estate distribution division raises concerns about potential discrepancies in administration practices among different states. In conclusion, the discussion reveals that existing legislation and administration regarding *Bona vacantia* in West Malaysia lack uniformity and are inadequate. Therefore, without defined processes, it is crucial to highlight the necessity for additional study and the establishment of uniform legal frameworks.

3. Method

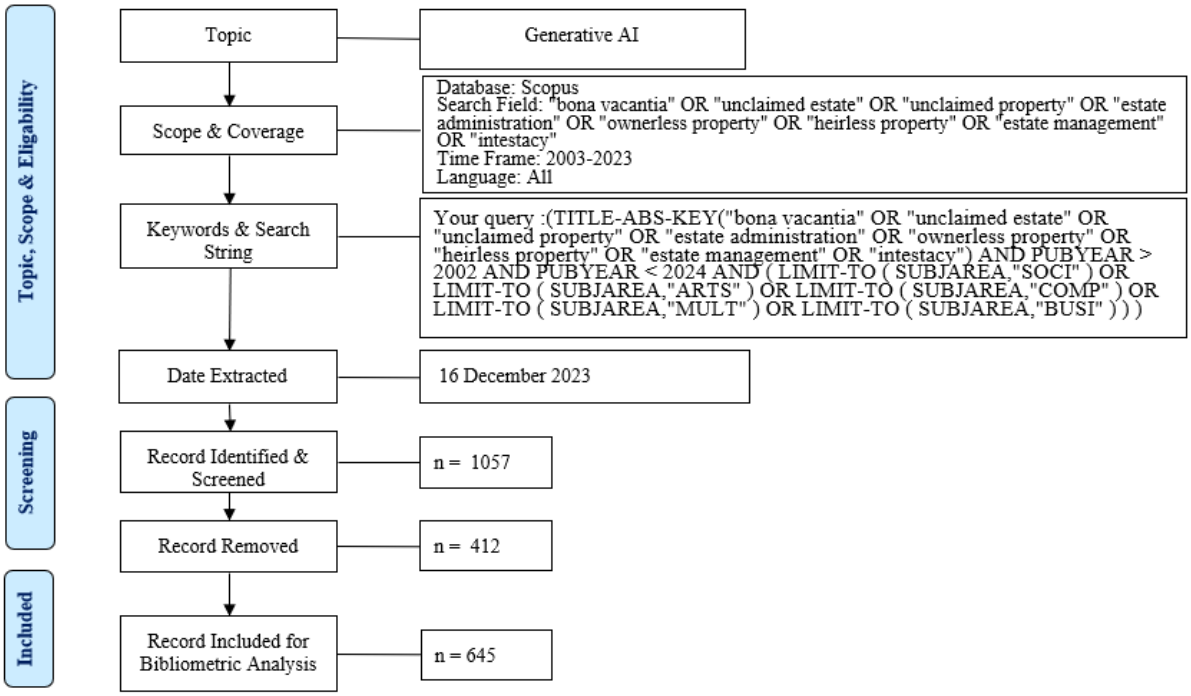
This study's principal aim is to execute an exhaustive bibliometric analysis of academic works on the legal concept of "*Bona vacantia*" and its interconnected ideas. The analysis seeks to systematically review the current literature, pinpointing fundamental themes, contributors, and research trends within this domain.

Bibliometric analysis is a commonly used quantitative research method in academic writing. It involves evaluating and analyzing scholarly literature by studying citations, publication trends, and academic collaborations. The investigation employed a bibliometric analysis method, recognized as a widely utilized technique for evaluating the influence of prior research (Ellegaard & Wallin, 2015). In their 2012 publication in Library Management, Gumpenberger et al. (2012) contributed to understanding bibliometrics, which they described as an emergent field for academic libraries (Gumpenberger et al., 2012). Dragos and Dragos (2013) conducted a bibliometric analysis to identify factors influencing scientific productivity in environmental sciences and ecology (Dragos & Dragos, 2013). Their research shed light on the key drivers behind research output and impact within these fields. Garg et al. (2023)conducted a bibliometric study that offers valuable insights into fintech trends. Bibliometric analysis is a potent tool for researchers, offering insights into the impact, influence, and trends within specific fields of study (Garg et al., 2023).

Hence, this study employed data obtained from the Scopus database as of December 2023. In the quest for relevant articles on *Bona vacantia*, we strategically selected keywords, such as "*bona vacantia*," "unclaimed estate," "unclaimed property," "estate administration," "ownerless property," "heirless property," "estate

management," and "intestacy," recognizing the varied terminologies associated with *Bona vacantia* globally. According to Chen (2016)., the title of an article is crucial in capturing readers' attention and serving as the primary element observed by readers (Chen, 2016). The query yielded a comprehensive dataset comprising 645 documents, forming the foundation for our bibliometric analysis. In navigating bibliometric patterns, we harnessed diverse tools: (1) Microsoft Excel for computing publication frequencies and generating relevant charts and graphs; (2) VOSviewer for constructing and visualizing bibliometric networks; and [3] Harzing's Publish and Perish software for calculating citation metrics and other pertinent frequencies.

Figure 1: PRISMA Flow Diagram



4. Results and Discussion

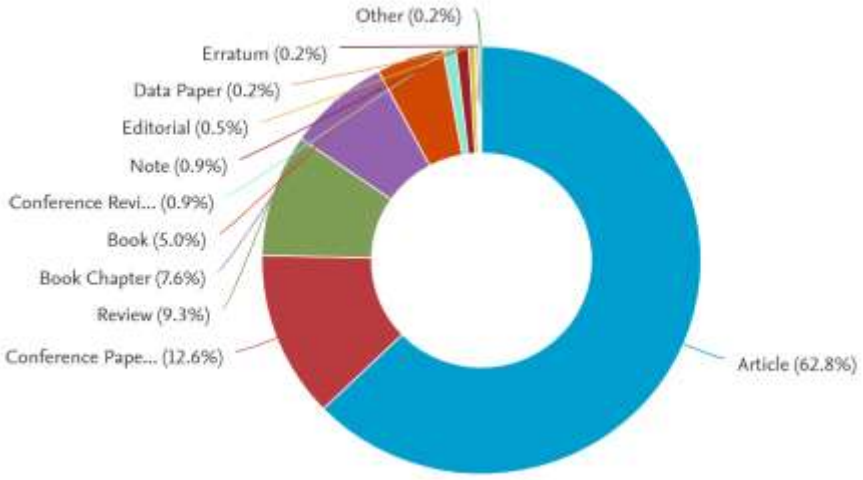
The data obtained from the Scopus database was used to analyze bibliometric attributes, including publication by year and annual growth, document types and source types, the language of the document, subject area, keyword analysis, country productivity, authorship, active institution, and citation analysis. We present most of the findings in frequency and percentage format. As per the VOSviewer manual, the tool maps the co-occurrence of author keywords, reports citation analysis as citation metrics, and reveals the most cited articles (Van Eck & Waltman, 2021).

Types of documents and sources: Table 1 briefly categorizes 645 scholarly publications by document type. Articles dominate with 62.79%, followed by conference papers (12.56%), reviews (9.30%), and book chapters (7.60%). Books comprised 4.96%, while other types like conference reviews and editorials are less than 1% each. The predominance of articles indicates their crucial role in scholarly communication. The presence of diverse document types demonstrates the complex nature of academic discourse. This distribution is crucial for bibliometric studies, revealing patterns in academic publishing. The data provides information to researchers and policymakers about the prevailing modes of knowledge dissemination. Citing Zuccala (2016) and Fan et al. (2022), the impact of such analyses on scholarly contributions and collaborative dynamics is apparent, highlighting the value of these indicators in assessing academic influence within the research community (Fan et al., 2022; Zuccala, 2016).

Table 1: Document Type

Document Type	Total Publications (TP)	Percentage (%)
Article	405	62.79%
Conference Paper	81	12.56%
Review	60	9.30%
Book Chapter	49	7.60%
Book	32	4.96%
Conference Review	6	0.93%
Note	6	0.93%
Editorial	3	0.47%
Data Paper	1	0.16%
Erratum	1	0.16%
Short Survey	1	0.16%
Total	645	**100.00**

Figure 2: Document Type



Based on Table 2, our analysis of 645 publications indicates that most depend significantly on journals, accounting for 72.56% of the total. Books (11.47%) and conference proceedings (9.92%) also contribute significantly, while book series (5.43%) and trade journals (0.62%) play niche roles. This distribution underlines the importance of peer-reviewed articles in academic discourse.

To assess the significance of these differences, we performed chi-square tests ($p < 0.05$), confirming that the observed distribution is not by chance. These findings align with recent studies, suggesting a shift towards more diverse publication platforms (Balstad & Berg, 2020; Zhao, 2022). Ellegaard's bibliometric analysis further supports this trend, indicating a growing impact of conferences and books on scholarly communication (Ellegaard & Wallin, 2015).

Table 2: Source Type

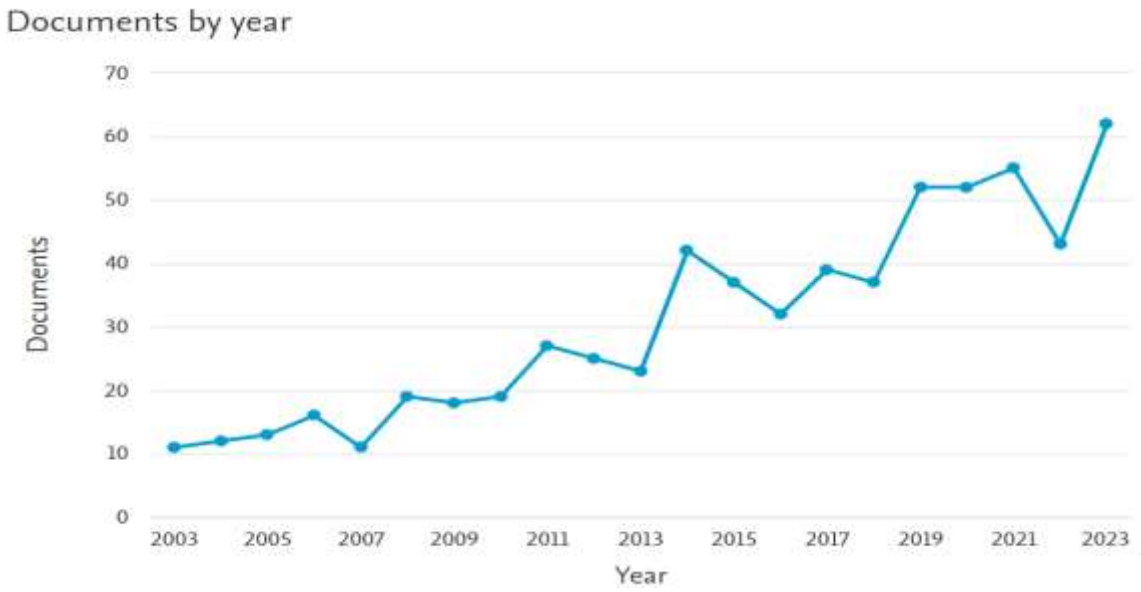
Source Type	Total Publications (TP)	Percentage (%)
Journal	468	72.56%
Book	74	11.47%
Conference Proceeding	64	9.92%
Book Series	35	5.43%
Trade Journal	4	0.62%
Total	**645**	**100.00**

Year of Publications / Evolution of Published Studies: Our analysis of 645 publications, which is based on the Scopus database, suggests a dynamic pattern in scholarly output over the years. A graphical trend analysis (Table 3) highlights a peak in 2023 with 62 publications (9.61%), suggesting an increasing interest in the field. Statistical tests reveal significant year-to-year variations ($p < 0.05$), reflecting the evolving nature of academic research. Statistical analysis using Analysis of variance (ANOVA) indicates substantial differences in annual publication frequencies ($p < 0.05$), suggesting a dynamic scholarly landscape. These fluctuations align with the broader trends in academic publishing, as discussed in recent literature (Balstad & Berg, 2020; Ellegaard & Wallin, 2015; Zhao, 2022).

Table 3: Year of Publications

Year	Total Publications	Percentage (%)
2023	62	9.61%
2022	43	6.67%
2021	55	8.53%
2020	52	8.06%
2019	52	8.06%
2018	37	5.74%
2017	39	6.05%
2016	32	4.96%
2015	37	5.74%
2014	42	6.51%
2013	23	3.57%
2012	25	3.88%
2011	27	4.19%
2010	19	2.95%
2009	18	2.79%
2008	19	2.95%
2007	11	1.71%
2006	16	2.48%
Total	**645**	**100.00**

Figure 3: Document by Year



Languages of Documents: Table 4 presents the linguistic composition of academic publications. English is the dominant language, accounting for 93.26% (609 out of 645) of the publications (Curry & Lillis, 2019). Chinese and French each contribute 1.07% (7 publications), while German and Spanish account for 0.92% (6 publications) and 0.77% (5 publications), respectively. Other languages, including Italian, Polish, Russian, Croatian, Lithuanian, Portuguese, Bosnian, Dutch, and Malay, have a marginal presence, contributing between 0.15% and 0.61%. This distribution highlights the domination of English in academic discourse. However, the minimal representation of other languages suggests opportunities for increasing diversity in academic publications. Scholars are encouraged to adopt multilingual approaches to promote inclusivity and extend the reach of research beyond English-speaking audiences (Kulczycki et al., 2020).

Table 4: Languages Used for Publications

Language	Total Publications*	Percentage (%)
English	609	93.26%
Chinese	7	1.07%
French	7	1.07%
German	6	0.92%
Spanish	5	0.77%
Italian	4	0.61%
Polish	3	0.46%
Russian	3	0.46%
Croatian	2	0.31%
Lithuanian	2	0.31%
Portuguese	2	0.31%
Bosnian	1	0.15%
Dutch	1	0.15%
Malay	1	0.15%
Total	**645**	**100.00**

Subject Area: Table 5 demonstrates the extensive range of research that spans multiple subject areas in the dataset. Social Sciences leads with 281 publications (43.57%), emphasizing the scholarly focus on societal issues. The field of Business, Management, and Accounting has a total of 235 publications, accounting for 36.43% of the total. This indicates a significant preference for business studies. Additionally, Economics, Econometrics, and Finance are prominent fields, accounting for 180 papers, corresponding to 27.91% of the total. The Arts and Humanities, along with Computer Science, each add 124 publications (19.22%), highlighting a balance between humanistic and technological research. Engineering's 121 publications (18.76%) highlight the balance of social and technical studies. Lesser represented fields include Environmental Science, Mathematics, and Agricultural and Biological Sciences, with respective counts of 59 (9.15%), 26 (4.03%), and 21 (3.26%) publications. Decision Sciences, Earth and Planetary Sciences, and Energy are niche areas within the dataset. Other disciplines like Physics, Astronomy, and various sciences contribute to the dataset's diversity, albeit in smaller numbers. This analysis underscores the diverse and collaborative nature of the research represented.

Table 5: Subject Area

Subject Area	Total Publications	Percentage (%)
Social Sciences	281	43.57%
Business, Management and Accounting	235	36.43%
Economics, Econometrics and Finance	180	27.91%
Arts and Humanities	124	19.22%
Computer Science	124	19.22%
Engineering	121	18.76%
Environmental Science	59	9.15%
Mathematics	26	4.03%
Agricultural and Biological Sciences	21	3.26%
Decision Sciences	20	3.10%
Earth and Planetary Sciences	18	2.79%

Energy	13	2.02%
Physics and Astronomy	8	1.24%
Materials Science	6	0.93%
Multidisciplinary	6	0.93%
Biochemistry, Genetics and Molecular Biology	3	0.47%
Chemical Engineering	3	0.47%
Medicine	2	0.31%
Nursing	2	0.31%
Chemistry	1	0.16%
Neuroscience	1	0.16%
Psychology	1	0.16%
	645	100%

Most Active Source Titles: Table 6 highlights the key journals contributing to real estate research, showcasing the field's interdisciplinary nature. The "Journal of Corporate Real Estate" leads with 64 publications (9.92%), playing a crucial role in the field's discourse. "Real Estate Management and Valuation" follows with 25 publications (3.88%), marking its significance. Other significant sources include "Property Management" with 23 publications (3.57%), "Facilities" with 19 publications (2.95%), and "Journal of Facilities Management" with 10 publications (1.55%). Titles like "Land Use Policy," "Sustainability Switzerland," and "International Journal of Strategic Property Management" contribute diverse perspectives. Publications with a multidisciplinary approach, such as "Lecture Notes in Computer Science" and "LNICST," contribute to the existing literature in the field. This compilation of sources demonstrates the collaborative and varied nature of real estate studies, emphasizing the importance of examining multiple research topics to fully grasp the current trends and developments in the field.

Table 6: Most Active Source Title

Source Title	Total Publications	Percentage (%)
Journal Of Corporate Real Estate	64	9.92%
Real Estate Management and Valuation	25	3.88%
Property Management	23	3.57%
Facilities	19	2.95%
Journal Of Facilities Management	10	1.55%
Land Use Policy	10	1.55%
Sustainability Switzerland	10	1.55%
Lecture Notes in Computer Science Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics	8	1.24%
International Journal of Strategic Property Management	7	1.09%
Journal Of Property Investment and Finance	6	0.93%
Lecture Notes of The Institute for Computer Sciences Social Informatics and Telecommunications Engineering Lnicst	5	0.78%
Rural History	5	0.78%
Journal Of Real Estate Practice and Education	4	0.62%
Lecture Notes in Networks and Systems	4	0.62%
Geomatics And Environmental Engineering	3	0.47%
International Archives of The Photogrammetry Remote Sensing and Spatial Information Sciences ISPRS Archives	3	0.47%
Iowa Law Review	3	0.47%
Journal Of General Management	3	0.47%
Journal Of Property Research	3	0.47%
Organization Technology and Management in Construction	3	0.47%

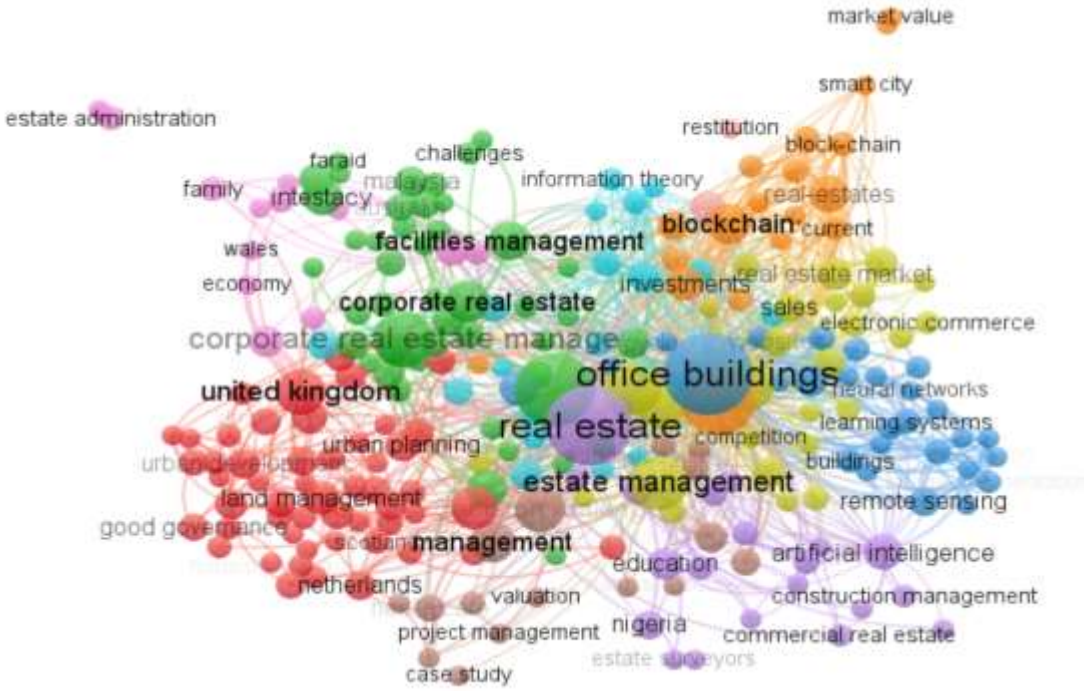
Keywords Analysis: Table 7 provides an insightful overview of the key themes in real estate and office building management literature. The most common keyword is "Office Buildings," appearing in 12.09% of publications, highlighting the importance of office space design and management. "Real Estate," the second most common keyword, features in 11.01% of publications, indicating a broad exploration of the real estate industry. The keywords "Real Estate Management" and its variant collectively appear in over 100 publications, demonstrating a focus on effective management practices. A subset of this is "Corporate Real Estate Management," which emphasizes managing real estate assets in a corporate setting. "Estate Management" and "Information Management" suggest a parallel interest in the physical and informational aspects of real estate. Broader concepts like "Decision Making," "Sustainability," and "Innovation" reflect a growing emphasis on sustainable and innovative decision-making processes. The "United Kingdom" is a prominent study area, suggesting a focus on the UK's real estate landscape. Current developments involve the incorporation of "Blockchain" and "Artificial Intelligence" into real estate operations. Fluctuations in keyword phrases offer valuable information on the changing language used in the field. These findings provide a detailed and subtle perspective on the research environment in the field of real estate and office building management.

Table 7: Top Keywords

Author Keywords	Total Publications	Percentage (%)
Office Buildings	78	12.09%
Real Estate	71	11.01%
Real Estate Management	60	9.30%
Real Estate Management	51	7.91%
Corporate Real Estate Management	32	4.96%
Estate Management	31	4.81%
Information Management	31	4.81%
Property Management	28	4.34%
Apartment Houses	22	3.41%
Decision Making	21	3.26%
United Kingdom	20	3.10%
Sustainability	18	2.79%
Corporate Real Estate	17	2.64%
Management	17	2.64%
Blockchain	15	2.33%
Facilities Management	14	2.17%
Innovation	13	2.02%
Intestacy	13	2.02%
Real estates	13	2.02%
Artificial Intelligence	12	1.86%

The analysis of author keywords using VOSviewer, a tool for constructing and visualizing bibliometric networks (Figure 4), reveals a comprehensive exploration of the field of real estate. The dominant node, "real estate," is surrounded by associated terms like "corporate real estate," "facilities management," and "office buildings," indicating the various aspects of real estate management and investment. The complexity of real estate as a discipline is illustrated by the interconnected terms. Technological advancements are suggested by the terms "blockchain" and "smart city." The presence of "estate management" and "land management" near geographical locations like "United Kingdom" and "Malaysia" indicates a focus on regional practices and legal frameworks. The nodes "family," "intestacy," and "faraid" (Islamic inheritance law) highlight the personal and legal aspects of real estate, particularly in estate administration and inheritance. This visualization highlights the diverse and complex aspects of real estate, including technical advancements, corporate participation, urban growth, and personal aspects of property ownership and inheritance. It presents real estate as more than just an economic opportunity but also a crucial element of urban growth and personal financial management.

Figure 4: Network visualization map of the author keywords



This study conducted a keyword analysis using WordSift to generate a word cloud, as displayed in Figure 5. The word cloud displays the top 100 words from a published article on *Bona vacantia*, with each word's size indicating its frequency of occurrence. Besides the primary keyword used for document search, the word cloud revealed other emerging keywords such as 'Management,' 'estate,' 'real,' 'market,' 'corporate,' 'public,' 'property,' and 'systems.' These words, despite their smaller size, have been used in the context of *Bona vacantia*. The words in Figure 5 represent trending terms in *Bona vacantia* research, suggesting potential focus areas for future studies on the topic.

Figure 5: Top keywords



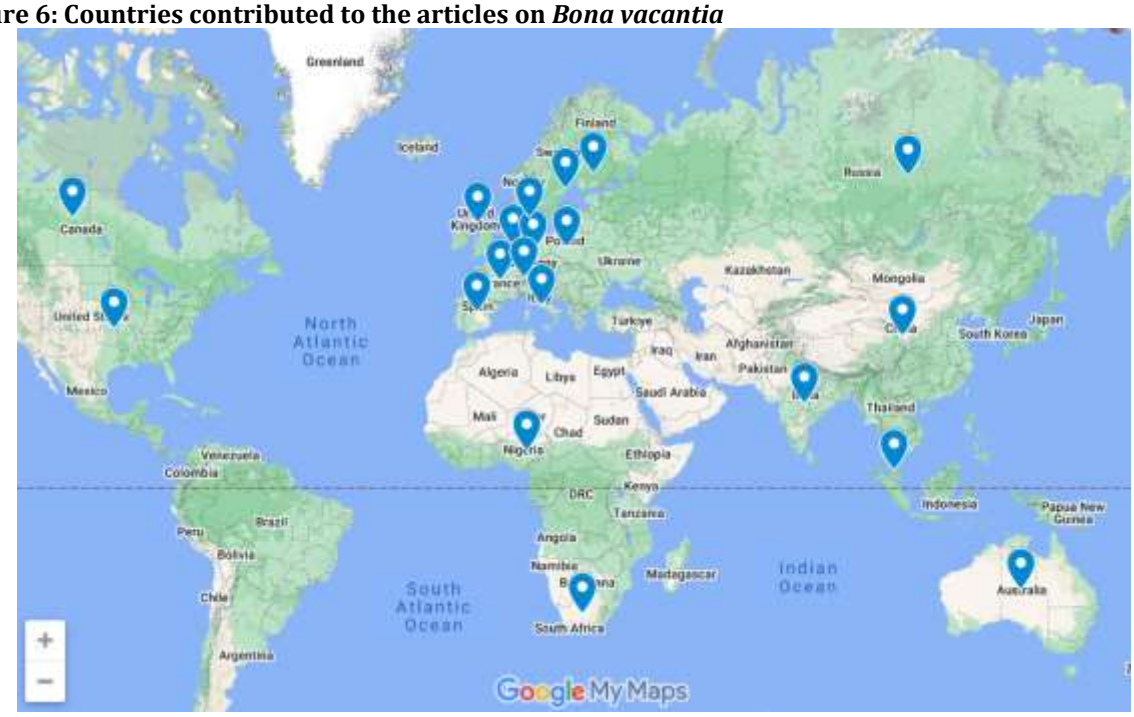
Geographical Distribution of Publications - Most Influential Countries: Table 8 offers a detailed snapshot of the global distribution of scholarly publications. The United Kingdom leads with 96 publications, accounting for 14.88% of the total. The United States follows with 72 publications (11.16%), and the Netherlands and Poland rank third and fourth with 59 (9.15%) and 50 (7.75%) publications respectively. China and Germany

also have a significant presence, contributing 39 (6.05%) and 38 (5.89%) publications. Australia, Malaysia, Italy, and Nigeria have made substantial contributions as well. The following countries are included in the list: Finland, India, Sweden, Denmark, France, Switzerland, Canada, South Africa, the Russian Federation, and Spain. Each of these countries contributes between 1.24% and 2.64% to the overall number of publications. This data emphasizes the wide-ranging international involvement in academic production, with notable contributions from the United Kingdom, the United States, the Netherlands, and Poland. These insights offer a detailed and comprehensive understanding of the present academic environment and the influence that different countries have on the discussion.

Table 8: Top 20 Countries contributed to the publications.

Country	Total Publications	Percentage (%)
United Kingdom	96	14.88%
United States	72	11.16%
Netherlands	59	9.15%
Poland	50	7.75%
China	39	6.05%
Germany	38	5.89%
Australia	34	5.27%
Malaysia	31	4.81%
Italy	22	3.41%
Nigeria	18	2.79%
Finland	17	2.64%
India	12	1.86%
Sweden	12	1.86%
Denmark	11	1.71%
France	11	1.71%
Switzerland	10	1.55%
Canada	9	1.40%
South Africa	9	1.40%
Russian Federation	8	1.24%
Spain	8	1.24%

Figure 6: Countries contributed to the articles on *Bona vacantia*



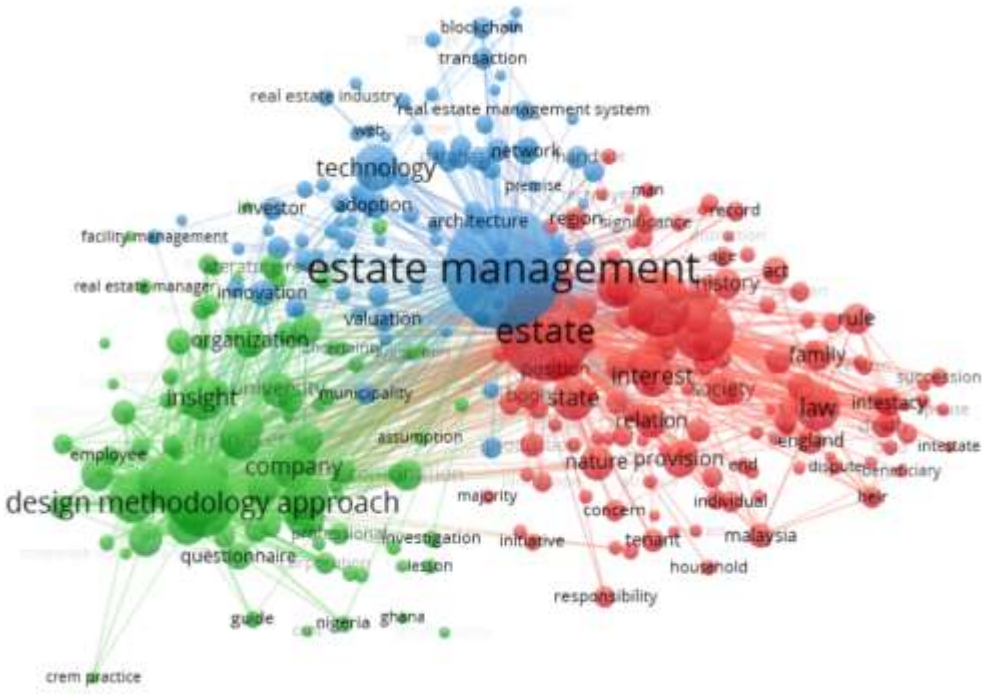
Authorship: Table 9, titled "Most Productive Authors," presents a detailed analysis of authors' productivity based on their document count and percentage contributions to the total publications. Leading the list are Dewulf, G., and Jensen, P.A., each with eight documents, accounting for 1.24% of the total. Oladokun, T.T., closely trails behind with seven documents, accounting for 1.09% of the total. Appel-Meulenbroek, R., Arkesteijn, M., and van der Voordt, T. each have six documents, contributing 0.93% each. Other notable contributors include Gross, M., Heywood, C., Palm, P., Pfnür, A., Stoy, C., Ullah, F., and Voordijk, H., each with five documents (0.78% each). The list continues with authors contributing between 0.47% and 0.62% each. This analysis underlines the diverse levels of scholarly output, with Dewulf, G., and Jensen, P.A., emerging as the most prolific contributors. Their significant impact in the field is highlighted by their respective contributions of 1.24% to the total publications.

Table 9: Most Productive Authors

Author's Name	No. of Documents	Percentage (%)
Dewulf, G.	8	1.24%
Jensen, P.A.	8	1.24%
Oladokun, T.T.	7	1.09%
Appel-Meulenbroek, R.	6	0.93%
Arkesteijn, M.	6	0.93%
van der Voordt, T.	6	0.93%
Gross, M.	5	0.78%
Heywood, C.	5	0.78%
Palm, P.	5	0.78%
Pfnür, A.	5	0.78%
Stoy, C.	5	0.78%
Ullah, F.	5	0.78%
Voordijk, H.	5	0.78%
Boakye-Agyeman, N.A.	4	0.62%
Nenonen, S.	4	0.62%
Valks, B.	4	0.62%
van der Voordt, T.J.M.	4	0.62%
Arkesteijn, M.H.	3	0.47%
Beckers, R.	3	0.47%
Cienciała, A.	3	0.47%

Text Analysis: The study employs the VOSviewer complete count approach to explore the headers and abstracts of a document, as depicted in Figure 7. This diagram represents the frequency and the interconnection of different phrases associated with the concept of "estate management." The nodes' size corresponds to the frequency of occurrence, while the lines' thickness reflects the strength of the links between phrases. The key topics of "estate," "management," "technology," and "design" are emphasized as central terms. The relevance and frequency of each term are indicated by its color and size, with red likely reflecting the most common concepts. The interconnected terminology such as "law," "family," "property," and "valuation" highlight their significance in the field of estate administration. The presence of the green cluster indicates a concentration on strategic elements, while the inclusion of geographical terms such as "Nigeria" and "Ghana" implies a focus on research particular to those regions. The inclusion of the terms "blockchain" and "database" within the blue cluster signifies the significance of technology in contemporary real estate administration. The visualization effectively portrays the complex and diverse aspects of estate management, emphasizing the convergence of legal, familial, technological, and strategic components.

Figure 7: VOSviewer visualization of a term co-occurrence network based on title and abstract fields (Binary Counting)



Most Influential Institutions: Table 10 provides an overview of the most influential institutions with at least five publications. Delft University of Technology leads with 35 publications, accounting for 5.43% of the total output. Faculteit Bouwkunde van de TU Delft and Afdeling Management in the Built Environment, TU Delft follow with 20 (3.10%) and 15 (2.33%) publications, respectively. Other significant contributors include Aalto University, Uniwersytet Warminsko-Mazurski w Olsztynie, and Obafemi Awolowo University. Technische Universiteit Eindhoven, Technical University of Denmark, Universiteit Twente, and UNSW Sydney each contribute eight publications (1.24%). Technische Universität Darmstadt and International Islamic University Malaysia each have seven publications (1.09%). Five articles are contributed by several different universities, collectively representing 0.78% of the total. To summarize, the Delft University of Technology is the most influential institution, as indicated by the table that presents the distribution of publications among different institutions.

Table 10: Most influential institutions with a minimum of five publications

Institution	Total Publications	Percentage (%)
Delft University of Technology	35	5.43%
Faculteit Bouwkunde van de TU Delft	20	3.10%
Afdeling Management in the Built Environment, TU Delft	15	2.33%
Aalto University	14	2.17%
Uniwersytet Warminsko-Mazurski w Olsztynie	12	1.86%
Obafemi Awolowo University	10	1.55%
Technische Universiteit Eindhoven	10	1.55%
Technical University of Denmark	8	1.24%
Universiteit Twente	8	1.24%
UNSW Sydney	8	1.24%
Technische Universität Darmstadt	7	1.09%
International Islamic University Malaysia	7	1.09%
Universiti Teknologi MARA	6	0.93%
Malmö Högskola	6	0.93%

University of Melbourne	6	0.93%
Uniwersytet Szczecinski	6	0.93%
Universiti Kebangsaan Malaysia	5	0.78%
Universiti Utara Malaysia	5	0.78%
Norges Teknisk-Naturvitenskapelige Universitet	5	0.78%
Oxford Brookes University	5	0.78%
Universiti Teknologi Malaysia	5	0.78%
University College London	5	0.78%
University of Oxford	5	0.78%
Vilniaus Gedimino Technikos Universitetas	5	0.78%
Universiti Tun Hussein Onn Malaysia	5	0.78%

Citation Analysis: Table 11's citation metrics from 2003 to 2023 highlight the significant scholarly impact of 645 published papers, which collected 5,143 citations, averaging 257.15 citations annually. Each paper received roughly 7.97 citations, reflecting the research's visibility. The h-index is 30, denoting that 30 publications have each amassed at least 30 citations. The data points to a collaborative research environment, with an average of 2.26 authors per paper and a substantial contribution of 3173.22 citations per author. The average paper distribution per author is 384.83, indicating the authors' prolific nature. These metrics underscore the research's sustained impact and relevance over two decades, aligning with the trend of collaborative and influential scholarly work. Bibliometric analysis provides insights into collaboration patterns, research topics, and the overall impact of academic contributions, affirming the value of such evaluations in understanding scholarly progress across various fields. The cited sources highlight the ongoing importance of using extended bibliometric assessments to evaluate scholarly contributions within specified (Balstad & Berg, 2020; Wheeler et al., 2022; Zhao, 2022).

Table 11: Citations Metrics

Metrics	Data
Publication years	2003-2023
Papers	645
Citations	5143
Years	20
Cites_Year	257.15
Cites_Paper	7.97
Cites_Author	3173.22
Papers_Author	384.83
Authors_Paper	2.26
h_index	30

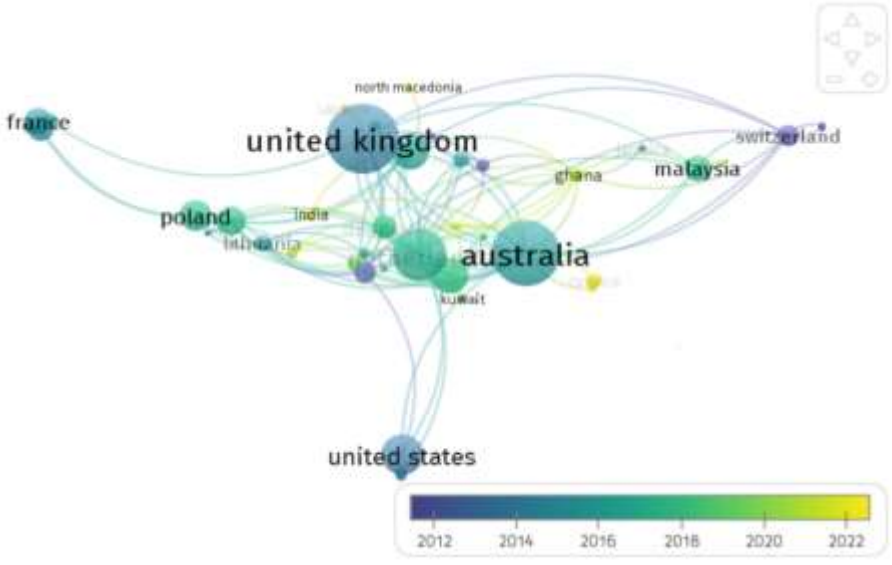
Meanwhile, Table 12 demonstrates the extensive range of scholarly studies by featuring a curated collection of articles that have received significant citations. C. Wickham's 2011 study on early medieval Europe has the greatest number of citations, with 687, while J. Braithwaite's 2008 article on regulatory capitalism has 564 citations. The table highlights influential studies in many disciplines, such as real estate, technology, image analysis, and energy. M.R. Guarini and colleagues' methodology in real estate and land management, published in 2018, acquired a notable 100 citations. Similarly, F. Ullah and the team's review on smart real estate technology gained a significant 97 citations. Interdisciplinary studies, such as the 2018 research conducted by R. Appel-Meulenbroek et al. on office environments, have gained significant recognition, with 49 citations. The 2023 paper by F. Ullah and F. Al-Turjman on blockchain in real estate management has received significant attention with 40 citations, indicating the increasing significance of blockchain technology. In general, the table illustrates the extensive influence and multidisciplinary character of current academic research.

Table 12: Highly cited articles

No.	Authors	Title	Year	Cites	Cites per Year
1	C. Wickham	Framing the Early Middle Ages: Europe and the Mediterranean, 400-800	2011	687	57.25
2	J. Braithwaite	Regulatory capitalism: How it works, ideas for making it work better	2008	564	37.6
3	M.R. Guarini, F. Battisti, A. Chiovitti	A methodology for the selection of multi-criteria decision analysis methods in real estate and land management processes	2018	100	20
4	F. Ullah, S.M.E. Sepasgozar, C. Wang	A systematic review of smart real estate technology: Drivers of, and barriers to, the use of digital disruptive technologies and online platforms	2018	97	19.4
5	S. Saito, Y. Aoki	Building and road detection from large aerial imagery	2015	77	9.63
6	C.C.D. Lelong, J.-M. Roger, S. Brégand, F. Dubertret, M. Lanore, N.A. Sitorus, D.A. Raharjo, J.-P. Caliman	Evaluation of oil-palm fungal disease infestation with canopy hyperspectral reflectance data	2010	75	5.77
7	H.S. Munawar, S. Qayyum, F. Ullah, S. Sepasgozar	Big data and its applications in smart real estate and the disaster management life cycle: A systematic analysis	2020	73	24.33
8	E. Engelen, R. Fernandez, R. Hendrikse	How Finance Penetrates its Other: A Cautionary Tale on the Financialization of a Dutch University	2014	65	7.22
9	E. Beusker, C. Stoy, S.N. Pollalis	Estimation model and benchmarks for heating energy consumption of schools and sports facilities in Germany	2012	61	5.55
10	P.A. Jensen, T. van der Voordt, C. Coenen, D. von Felten, A.-L. Lindholm, S.B. Nielsen, C. Riratanaphong, M. Pfenninger	In search for the added value of FM: What we know and what we need to learn	2012	52	4.73
11	F. Dornaika, A. Moujahid, Y. El Merabet, Y. Ruichek	Building detection from orthophotos using a machine learning approach: An empirical study on image segmentation and descriptors	2016	50	7.14
12	R. Appel-Meulenbroek, M. Clippard, A. Pfnür	The effectiveness of physical office environments for employee outcomes: An interdisciplinary perspective of research efforts	2018	49	9.8

13	A. Henn, C. Römer, G. Gröger, L. Plümer	Automatic classification of building types in 3D city models	2012	47	4.27
14	R. Beckers, T. Van Der Voordt, G. Dewulf	A conceptual framework to identify spatial implications of new ways of learning in higher education	2015	45	5.63
15	T.M. Hickey	Wine, wealth, and the state in late antique Egypt: The house of Apion at Oxyrhynchus	2012	43	3.91
16	X. Gan, J. Zuo, K. Ye, D. Li, R. Chang, G. Zillante	Are migrant workers satisfied with public rental housing? A study in Chongqing, China	2016	43	6.14
17	B.T. Nunes, S.J. Pollard, P.J. Burgess, G. Ellis, I.C. de los Rios, F. Charnley	University contributions to the circular economy: Professing the hidden curriculum	2018	41	8.2
18	F. Ullah, F. Al-Turjman	A conceptual framework for blockchain smart contract adoption to manage real estate deals in smart cities	2023	40	40
19	M. Palvalin, T. van der Voordt, T. Jylhä	The impact of workplaces and self-management practices on the productivity of knowledge workers	2017	40	6.67
20	A.-L. Lindholm	A constructive study on creating core business-relevant CREM strategy and performance measures	2008	38	2.53

Figure 8: VoSviewer overlay visualization map of the citation by countries



5. Conclusion and Recommendations

The present study significantly contributes to the expanding domain of *Bona vacantia*, or ownerless property estates. There has been a consistent growth in the quantity of publications in this field. Our bibliometric investigation yielded valuable information regarding significant journals, highly cited authors, and dominant

keywords in the field. This was achieved by employing various analytical techniques, including data refinement, investigation of bibliometric markers, cluster analysis, network analysis, and word cloud methodologies. Notably, a considerable fraction of these publications comprises articles and conference proceedings.

The study provides a significant understanding of the topic of *Bona vacantia*. However, it also reveals research gaps, suggesting the necessity for wider database coverage and a longer duration for future investigations. Although there are certain limits, the study highlights the significance of this work's contribution to the emerging area of *Bona vacantia*, which pertains to estates having no owner. There has been an ongoing surge in the number of publications on this topic. Our bibliometric investigation has yielded valuable information regarding the leading journals, authors with high citation counts, and prevailing keywords in the field. This was accomplished by utilizing a range of analytical methods, such as data refinement, examination of bibliometric indicators, cluster analysis, network analysis, and word cloud approaches. A significant proportion of these publications consist of articles and conference proceedings, which are worth mentioning. They provide policymakers with a clearer picture of the current state of research in the field, thereby guiding them in formulating informed and effective policies related to ownerless property estates. This study, therefore, serves as a valuable resource for both researchers and policymakers in the field of *Bona vacantia*.

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Enterprise Risk Management Practices in Malaysian Small and Medium-Sized Enterprises: An Overview

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Abstract: SMEs are crucial to the economic growth of many countries, particularly developing ones like Malaysia. SMEs have contributed significantly to economic growth but they also often struggle with problems related to poor management, which increases the risk of failure and closure. Effective risk management is essential in sustaining the long-term sustainability of SMEs and improving managerial performance. This study investigates the enterprise risk management (ERM) practices used by Malaysian SMEs in the manufacturing sector. The factors influencing the risk management behaviors and practices of SME manufacturing workers and their compliance with risk management protocols are examined in this study using a mixed-methods approach. This study focuses on employee behavior to better understand how organizational culture affects risk management techniques in SMEs. To design effective reward and recognition programs, this research also examines the psychological components of risk management while accounting for the organizational, societal, and financial challenges that followed the 2008 financial crisis. The study also examines the impact of organizational structure on the efficacy of risk management initiatives in small and medium-sized enterprises. The practical findings of the study are expected to demonstrate the extent to which ERM influences organizational effectiveness in Malaysia's SME manufacturing sector. This study intends to equip industry participants with the knowledge and confidence necessary to implement ERM successfully in their operations by offering insights into the factors that encourage and impede ERM adoption and its impact on organizational performance. This research advances ERM practices among SMEs and strengthens Malaysian businesses' resilience and risk awareness.

Keywords*: Enterprise Risk Management, Small and Medium Enterprises, Malaysia, Top Management, Reward and Recognition.*

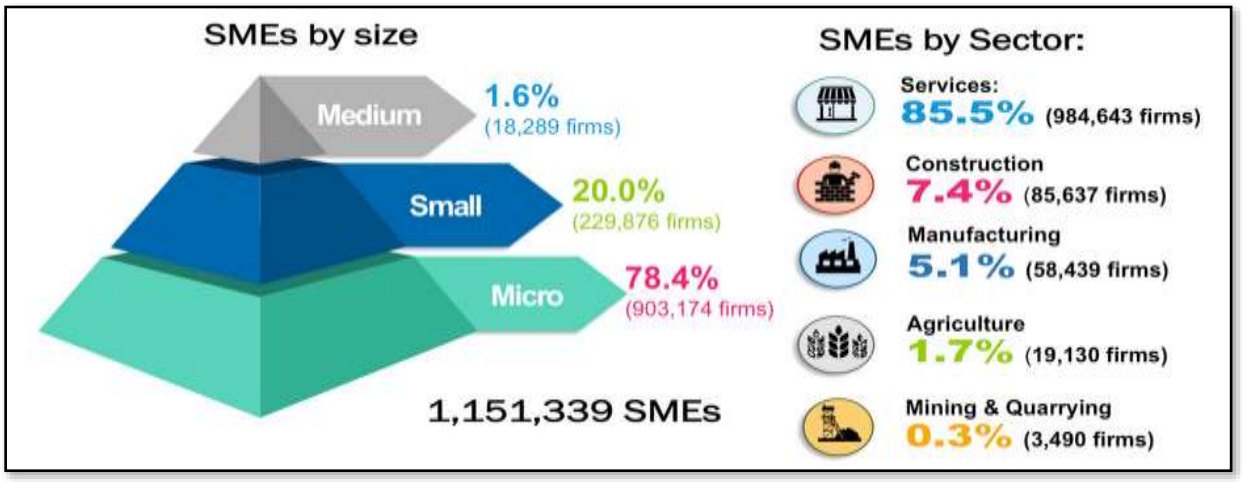
1. Introduction and Background

Most countries, especially developing ones, have many small and medium-sized businesses, or SMEs, which are essential to the growth of the economy. SMEs not only generate the greatest number of jobs relative to their size but also have the best rates of employment growth and sales growth, according to a study that used data from the World Bank Enterprise Surveys (ES) database on 49,370 enterprises in 104 countries (Yeboah, 2021). From Malaysia's perspective, SMEs are the backbone of Malaysia's economy, playing a significant role in economic growth, job creation, and innovation. Like many developing nations, Malaysia depends heavily on its SME sector to foster entrepreneurship and advance socioeconomic development. Over 98% of all businesses in Malaysia are small and medium-sized enterprises (SMEs). Manufacturing, services, agriculture, and technology are some of these industries. The GDP of Malaysia is influenced by the total number of small and medium-sized businesses, or SMEs, that are active in various industries. Consequently, these sectors play a major role in the economic growth of the nation. These sectors have emerged as the most significant to the nation's economy based on the contributions made in the past by SMEs, and the government has taken action to support SMEs' expansion in these areas (Tahir et al., 2018).

SMEs account for about two-thirds of all jobs in the nation, making them vital sources of employment in addition to being important contributors to GDP. Additionally, SMEs play a crucial role as nodes in supply chains, promoting local economic development in both rural and urban regions and assisting in the expansion and competitiveness of bigger businesses. SMEs are consequently among the largest industries, encompassing a wide range of businesses in the manufacturing, trading, services, and agricultural sectors. Furthermore, 90% of all business organizations in certain countries are SMEs. Similarly, based on estimates from the Department of Statistics Malaysia (DOSM) for the year 2020, SMEs in Malaysia account for about 97.2% of all businesses. An overview of SMEs in Malaysia is given in Figure 1. In 2020, there were 1,151,339 SMEs in Malaysia, accounting for 97.2% of all firms, according to the DOSM. The Malaysia Statistical Business Register (MSBR)

has the latest recent statistics, which are the source of this data. Compared to the 1,086,157 SMEs that existed nationwide in 2016, almost 140,000 new enterprises have been founded. This has led to an average annual growth rate of 5.2% over the five years.

Figure 1: Overview of SMEs in Malaysia



The SME sector is significant for reasons other than just economics. SMEs frequently serve as engines for social mobility, giving people from all walks of life the chance to follow their dreams and participate in the entrepreneurial world. Additionally, by encouraging inclusive growth throughout Malaysia's several states and territories and decentralizing economic activity, SMEs support regional development. Small and medium-sized enterprises (SMEs) encounter several obstacles that impede their expansion and endurance. These difficulties include restricted financial resources, deficient infrastructure, onerous regulations, and challenges in attracting and retaining people. Furthermore, SMEs are especially susceptible to outside shocks and uncertainties, including shifts in the dynamics of the market, disruptions from new technologies, and downturns in the world economy. When compared to major corporations and SMEs in other industrialized nations, SME productivity in Malaysia is poor (SME Corporation Malaysia, 2012). The average productivity per worker for SMEs is RM 47,000, or about one-third that of large businesses. In contrast, SMEs in Singapore and the US are four and seven times more productive than SMEs in Malaysia, according to SME Corporation Malaysia (2012). Most SMEs in developing countries struggle with productivity issues (Ayyagari et al., 2011). Low productivity is an indicator of SME failure or crisis as well as a risk factor (Ropega, 2011).

SMEs are frequently exposed to threats from the inside as well as the outside. Uncertainty is rampant due to the rapid changes in the corporate environment. Innovation in new products, changing consumer preferences, and technological advancements are a few examples of this. SMEs are also susceptible to internal hazards, which include things like production disruption, technical malfunction, corruption, and human mistakes (Dickinson, 2001). SMEs need to be creative and continuously enhance their processes and practices to succeed in this environment (Bahri et al., 2011). In the current age of globalization, risk is a ubiquitous component shared by all industries, and it is typically perceived as a loss to a company. Risk is the potential for loss rather than an actual loss. Schieg (2006) defined risk as a deviation of a variable, either positively or negatively, from its expected value. Taillandier et al., (2015) asserted that organizational variables and human decision-making processes have the greatest influence on risk. This suggests that, depending on how an organization manages risk, risk can either present an opportunity or a threat. When risks materialize, they will influence the organization's performance in terms of cost, quality, and time, which will cause delays and difficulties in achieving the objectives.

Conversely, organizations may reduce and manage risks through careful planning and management, allowing them to turn hazards into opportunities that will increase their success. Organizations need to be ready for any unforeseen events or uncertainties that can develop in the future (Olson & Wu, 2010). This is because well-prepared organizations can identify the dangers that they may face, which enables them to create backup plans

in case these hazards materialize. Therefore, one tactic that SMEs may use to manage the risks is enterprise risk management or ERM. Effective risk management techniques are crucial for the resilience and survival of SMEs in Malaysia considering these difficulties. SMEs may improve their long-term sustainability, competitiveness, and agility by proactively recognizing, evaluating, and reducing risks and opportunities. SMEs in Malaysia, however, still use very few enterprise risk management (ERM) practices; this is because many of these companies lack the institutional backing, resources, and expertise needed to put in place strong risk management frameworks. Considering this, this article presents an overview of Malaysian SMEs' enterprise risk management procedures. By examining the current landscape of risk management in the SME sector, identifying key challenges and opportunities, and offering insights into potential strategies for improvement, this study aims to contribute to the enhancement of risk management capabilities and the overall resilience of SMEs in Malaysia.

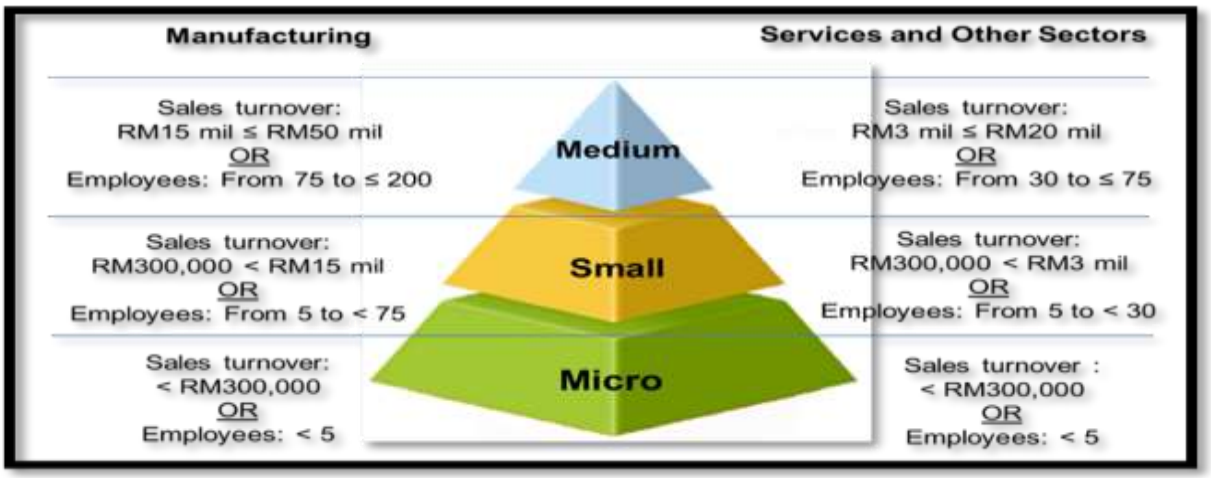
Problem Statement: One major issue that has contributed to the recent failure of some SMEs is management. Take, for example, the inability of Malaysian SMEs to establish marketing networks and their ignorance of marketing channels. The primary problems that Malaysian SMEs have, according to Muhammad (2011) and Hashim and Wafa (2002), are a lack of knowledge about branding, marketing tactics, and client loyalty as well as a lack of solid connections with both domestic and international companies (Khalique et al., 2011). In addition, Malaysia's SMEs are impacted by the Covid-19 pandemic. An event that people, groups, or organizations are unable to control by following regular, normal procedures is referred to as a crisis (Booth, 1993; Anthony et al., 2019; Lai, 2020). The author classified crises into three categories based on the study's findings: abrupt, periodic, and chronic threats. The COVID-19 epidemic is considered a "sudden threat" since it struck suddenly and caused a major global economic shock in addition to negative effects on health (Booth, 1993). During the lockdown phase, SMEs face significant hurdles such as interruptions to their company operations and temporary closures. According to Minister of Human Resources, Datuk Seri M Saravanan, 2,713 SMEs were compelled to shut down their activities between March and December 2020 because of the government's abrupt execution of the MCO.

Most SMEs are also affected by internal management issues, which result in staff members suffering from pay cuts or nonpayment of salaries. Poor management, which increases the possibility of termination or closure, is a common cause of organizational failures. Consequently, it is critical for any organization and society to increase managerial effectiveness and effective risk management (Muniapan, 2007). Interaction between internal and external stakeholders is necessary for risk management (Kutsch & Hall, 2010). To foster a sense of individual accountability for risks and their management, the entire management team needs to be included in the risk management process (Project Management Institute, 2004). A follow-up study found that a behavior approach is required since it is becoming clear that employee conduct and attitude affect their ability to recognize danger in the workplace (Curty et al., 2017). Prior years have seen a greater emphasis on improving compliance behavior, specifically on adhering to safety norms and regulations (DeJoy et al., 2004). For example, safety studies have shown that most of these incidents are caused by human mistakes. Another name for this is “people risk." Therefore, it is critical to investigate how employees in SME manufacturing follow a set of procedures for risk management.

2. Literature Review

Malaysia's industrial industry and overall economy have risen dramatically since the country gained independence in 1957. After relying heavily on "natural" resources like tin and rubber, it began to diversify into other natural resources, such as palm oil. Malaysia has developed a great number of manufacturing sectors unrelated to its natural resource bases, such as the palm oil processing industry, even though it has also established several unrelated manufacturing sectors like steel and automotive industries. Figure 2 defines the manufacturing micro firm as one that employs less than five full-time workers or has an annual sales turnover of less than RM 300,000. A small business has a sales turnover of between RM300,000 and less than RM15 million, or five to fewer than 75 full-time employees. SME Corp. Malaysia (2013) defines medium-sized businesses as those with 75–200 full-time employees or RM15–50 million in annual sales.

Figure 2: Detailed Definition of SME Category



Risk: In his 1997 book Against the Gods, financial journalist Peter Bernstein claimed that the term "risk" came from the ancient Italian word "Risco" or "Risicare," which means to dare. A careful reading of the literature demonstrates that there is no clear definition for the concept of risk. Risk, according to Teoh and Muthuveloo (2015), is the chance that the outcome of a procedure will not meet expectations. On the other hand, the risk was described by Mhetre, Konnur, and Landage (2016) as any event or action that will affect the project's goals being achieved.

Risk Management: Risk management is a method that involves determining the origins of hazards from many domains, assessing the risks, and using suitable measures to mitigate them (Zou, Zhang, & Wang, 2006). Effective risk management, according to the authors, can help organizations better identify the dangers they will face and get ready to handle them. According to Zavadskas et al., (2010), risk management is a continuous process that involves identifying risk sources, evaluating risk consequences, developing coping mechanisms, and getting feedback from organizations to improve risk response plans. This procedure helps guarantee that the goals of the organization are accomplished. In addition, Banaitiene and Banaitis (2012) presented a similar viewpoint on risk management in their study, stating that risk management is an iterative process that is methodically carried out from the project's planning phase to its completion.

Traditional Risk Management: According to Madushanki and Ekanayake (2022), TRM aims to address management issues related to exposures that have the potential to cause either a loss or no change at all. The total risk profile of the institution and the impact of risks on accomplishing the organization's strategic goals are not considered by TRM, even though it enables institutions to assign risk management to the specific units most impacted by risks. As the benefits of TRM, in a world that is more linked and complicated, became apparent over time, the shift to ERM started. As time and technology advance, organizations are becoming more conscious of the significance of risk management. Consequently, systematic risk management, or ERM, was adopted as a means of effectively identifying and responding to risks (Woon et al., 2011).

Enterprise Risk Management: ERM is based on the concept of risk management. Published in 1963, Risk Management in the Business Enterprise was the first risk management textbook. Maximizing a company's productive efficiency is risk management's first main objective (Zhu et al., 2023). Moreover, risk management has a long and contentious history in academic finance research. Finance experts used to think that corporate risk management is either obsolete or useless. Moreover, ERM has been around for more than 20 years; it is not a new practice. The first evidence of these operations dates back to 1998, according to Colquitt, Hoyt, and Lee's 1999 publication of the first academic study on ERM (Hoyt & Liebenberg, 2011; Iyer et al., 2010). The first ERM study was carried out by Colquitt et al., (1999), who looked at managers' responsibility for non-operational risks and the tactics they employ to reduce certain risks. Because of this, most ERM research has been published in peer-reviewed insurance and accounting publications, with a bias towards the use of management control systems and quantitative risk analysis (Iyer et al., 2010).

Landsittel and Rittenberg (2010) argued that ERM research ought to go beyond summarizing state-of-the-art methods. According to Iyer et al. (2010), since ERM research does not readily fit into any one subject, it can be analyzed from a range of management theory viewpoints. A study of the literature indicates that operational, strategic, financial, and hazard risk are the four main categories of risk that have been the subject of most prior research (D'Arcy, 2001; CAS, 2003; Cassidy, 2005). The researchers can conclude that risk management ought to encompass more than just the individual assessment of various risk kinds. The establishment of ERM in the late 1990s should have been the result of an integrated, comprehensive evaluation of many forms of risk. Cassidy (2005) claimed that planning, organizing, leading, and controlling (POLC) organizations are the birthplace of enterprise risk management (ERM), which includes programming for reorganizing an organization's processes to reduce risk. Additionally, it appears that ERP is a vital tool for businesses to look at when maximizing good effects and minimizing negative ones. More importantly, there have been major advantages for organizations that have adopted a more integrated strategy to control organizational risks. These advantages extend beyond organizations to include members and future successes (Lam, 2000). Implementing Enterprise Risk Management (ERM) has the potential to enhance a company's risk awareness and decision-making capabilities, ultimately leading to better firm performance (Razali et al., 2011).

Definition of Enterprise Risk Management: Smit and Watkins (2012) stated that for management to create a risk strategy that will address possible hazards as they materialize, risk management practices must be used. Since management will oversee organizing steps to lessen the likelihood of potential dangers, they must be equipped with risk management abilities. ERM is defined in several different ways. Enterprise risk management (ERM)—also referred to as "enterprise-wide risk management," "corporate risk management," "strategic risk management," "business risk management," "holistic risk management," and "integrated risk management"—is the most employed method by businesses to address uncertainty (D'Arcy, 2001). In the 1990s, it "exploded" (Arena et al., 2010). It is based on the function of internal controls which aims to offer a managerial viewpoint on a respectable level of certainty regarding the accomplishment of the organization's objectives (COSO, 2004). By incorporating risk management into goal-positioning and corporate strategy, which in turn influences accountability, control, and decision-making, ERM seeks to move beyond. To increase the value that organizations gain, enterprise risk management (ERM) is defined as an integrated framework that may be used to manage a variety of risks, including credit, market, operational, economic, political, and social risks (Lam, 2000). Instead of responding and reacting after threats have materialized and damage has been done, enterprise risk management (ERM) entails planning and anticipating organizational risks before problems arise (Barton et al., 2002). The definition of risk management given by Liebenberg and Hoyt (2003) is a systematic approach to risk control that shifts the focus of risk management from being largely defensive to being more aggressive and strategic.

Enterprise Risk Management Frameworks: There are several different ERM models in use now. However, the most utilized model is the Committee of Sponsoring Organizations of the Treadway Commission (COSO) model (Arena et al., 2010; Wan Daud et al., 2010; Tahir et al., 2018; Razali et al., 2011; Yazid et al., 2011). The evaluation of ERM in this study is based on the COSO model. The internal control-integrated structure developed by COSO serves as the foundation for the ERM methodology. Published in 1992, this framework attempts to offer a broad approach to the management of internal control systems. The framework creates a framework for risk management. The eight components represented by the horizontal rows are the internal environment, goal setting, event detection, risk assessment, risk response, control actions, information and communication, and monitoring. The vertical columns stand for the four objective categories: strategic, operational, reporting, and compliance. An entity's subsidiary, business unit, division, and entity level are the entities that make up its third dimension. The picture in Figure 3 illustrates the ability to concentrate on a certain target category, element, entity unit, or subset of an organization's enterprise risk management.

Figure 3: COSO's ERM Integrated Framework



Source: Imported from COSO (2004).

The eight interrelated parts of this framework, which are drawn from how management functions inside an organization, are included in the management process. The internal environment, which describes an organization's mindset and how its people view and handle risk, is the first of these elements. It also encompasses the operational environment, integrity and ethical standards, and the attitude and appetite for risk management. Objective setting is the second part, which calls for the defining of goals before management recognizes any occurrences that could jeopardize their accomplishment. ERM guarantees that management has developed a goal-setting procedure and that the goals chosen are covered by, in line with, and compatible with the mission and risk tolerance of the institution. Thirdly, event identification necessitates assessing how internal and external events impact the accomplishment of an entity's objectives and modifying the ratio of opportunities to hazards. Next, risk assessment involves the risks being evaluated, which include the expectations and consequences that go along with them, and how they are used to determine the best course of action. The fifth part is risk response in which the management should select the proper reactions, such as avoiding, accepting, lowering, or involving risk in an increase in a series of activities, to match risks to the entity's risk appetite and tolerances. Following that, control activities entail determining and implementing methods and policies to guarantee that risk responses are executed to the greatest caliber. Information and communication is the seventh part where appropriate information is found, acquired, and disseminated so that individuals can fulfill their duties. Finally, in monitoring, the whole ERM process is overseen, and necessary adjustments are implemented. Monitoring is done through ongoing management activities, independent assessments, or both.

Uses and Benefits of Enterprise Risk Management: According to COSO (2004), Enterprise Risk Management (ERM) encompasses the creation of protocols to handle associated risks, assessment of strategic options, and synchronization of risk strategy and desire with the entity's risk tolerance. Second, risk acceptance, sharing, avoidance, and reduction are just a few of the various risk approaches that ERM helps managers identify and choose from. Third, ERM lowers operational surprises and losses by strengthening an organization's ability to foresee future occurrences and deal with them head-on, hence lowering shocks and related expenses or losses. Fourth, any business faces a variety of risks that affect many organizational components. Firm risk management (ERM) offers comprehensive and efficient responses to various risks along with efficient responses to the consequences that follow. Fifth, ERM assists management in identifying and taking advantage of opportunities proactively by considering a broad range of potential outcomes. This makes it easier for management to do so. Sixth, by improving capital deployment through the acquisition of reliable risk information, management can assess total capital requirements and optimize capital allocation. Organizations can accomplish the entity's performance and profitability goals while preventing income loss thanks to the performance indicators in ERM. With the use of the ERM, management can guarantee adequate coverage, adherence to legal requirements, and protection against potential risks and harm to the entity's integrity. In summary, Enterprise Risk Management (ERM) enables an organization to achieve its goals while mitigating risks and unforeseen circumstances.

Previous Studies of Enterprise Risk Management: Since the 1990s, the field of enterprise risk management (ERM) has expanded and developed along with the use of ERM. It is believed that Miller's 1992 paper, "A Framework for Integrated Risk Management in International Business," was the first to be published in an academic journal on ERM. Miller limited the definition of risks in this conceptual study to the unpredictability or uncertainty of organizational outcome determinants. Miller presented a counterargument to the innovative method of managing risk independently of the other. Additionally, Miller popularized the integrated risk management approach, which accounts for a range of variables. In 1998, Robert Schneier and Jerry Miccolis, who are strategy and risk consultants at Tillinghast Towers Perrin, unveiled new ideas in risk management, which are referred to as enterprise risk management. They did so because they comprehensively addressed all the organization's major risks at the enterprise level. A new era in the field of ERM has now been brought about by a notable increase in interest in academic research on the subject. Some of the recurrent study topics in the ERM literature are the components of ERM adoption, the financial characteristics of ERM adopters, ERM practices, its impact on the value and performance of organizations, and, to a lesser extent, the effectiveness of ERM in risk management.

The engagement of senior management, which includes the Chief Risk Officer (CRO), the Board of Directors (BOD), and internal audit, is another area that seems to be being investigated. Previous research addressed a variety of topics, such as the origins and effects of ERM. For example, Holton (1996) discovered that when analyzing the components of ERM implementation, internal factors influence efficacy. The study's findings suggest that technology, organizational culture, and rules all have a big influence on risk management in companies. According to this study, BOD members and people alike need to be ready to handle risks associated with the corporate culture. Nonetheless, to comply with ERM, organizations also rely on procedures to modify current procedures. One of the first investigations of the factors influencing the use of ERM in businesses was carried out by Kleffner et al. (2003). The poll indicates that more than one-third of participants have put ERM into practice, and a higher proportion of the remaining participants are headed their way. Organizational structure and a general aversion to change were determined to be the primary barriers to the adoption of ERM. On the other hand, the strategy's advocates included the support of the Board of Directors, the impact of the Risk Manager, and adherence to Stock Exchange guidelines.

Beasley et al. (2009) stated that senior management and the board must take the lead in promoting the broad adoption of ERM. The study concluded that assessing the amount of ERM implementation also requires an understanding of other organizational features, such as size, industry, auditor type, and place of residence. To determine the financial characteristics of ERM adopters, early ERM studies are typically exploratory (Lam, 2000; Kleffner et al., 2003; Liebenberg & Hoyt, 2003; Pagach & Warr, 2007; Lin et al., 2012). For instance, Liebenberg and Hoyt (2003) found companies that use a lot of leverage are more likely to designate CROs. As a result, companies that bear greater risk are more likely to employ ERM. Similar conclusions are reached by Pagach and Warr (2007), who found companies that have a history of volatility, high debt levels, and underperformance in the stock market are more likely to utilize ERM. According to Lin et al. (2012), insurers with bigger reinsurance ratios and more varied geographic portfolios tend to use ERM more frequently. The study also found that insurers seem to purchase less reinsurance and have less volatility in their asset portfolios after implementing ERM while increasing their positions in derivatives.

This suggests that insurers reduce the costs associated with reinsurance and increase the costs associated with financial risk by using more derivatives and having less volatile asset portfolios. Research on ERM is still being conducted generally in Malaysia (Manab et al., 2010). For instance, Lai and Samad (2011) investigated how ERM affected organizational performance. Razali et al., (2011) divided the companies in the same year into two groups: (1) ERM adoption and (2) factors impacting ERM adoption. Meanwhile, a study was carried out by Soltanizadeh et al., (2014) to ascertain the extent of ERM adoption across Malaysian enterprises in various industries. Determining the degree of ERM adoption across Malaysian publicly listed firms is the aim of that study. The results from 199 businesses that are listed on the Bursa Malaysia showed that there are differences in ERM implementation between industries, with the infrastructure, hotel, and technology sectors using it the most. The earlier study demonstrated that different writers have examined the efficacy of ERM on many occasions, albeit they have focused on different industries and nations. The theme and dependent variable in this study will be the effectiveness of ERM; however, the research was limited to the manufacturing sector in Malaysia.

Enterprise Risk Management in SMEs: SMEs need to manage risks and create risk models to succeed in such a competitive market (Yang et al., 2018; Tan & Lee, 2022). On the other hand, the risks that put SMEs' competitive advantages in jeopardy are usually related to the creation of new niche competitors, globalization, laws, and innovative technology (Laforet & Tann, 2006). ERM helps them recognize opportunities, assess risks, and implement innovative business concepts. SMEs frequently have low financial and human resource availability, which further increases their susceptibility to external economic shocks (Rehman & Anwar, 2019). Such shocks may be lessened by ERM (Yang et al., 2018). Remember that ERM could add significantly to an SME's costs, further straining its already thin budget. Furthermore, entrepreneurs may be able to identify risks immediately without having to formalize or disclose information (Cantonnet et al., 2019). Therefore, ERM has no direct impact on SMEs' performance quality. It is critical to evaluate this underlying relationship between ERM and SMEs' performance since informal management techniques are prevalent in SMEs and applying ERM can be expensive (Brustbauer, 2014). Rehman and Anwar (2019) claimed that ERM research with SME samples is still in its infancy.

According to what is already known, ERM may moderate the creation of competitive advantages (Yang et al., 2018) and some ERM components may affect how well SMEs perform (Yakob et al., 2020). When participating in any informal decision-making process, keep in mind that most SMEs are family-run companies (Chua et al., 2012). Only 18% of manufacturing organizations experimentally adopt ERM and execute risk management in their strategic business activities (Yazid et al., 2012). According to earlier research, only 43% of publicly traded corporations utilize ERM (Wan Daud et al., 2010). Malaysia is still trailing behind in the ERM's adoption. Good risk management strategies therefore enable businesses to accomplish their objectives and increase the value of their stakeholders (Yazid et al., 2008). Furthermore, organizations can maximize profits by fully utilizing their resources with an effective ERM implementation (Yakob et al., 2020). In fact, according to the recently updated COSO ERM framework, integrating ERM across entities will provide several advantages, such as raising opportunities, recognizing, and controlling risks among entities, promoting favorable results and benefits, reducing unfavorable shocks, reducing performance variability, boosting resource utilization, and raising firm value. Businesses may efficiently control and reduce their risk exposure by implementing ERM, which helps the business achieve its objectives.

3. Discussion

A study by Abidin (2015) found that risk behavior and ERM have a big impact on R&D project success. Risk behavior would dictate how ERM is implemented because the two are interrelated. Therefore, it could have a favorable or negative impact on how ERM is implemented and how often R&D projects succeed. Promoting positive risk behavior in team members, project managers, and other stakeholders is essential to increase the efficacy of research and development projects. Furthermore, Ahmad (2014) demonstrated that risk behavior has a substantial impact on the ERM since it is individualized, subject to change, and can have a favorable or negative effect on risk. Because of this, it is very important to pay attention to employee behavior rather than merely protocol and law. In the oil and gas platform construction sector, employee beliefs, practices, and behaviors around risk need to be integrated into the organization's culture in addition to the successful application of risk management techniques. This needs to be continuously assessed. According to Trimpop (1994), risk behavior is any regulated behavior, whether conscious or unconscious, that is judged to be unclear in terms of its outcome and/or possible advantages or costs to the physical, financial, or psychological well-being of the individual or others. Danger behavior, according to Rohrmann (2004), is the actual actions people take when faced with danger.

In addition, Sitkin and Pablo (1992) defined risk behavior as the level of risk associated with making decisions. Cultural, psychological, habitual, and motivational factors are used to categorize risky behavior (van Winsen et al., 2011). A few of the studied hypotheses have something to do with risky behavior. According to Cyert and March's (1963) behavioral theory, an organization is a coalition of individuals. This indicates that a company is composed of a variety of people, such as shareholders, employees, and upper management. This aims to forecast decision-making procedures as well as organizational behavior. It can also anticipate and comprehend what supervisors or individuals do, as opposed to what they ought to do. It combines decision-making and development, which generates more concepts and inventions (Greve, 2003). According to behavioral theory, management will act differently to improve an acquired unit's performance when it deviates from

predetermined benchmarks. The idea that a manager's success rate is based on their actions or behaviors is another way to characterize the theory. In a roundabout way, this notion also inspires individuals to become outstanding leaders.

This idea emphasizes that managers' actions or the support of upper management will impact the performance of the organization when it comes to risk behavior. Organizational operations may be impacted by the degree of risk behavior and the response of top management to risk (Jung et al., 2020). According to Dewett (2006), risk behavior may change depending on the CEOs' leadership style. If risks are to be appropriately assessed and effectively managed, research must concentrate on the factors that lead to risky behavior in the workplace. Considering the organizational, economic, and societal changes that followed the 2008 financial crisis, a contemporary core issue is the need for a deeper understanding of the psychological aspects of risk management within organizations to design effective reward and recognition policies (Sartori, Ceschi, & Costantini, 2015). Furthermore, researchers have found that organizational structure is one of the most important success criteria for risk management in a company (Agoi, 2013); Banasadegh et al., 2014; Carey, 2011; Yaraghi & Langhe, 2011). Meanwhile, studies have also discovered that organizational structure plays a critical role in the effectiveness of risk management systems (Yaraghi & Langhe, 2011; Carey, 2011). The importance of organizational structure on the effectiveness of risk management in financial institutions is emphasized in the study.

Top Management Support: Regardless of whether the study is focused on ERM adoption or effectiveness, senior management support is the variable that is most frequently highlighted in ERM studies. Top management is necessary for effective risk management (Kaplan & Mikes, 2014). Effectiveness of ERM (Togok, 2016), risk management (Banasadegh, Riahi, & Davari, 2014; Cooper, Faseruk, & Khan, 2013; Maina, Mbabazize, & Kibachia, 2016; Ngundo, 2014), security risk management (Zafar et al., 2011), and risk management success (Agoi, 2013) are all directly correlated with top management support. Academic studies have indicated that one of the most important success factors for risk management is upper management support. For example, Agoi (2013) discussed the idea that commitment and leadership are crucial success factors for risk management. Banasadegh et al. (2014) investigated the significance of these factors for risk management in Iran's oil and gas industry while Zafar et al., (2011) presented the importance of executive management support for the goal of security risk management effectiveness. According to an empirical study by Ngundo (2014), risk management efficacy in Kenyan public housing construction projects is significantly and directly impacted by top management support. According to the findings of other researchers, such as Sax and Torp (2015), risk management performance is directly and significantly impacted by participative leadership styles.

Maina et al., (2016) found that the effectiveness of risk management in a public housing construction project in Rwanda is significantly and directly impacted by top management support. Additionally, the researchers found that poor support from upper management for the risk management process results in inadequate resource allocation, as well as poor participation and decision-making from upper management, all of which have an impact on the effectiveness of risk management. Furthermore, there is no direct effect and a negligible relationship between top management support and commitment and risk management effectiveness among Thai financial institutions. However, the findings do suggest that top management support and commitment are critical to effective risk management (Ranong & Phuenngam, 2009). Most studies looked at how top management support directly affects the dependent variables (Ngundo, 2014; Ranong & Phuenngam, 2009). On the other hand, several studies looked at the direct or indirect effects of top management support on the variables being studied (Togok, 2016). The results of a study by Togok (2016) showed that organizational culture has an indirect impact on ERM effectiveness, but tone from the top also has a substantial direct impact. Additionally, Ngundo (2014) discovered an indirect relationship—which is already mediated by organizational structure, procedures, and systems—between risk management efficacy and top management support. Consequently, this study's goal is to ascertain how top management support directly affects the efficacy of ERM.

Reward and Recognition: The impact of reward and recognition on the efficacy of ERM has not been thoroughly studied in the field of ERM studies. However, according to Carey (2011), who employs the Turnbull approach, compensation concerns are crucial to risk management. Because pay policies have an impact on employee conduct, the researcher highlights the importance of remuneration rules in an organization, such as

bonuses paid to staff. Consequently, it is critical to pay attention to an organization's reward and recognition programs since they have an impact on employee performance, which in turn has an impact on risk management performance. A study by Yaraghi and Langhe (2011) found a strong correlation between the performance of risk management systems and reward and recognition systems, classifying both as essential success criteria for risk management systems. Gibson (2012) found a substantial association between effective compensation and incentives on risk management adoption in South African financial services organizations, which validated the prior findings by Yaraghi and Langhe (2011). In line with the findings of Abdullah et al. (2007) regarding organizational achievement of the nation's electrical and electronic sector with reward and recognition, Abdullah et al. (2008) also discovered a significant and direct relationship between reward and recognition with the performance improvement among Malaysian electrical and electronic firms. Thus, the purpose of this study is to determine how reward and recognition directly affect the effectiveness of ERM.

Organizational Structure: While research on the effectiveness of ERM is scarce, most previous studies on the effects of organizational structure have focused on financial performance (Laisasikorn & Rompho, 2014), risk management success (Agoi, 2013), and effectiveness of risk management (Carey, 2011; Ngundo, 2014; Ranong & Phuenngam, 2009). Togok (2016) found no significant relationship between organizational structure and ERM effectiveness in publicly traded Malaysian companies. Previous research (Ranong & Phuenngam, 2009) demonstrated a noteworthy association between organizational structure and the use of risk management in Thai financial institutions, which further supports the findings. Various scholars have stated that organizational structure is a critical success factor for risk management in business (Agoi, 2013; Banasadegh et al., 2014; Carey, 2011; Yaraghi & Langhe, 2011). Carey's (2011) study, which emphasized the importance of organizational structure on risk management efficacy in financial institutions, supported Yaraghi and Langhe's (2011) discovery that organizational structure is a significant success factor for risk management systems.

Perceived Effectiveness in ERM Practices: To ascertain the proper match with organizational features, contingency research has identified ERM effectiveness as a necessary dependent variable (Otley, 1980; Merchant & Simons, 1986). According to Beasley et al. (2006), an effective ERM program must meet several conditions. The authors stated that incentive programs and performance monitoring should be incorporated into a strong ERM program. The following year saw the publication of a manual on best practices for creating an efficient ERM program (Collier et al., 2007), which serves to emphasize the need for an efficient ERM of risk management. The studies by Paape and Speklé (2011), Jalal et al., (2011), Arnold (2010), Gordon et al., (2009), and Collier et al. (2007) are among the few that discussed the successful implementation of ERM programming. According to Gordon et al., (2009), the relationship between ERM effectiveness and organization performance depends on how well it fits with a few firm-impacting contingency components. Collier et al. (2007) investigated efficient risk management techniques at the highest level of aggregation using wide categories of activities as independent variables. A study evaluating the effectiveness of risk management recommendations provided to local authorities found that there may be a chance to develop a will to adopt effective risk management if the concepts are firmly embedded in the operational procedures.

In their 2012 study, Paape and Speklé (2011) concentrated on the correlation between particular risk management decision-making and how it affected the perception of risk management methods' efficacy, finding a positive relationship between the two. Conversely, Arnold (2010) investigated how organizational structure and its capacity to adapt to changes in the volatile business environment are impacted by the strategic benefits of ERM techniques. The results show that an organization's strategic flexibility is strongly predictive of how effective its ERM practices are; this link is somewhat mediated by IT compatibility, or the capacity to access and use enterprise-wide data from all organizational systems (Arnold, 2010). Based solely on the stories of chief internal audit executives, the study may not be representative of the public and lacks a diverse viewpoint on the experiences of other chief executives. This is because the chief audit executives represent just one respondent, which introduces bias into the analysis. Overall, the study showed that integrating new regulatory standards is not too challenging for organizations that already have flexible organizational structures and effective ERM practices in place. Conversely, companies that do not have strong ERM procedures in place before the introduction of new rules found it more difficult to comply with the regulations and have poorer implementation strategies. The second study by Jalal et al. (2011) attempted to provide empirical evidence that the eight elements of the ERM framework developed by COSO (2004) are the requirements for an efficient and prosperous ERM project. Nevertheless, only four of the eight useful elements of a strong ERM are used by the researchers in their analysis (Jalal et al., 2011).

4. Significance and Contribution of Research

In this section, the relevance and contribution will be discussed in terms of both theoretical and practical components. Practically speaking, the researchers anticipate that the study's results will show that ERM significantly affects effectiveness and will provide industrial participants the confidence to use ERM in their operations. The methodology in this study is anticipated to uncover gaps between ERM's strengths and limitations which help and encourage its implementation in the manufacturing sector. Therefore, for Malaysia's SME manufacturing industry to thrive in the global market, effective ERM implementation is essential. The results of the study will guarantee a thorough comprehension of the function of ERM in the expansion and advancement of businesses. It is anticipated that the researcher and practitioners will both profit from the findings. In addition, this study adds Knowledge Management (KM), a novel variable and mediator in the ERM framework that is absent from earlier studies. It is thought to play a role in the process of risk behaviors and enhance the efficacy of ERM procedures. It also yields important findings for governments, business, and academia. Corporate governance regulatory bodies may utilize these results to develop new policies and procedures governing an organization's risk management procedures. In addition, the results will show how Malaysians, both in the country and across all industries, have adopted ERM in comparison to other emerging nations worldwide.

To make a theoretical contribution, the current study uses KM as a mediator to examine the relationship between risk behaviors and their effects on effectiveness. The results will aid in the comprehension of ERM in the manufacturing industry for SMEs in Malaysia. This study will validate and offer empirical evidence to support the findings in academia. The created and proven hypotheses of this study will fill a research gap by offering a dependable and verified framework and source material. This study aims to examine how risky behaviors affect the efficacy of ERM procedures. Additionally, a mediator is found, with a particular focus on the manufacturing industry. Research on ERM in developing nations will advance the understanding of ERM generally which could help to create a unique ERM framework. To meet new business difficulties, the application of ERM practices has been enhanced. To obtain more proof of the efficacy of ERM, certain writers have emphasized the significance of empirical research (Razali et al., 2011; Wan Daud et al., 2010; Rasid & Rahman, 2009; Pagach & Warr, 2010). Unlike earlier research, this study offers a thorough framework that considers mediators in the relationship between risk behaviors and the efficacy of ERM practices in the Malaysian setting. However, there are not many empirical studies—especially in the manufacturing sector—that look at the connection between risky behavior and the efficacy of ERM methods.

5. Conclusion and Recommendations

In conclusion, this paper has provided a comprehensive overview of ERM practices in Malaysian SMEs. Through the examination of previous studies, it becomes evident that while there is a growing body of literature on ERM, there remains a significant gap in research specifically tailored to the SME sector in Malaysia. This underscores the need for further empirical investigation to deepen the understanding of how ERM is implemented and perceived, and its impact within this vital segment of the Malaysian economy. Furthermore, the discussion highlighted the myriad of benefits that effective ERM implementation can bring to SMEs in Malaysia. From enhancing decision-making processes to improving operational efficiency and financial performance, ERM enables SMEs to navigate uncertainties and seize opportunities with greater confidence. By fostering a risk-aware culture and integrating risk management into strategic planning, SMEs can build resilience and adaptability, thereby enhancing their long-term sustainability and competitiveness in the marketplace.

The effectiveness of ERM within SMEs is contingent upon various factors, as discussed. Foremost among these is top management support. Without strong endorsement and commitment from senior leadership, ERM initiatives are likely to falter. Therefore, SMES must cultivate a culture of risk awareness from the top down, where executives champion risk management efforts and allocate necessary resources for their implementation and sustenance. Moreover, the role of reward and recognition mechanisms cannot be overstated in driving ERM effectiveness within SMEs. Incentivizing and acknowledging employees' contributions to risk management efforts can serve as powerful motivators, fostering greater engagement and commitment across all levels of the organization. By tying performance metrics to risk management goals, SMEs can align individual and organizational objectives, reinforcing the importance of ERM in achieving

business success.

Additionally, the discussion emphasized the importance of organizational structure in facilitating ERM effectiveness. A well-defined and integrated organizational structure enables SMEs to streamline risk management processes, enhance communication and coordination, and allocate resources efficiently. By embedding risk management responsibilities into job roles and delineating reporting lines, SMEs can ensure accountability and transparency in their ERM practices, driving continuous improvement and resilience-building efforts. In summary, while challenges may exist in implementing and optimizing ERM practices within Malaysian SMEs, the potential benefits are significant. By leveraging the insights gleaned from previous studies and prioritizing top management support, reward and recognition, and organizational structure alignment, SMEs in Malaysia can harness the transformative power of ERM to mitigate risks, capitalize on opportunities, and achieve sustainable growth in an ever-evolving business landscape.

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Factors Influencing Tourists' Satisfaction on Electric Train Service (ETS)

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Abstract: This study investigates the use of Electric Train Services (ETS) railway service by tourists. It seeks to understand factors influencing tourists' satisfaction with ETS train services. Data were collected from a survey with convenience and purposive sampling by selected tourists in ETS station in Kuala Lumpur Sentral. Theoretical frameworks for research units like the four dimensions of the level of satisfaction (accessibility, service quality, traveling comfort, cost). 213 respondents were gathered through a combination of a direct approach and an online survey using Google Forms. The data collected was analyzed using SPSS 27 and Excel. The findings revealed strong correlations between all the listed aspects and tourist satisfaction. Overall, tourists were highly satisfied with the ETS train services at KL Sentral. Consequently, this study contributes to our understanding of how tourists perceive and experience the ETS service. The conclusion of the study delves into the results obtained and explores potential implications and future possibilities.

Keywords: *Electric Train Services (ETS), Tourist Satisfaction, Railway, service quality*

1. Introduction

Public transport is a critical component of the tourism industry, as it is often the primary means of transportation for visitors to a destination. It plays a vital role in ensuring that tourists can easily move around a city or region and access the various attractions, activities, and amenities that the destination has to offer (Truong & Shimizu, 2017). Besides, the growth of the tourism industry has led to increased pressure on cities to provide efficient and sustainable transportation services to accommodate the increasing number of visitors (Hall et al., 2017). With the trend towards smart cities, the development of public transportation services has become a crucial aspect in creating a sustainable and attractive tourist destination.

According to the United Nations World Tourism Organization (UNWTO), the availability and accessibility of public transport are essential elements in creating a positive tourist experience. Public transport systems can help reduce congestion on roads and minimize the environmental impact of tourism activities (Hashim et al., 2019). Additionally, tourists who use public transport are often more likely to interact with locals and immerse themselves in the local culture, leading to a more authentic travel experience (Westcott, 2015).

Railway trains are considered one of the basic forms of public transport that can deliver services to tourists or locals. Public transportation systems, such as railways, are an integral component of the public transport network that plays a crucial role in mitigating traffic congestion, particularly during rush hours and holiday seasons (Mohamad, 2022). Minimizing stop-and-go driving and decreasing fuel consumption, not only saves passengers' time and energy but also reduces traffic congestion. Railway trains play a significant role in the tourism industry, offering a unique and enjoyable way for tourists to explore different destinations. On the other hand, there is another term that can relate to the railway and tourism industry which is railway tourism. According to Blancheton & Marchi (2013) and other sources, railway tourism is a form of travel in which the train not only serves as a means of transportation to a location but also serves as the destination itself (Lee & Chen, 2016).

Previous studies have stated that trains have problems in terms of service quality, comfortability, and accessibility. According to Khalid et al. (2014), there has been a notable dissatisfaction among passengers regarding the quality of service provided by the Keretapi Tanah Melayu Berhad (KTMB), particularly in terms of train punctuality and frequency. Passengers have expressed their disappointment and frustration over the unreliability of train schedules. In 2022, ETS had a problem with a power outage that involved disruption of the line's electricity which caused a force stop of the train (Focus Malaysia, 2022). According to Bezyak et al. (2017) in their research, almost half of respondents with disabilities and senior citizens are dissatisfied with the public transportation system. Whether buses, taxis or trains, it still lacks ramps for the elderly and disabled

who use wheelchairs when traveling (New Straits Times, 2015). Therefore, this study aims to determine the factors influencing tourists' satisfaction with ETS train services.

2. Literature Review

Tourist Satisfaction: According to Oliver (1997) as cited in (Saayman et al., 2018), tourist satisfaction is defined as a determination that a feature of a good or service, or the good or service itself, offered a delightful level of consumption-related fulfillment, including levels of excess and under fulfillment. Satisfaction is a component of attitude that persistently predicts loyalty (Mohamad, 2022). Ercan et al. (2023) stated tourist satisfaction has been studied for decades by researchers who applied a variety of approaches to examine tourists' satisfaction levels. Cao & Cheng (2012) mentioned Pizam, the earliest researcher on tourist satisfaction because of the comparison between the expectations of tourist destinations and the actual conception after arriving. In another study, tourist satisfaction is defined as what a tourist feels about the service after experiencing it (Eltayeb, 2017). According to Virkar & Mallya, (2018), several elements, such as expectations generated before and during the trip as well as the tourists' perceptions of the services obtained, may contribute to tourist satisfaction. According to previous studies that have been done, tourist satisfaction will be affected by several factors in the aspects of product, service, brand or business. According to Saporna et al., (2012), the amenities and facilities offered by the provider of train services are made available for the passengers' satisfaction. SERVQUAL method has been used to measure customer satisfaction in various contexts. In addition, service quality measurement has been studied previously in the same context of railway service, but at other locations and for different applications. For instance, studies found that reliability, responsiveness, and tangibles (SERVQUAL attributes) are important factors influencing customer satisfaction among KTMB users in Penang (Abdul Rahim & Mohamad Nor, 2021; Omar et al., 2022). However, in this research, we measure the level of satisfaction with ETS service that influences tourists.

Accessibility: Accessibility is an important aspect of rail journeys with influence on the overall satisfaction of the traveler (Yanık et al., 2017). Accessibility is one of the important factors in train services as it can bring changes to transport, economy and social life (Jamaludin et al., 2022). A famous city like Kuala Lumpur, Ipoh Johor Bharu is a common attraction city among local tourists and international tourists to plan for their visit to Malaysia. Due to the variety of connections available between stations, it is crucial to accurately advise passengers on the schedules, routes, and transfers for both metro-rail services (Ercan et al., 2023) and the accessibility of navigation within the stations themselves (Zhai et al., 2021). According to Le-Klähn & Hall (2014), accessibility is the third highest dimension in the study which comes after traveling comfort and service quality. The dimension of the study focuses on the stations and the vehicle itself. According to Ercan et al. (2023), using screen displays for schedules, train departures/arrivals, route information, route map(s), announcements in stations during and after breakdowns, and announcements in trains during travel can increase the accessibility of rail service. However, this study measures the level of accessibility based on the following criteria: accessibility of train stations, guidance in trains, easier transfer within trains and stations, staff service and amenities.

Service Quality: According to Wang et al., (2020), many researchers are dedicated to assessing the service quality of public transport from the passengers' perspective and identifying the preferred aspects of the service, as it is regarded as a comprehensive measure of travel behavior. According to (de Oña, 2020) in general, service quality is linked to attributes of the service, such as frequency, cleanliness, comfort, and speed, while satisfaction is connected to more intricate perceptions and affective evaluations, encompassing factors like liking, feeling, and pleasure. Furthermore, although most people believe that service quality is a factor in determining customer satisfaction, there is debate over the type of relationship that exists between satisfaction and behavioral intentions. Service quality is always the main issue when it comes to public transport (Mohamad, 2022). Most passengers expressed dissatisfaction with the level of service in terms of the punctuality of train arrival and departure (Mat et al., 2019). It always influences the level of satisfaction experienced by users when using a service based on experience. Service quality or SERVQUAL instruments have been used and tested in many studies to determine the level of satisfaction of consumers. In railway studies, measuring service quality for public transport has two dimensions: the first would be the objective dimension, whereby, service quality is objectified in performance indicators such as frequency and speed while the subjective dimension measures service quality through consumer judgments (Eltayeb, 2017). A study in

Indonesia states that RAILQUAL was used on intercity trains in the country, such as platform and in-train services, found punctuality (reliability), employee services, and security (assurance) significantly influenced satisfaction among their respondents (Ali et al., 2022). Based on Le-Klähn et al. (2014) studies, punctuality, reliability, network connection, and service frequency were highly appreciated characteristics of public transport in Munich.

Travelling Comfort: Some researchers stated that comfort has been considered one of the main variables that affects the loyalty and satisfaction of rail transit passengers (Ercan et al., 2023). According to a study, traveling comfort is an important service dimension and it contains the requirements for vehicles such as space, cleanliness, seat availability, and safety as well as stations (Le-Klähn et al., 2014). Other studies found comfort level was assessed based on factors such as seat size, cleanliness, and noise, and the findings strongly indicated that the level of comfort significantly influences traveler satisfaction and loyalty (Ercan et al., 2023). According to Cao & Cheng (2012) studies, cleanliness and comfort of high-speed train compartments are the most satisfactory factors for tourists, especially long-distance tourists, train compartment cleanliness and comfort affect the travel effects and the quality of travel. A study by Mohamad (2022) showed that the comfort and cleanliness of trains had an impact on the most attractive feature of using the ETS system. Other studies stated providing passengers with comforts like cleanliness and air conditioning enhances their traveling satisfaction (Abdul Rahim & Mohamad Nor, 2021; Omar et al. 2022).

Cost: Cost can significantly influence the level of satisfaction with train services, presenting another crucial factor to consider. Numerous research now in existence concentrates on the effects of differences in transportation costs on travel satisfaction (Zhai et al., 2021). According to Ibrahim et al. (2020), authors stated that to convince the public to use the service, service authorities must concentrate on crucial ticket prices. Furthermore, the authors explain one of the key factors affecting how satisfied a customer is with any public transportation service is the cost of the trip. According to Le-Klähn & Hall (2014), price is a crucial determinant in visitor choice and satisfaction with public transportation, necessitating appropriate and appealing pricing to motivate passengers. Ercan et al., (2023) stated in the study that a price-quality ratio can be thought of as the basis for the charge as a measure of tourist satisfaction, and they can assess the fee's value based on the quality of the service they receive. The authors explain more if the price tourists pay for the ticket meets the expectation of quality service from their perspective, the result will be satisfied. Otherwise, it should be low or none. Le-Klähn et al. (2014) studies found that ticket price is one of the most important items to visitor satisfaction with public transport. According to Virkar & Mallya (2018), the authors stated previous study has investigated a relationship between price value and tourist' satisfaction. Furthermore, it explained that price plays an important part in tourist satisfaction and decision-making. However, other studies stated that customer satisfaction is a result of purchase, the result of the contrast between the cost to purchase products (such as money, time, and effort) and the product's effectiveness (Cao & Cheng, 2012).

3. Research Methodology

The research data collected for this study was collected at the ETS departure platform in Kuala Lumpur Sentral, by surveying the tourists of the area. The participants in this study were those who used the ETS train in Kuala Lumpur. The sample for this study included tourists. Convenience sampling was used because of the availability of the respondent and their willingness to answer the questionnaire. This allows group members to collect data from a large sample of people at one point in time during the event. The survey questionnaire is distributed physically, with respondents being approached by the researcher at Kuala Lumpur Sentral to complete the survey by scanning the provided QR code, which would take them directly to the survey questionnaire's site. To facilitate analysis, the quantitative data was initially coded and imported into SPSS. The correlation coefficient was utilized to assess the relationship between variables, aligning with the research objective of the study.

4. Results

Table 1: Demographic Analysis

	Category	Frequency	Percent (%)
Age	18 – 29 years old	169	79.3
	30 – 45 years old	23	10.8
	46 – 60 years old	12	5.6
	61 years and above	9	4.2
Gender	Male	50	23.5
	Female	163	76.5
Marital Status	Single	171	80.3
	Married	40	18.8
	Divorced	1	0.5
	Others	1	0.5
Employment	Public	24	11.3
	Private	19	8.9
	Own Business	8	3.8
	Student	151	70.9
	Unemployed	10	4.7
	Others	1	0.5
Type of visitor's status	Domestic tourist	207	97.2
	International tourist	6	2.8
I use ETS to	Visit tourist spots	13	6.1
	Travel to different states	193	90.6
	Others	7	3.3
Preferred mode of transport when I travel in Malaysia (ground)	Car	91	42.7
	Bus / Coach	8	3.8
	Train	114	53.5

Demographic Analysis: Based on Table 1, it was found that 76.5% or 163 individuals, identified as female, and 23.5% of respondents, equivalent to 50 individuals, identified as male. In terms of age, 79.3% or 169 individuals fell within the age range of 18 to 29. The age range of 30 to 45 years old accounted for 10.8% of the respondents, with 23 individuals. The age range 46 to 60 years old represented 5.6% of the participants, with 12 individuals. The remaining 4.2% of the respondents, corresponding to 9 individuals, were aged 61 or older. Next, 80% or 171 individuals reported being single. The second highest category was married couples, with 40 individuals, accounting for 18.8% of the total respondents. The remaining categories, including divorced and others, each represented 0.5%, with one individual falling into each of those categories. In terms of employment status, 70.9% of the total 151 participants, identified themselves as students, and the public sector was reported to employ 24 individuals, which accounted for 11.3% of the respondents. On the other hand, the private sector employed 19 individuals, representing 8.9% of the respondents. Approximately 3.8% indicated they were involved in their own business or self-employed. Additionally, 4.7% of the respondents were unemployed, indicating that they were actively seeking employment but currently without a job. Finally, a negligible percentage of 0.5% fell into the "Others" category, which likely includes individuals who did not fit into any of the specified employment categories mentioned earlier. Based on the data, a significant majority of 207 individuals, which accounts for approximately 97.2% of the participants, were identified as domestic tourists. On the other hand, a much smaller proportion of the respondents, specifically 6 individuals, representing approximately 2.8% of the remaining participants, were classified as international tourists and as for the motive to use ETS, 193 individuals, which accounts for 90.6% of the total respondents, stated that they use the ETS (Electric Train Service) for traveling to a different state. 13 individuals, or 6.1% of the respondents, reported using the ETS for visiting tourist destinations. 7 individuals, or 3.3% of the respondents, mentioned other reasons for using the ETS. For transportation mode preference within Malaysia, a total of 114 individuals, accounting for 53.5% of the respondents, indicated that they preferred the train as their mode of transportation. The second most preferred mode of transportation was the car, with 91 individuals, representing 42.7% of the respondents, choosing it as their preferred option. Following closely behind was the bus/coach, which was preferred by 8 individuals, making up 3.8% of the respondents.

Descriptive Analysis: Table 2 provides the results that describe the mean score for accessibility, service quality, travel comfort, cost, and overall satisfaction.

Table 2: Descriptive Analysis

Item	Mean	Std. Deviation
Accessibility		
ETS train services are convenient for tourists.	4.57	.551
ETS stations are connected to many significant tourist spots.	4.21	.751
ETS train network connection is connected to important cities.	4.35	.716
ETS stations provide adequate parking areas.	3.75	.868
ETS station provides shuttle services for transfer to other destinations.	4.08	.912
ETS station provides facilities to people with disabilities.	4.33	.805
Service Quality		
ETS train is punctual.	4.45	.742
ETS train is very reliable.	4.52	.611
ETS train frequency of service is adequate.	4.12	.869
ETS train schedule is convenient for tourists.	4.31	.738
ETS train network connectivity is flexible.	4.20	.784
ETS staff service responsiveness is good.	4.33	.642
Information changes on the train schedule are updated.	4.15	.777
Travel Comfort		
ETS seating availability is adequate.	4.11	.912
ETS seating is comfortable for long-distance rides.	4.06	.945
ETS train space is comfortable.	4.19	.865
ETS train space is clean.	4.40	.634
ETS train ambiance is good.	4.32	.722
Cost		
ETS stations provide comfortable space for waiting.	4.14	.874
I feel safe traveling on the ETS train.	4.56	.543
ETS ticketing pricing is affordable.	4.06	.734
ETS price is cheaper than other modes of transport available to go to my intended destination.	3.74	.970
Overall Satisfaction		
Overall, I'm satisfied with ETS services.	4.46	.586
I will use ETS services again in the future.	4.61	.536
I will recommend ETS services to family and friends.	4.56	.601

Accessibility: The item "ETS train services are convenient for tourists" received the highest mean score of 4.57. This high score suggests that tourists generally agree with the statement that ETS train services are convenient for them. It indicates that most respondents perceive the ETS train services as a convenient mode of transportation for tourists. On the other hand, the item "ETS stations provide adequate parking area" received the lowest mean score of 3.75. This lower score indicates that tourists are not as confident in the availability of adequate parking areas at ETS stations. It suggests that there might be room for improvement in providing sufficient parking facilities for tourists at ETS stations.

Service Quality: It is evident that tourists have a strong positive perception of the ETS train, as indicated by the highest mean score of 4.52. This suggests that tourists find the ETS train to be dependable and trustworthy for their travel needs. On the other hand, tourists expressed disagreement with the statement regarding the adequacy of the frequency of ETS train services, as it received the lowest mean score of 4.12. This implies that tourists feel that the frequency of train services offered by ETS is not sufficient to meet their travel

requirements or preferences. They may perceive a need for more frequent train schedules or better availability of train services.

Travel Comfort: Tourists have a positive perception of the safety of traveling on the ETS train, as indicated by the highest mean score of 4.56. This suggests that tourists generally feel secure and protected during their journeys on the ETS train. However, it is worth noting that the lowest mean score of 4.06 suggests that tourists are slightly less satisfied with the comfort of the seating on the ETS train, particularly for long-distance rides. This indicates that there may be room for improvement in terms of providing more comfortable seating options to enhance the overall travel experience for passengers on long journeys.

Cost: The data shows that tourists generally agree that the pricing of ETS tickets is affordable, as evidenced by a mean score of 4.06. However, when comparing the pricing of ETS tickets to other available modes of transportation to reach their intended destination, tourists indicated a slightly lower perception of affordability. The mean score for this aspect was 3.74, suggesting that tourists believe other modes of transport may be cheaper or more cost-effective compared to ETS for reaching their desired location.

Overall Satisfaction: Tourists generally have a positive perception of ETS services and their willingness to use ETS services again in the future is strong, as indicated by a high mean score of 4.61. The lowest mean score of 4.46 suggests that tourists are not satisfied with ETS services.

Table 3: Correlation Analysis

		IV1	IV2	IV3	IV4	DV1
Accessibility	Pearson Correlation	1	.621	.583	.342	.611
	Sig. (2-tailed)		.001	.001	.001	.001
	N	213	213	213	213	213
Service Quality	Pearson Correlation	.621	1	.671	.301	.654
	Sig. (2-tailed)	.001		.001	.001	.001
	N	213	213	213	213	213
Travel Comfort	Pearson Correlation	.583	.670	1	.513	.715
	Sig. (2-tailed)	.001	.001		.001	.001
	N	213	213	213	213	213
Cost	Pearson Correlation	.342	.301	.513	1	.439
	Sig. (2-tailed)	.001	.001	.001		.001
	N	213	213	213	213	213
Overall Satisfaction	Pearson Correlation	.611	.654	.715	.439	1
	Sig. (2-tailed)	.001	.001	.001	.001	
	N	213	213	213	213	213

Correlation: The results presented in Table 3 demonstrate the associations between several factors, namely accessibility (IV1), service quality (IV2), travel comfort (IV3), and cost (IV4), with overall satisfaction (DV1). The findings from the study indicate that these factors are related to overall satisfaction to varying degrees. According to the data, there is a moderate correlation coefficient of 0.611 between accessibility and overall satisfaction. This correlation is statistically significant, as indicated by a p-value of 0.001. These results suggest

that accessibility has a meaningful relationship with overall satisfaction. Similarly, the correlation between service quality and overall satisfaction is moderate, with a coefficient of 0.654. This correlation is also statistically significant, with a p-value less than 0.001. Hence, the study indicates that service quality significantly influences overall satisfaction. Furthermore, the correlation between travel comfort and overall satisfaction is found to be strong, with a coefficient of 0.715. The statistical analysis confirms that this relationship is significant ($p < 0.001$). These findings highlight the close connection between travel comfort and overall satisfaction. Regarding cost, the correlation coefficient is 0.439, indicating a moderate correlation with overall satisfaction. The statistical analysis further supports this relationship as significant ($p < 0.05$). Consequently, the study suggests that cost plays a moderate role in influencing overall satisfaction. In summary, the results from this study indicate that accessibility, service quality, travel comfort, and cost are all correlated with overall satisfaction. However, the strength of these associations varies, with travel comfort having the strongest correlation, followed by service quality, accessibility, and then cost. These findings emphasize the importance of these factors in shaping overall satisfaction in the context of the study.

5. Discussion and Recommendations

This research aims to identify the factors that contribute to tourist satisfaction with the Electric Train Service (ETS) and focuses on four variables: travel comfort, service quality, accessibility, and cost. Firstly, service quality is the most significant factor leading to tourist satisfaction which is supported by previous findings (Mohamad, 2022) and reliability of ETS trains is the most satisfied dimension in tourist satisfaction. Next, in these studies, the second most significant factor is traveling comfort also supported by (Le-Klahn et al., 2014; Ercan et al., 2023) and the safety of the trains is the most satisfied dimension based on tourist satisfaction. However, Le-Klahn et al. (2014) study, traveling comfort, cleanliness of vehicles and space on vehicles are the most significant dimensions based on visitor satisfaction. Besides, Ercan et al. (2023) noise level, ventilation, and crowdedness as significant dimensions of passenger's comfort level. Furthermore, accessibility is the third most significant factor leading to tourist satisfaction and ETS trains are convenient to tourists is the most satisfied dimension in accessibility. According to Le-Klahn et al. (2014) and Ercan et al. (2023), in their studies also they found that accessibility is one of the important factors that related to tourist satisfaction. Lastly, the cost result does not give an excellent result like the rest because these studies found that the correlation between overall satisfaction is moderate. However, in studies, Le-Klahn et al. (2014) and Ercan et al. (2023) studies stated that fee or ticket price is the most significant dimension to shape the experience satisfaction of people who use public transport and necessitating clearer pricing systems, including smart ticketing, to promote usage among locals and tourists, despite concerns about high prices in Munich compared to other European cities.

To point out, the objective of this study is to gain a deeper understanding of the factors that influence tourists' decision to use the ETS service within a unified theoretical framework. The findings of this study, based on the Le-Klähn et al. (2014) dimension, demonstrate a positive correlation with tourists' overall satisfaction. The survey results reveal that a significant number of respondents consider travel comfort as a crucial factor influencing their decision to use ETS services. The findings indicate that tourists feel comfortable while using ETS services, despite the potential influence of other factors. The study also suggests that service quality has a positive impact on tourist satisfaction, and the data supports this claim. However, the decision to expand services may be influenced by various factors, such as financial considerations and budget constraints. Nonetheless, one potential solution could involve offering more services on major tourist routes. The findings suggest that accessibility and cost also play significant roles in their effects on tourist satisfaction. The study has examined the overall framework of tourist satisfaction and explored its theoretical and practical implications.

In conclusion, this study focused on identifying the factors contributing to tourist satisfaction with the Electric Train Service (ETS) and explored their impact within a unified theoretical framework. The findings revealed that factors such as travel comfort, service quality, accessibility, and cost have significant influences on tourist satisfaction. The results supported the hypotheses related to travel comfort and service quality, emphasizing their positive correlations with overall satisfaction. The study also recommended practical measures to enhance the ETS service, such as increasing seating allocation at waiting areas and improving parking facilities for tourists. However, the research encountered limitations, including a limited time frame and restricted data

collection opportunities, which affected the breadth and diversity of insights gathered. Despite these constraints, the study aimed to provide valuable insights into improving tourist satisfaction with the ETS service. The findings provide valuable insights for ETS operators and policymakers to improve the service and meet tourists' needs and expectations. Future research can address the limitations encountered in this study and further expand the understanding of tourist satisfaction with railway services.

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The Mediating Role of Social Media Usage as a Learning Tool on Students' Academic Performance: A Structural Equation Modelling (SEM-AMOS) Approach

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Abstract: Social media is used in many aspects of modern life. Lately, higher education has also expanded its focus to include globalized online learning using social media. Educational establishments have acknowledged that social media gives students a chance to interact with teachers, other students, and higher authorities. However, there is little information available on it in educational settings, especially in the classroom. Only a small number of studies in Malaysia have specifically examined social media, even though many studies have looked at how social media influences the academic performance of university students. Therefore, we conducted this quantitative study to determine whether social media usage mediates the relationship between educational variables and academic performance among students enrolled in Malaysian public higher education institutions. We conducted a cross-sectional study at UiTM Segamat, involving 388 respondents. The findings demonstrate that social media usage mediates the relationship between students' performance and perceived usefulness, perceived enhanced communication, and resource sharing. Social media use does not mediate perceived ease of use, collaborative learning, or perceived enjoyment of students' performance. To use social media as a teaching tool, particularly in higher education institutions, the research findings bring new knowledge to the field. The higher education community may share knowledge anytime and anywhere. This platform allows educators and students to interact with one another after learning sessions, which will help the student succeed academically.

Keywords: *Social media, student performance, learning tool, mediation*

1. Introduction and Background

Social media platforms have become common in many aspects of life in our global society. According to Selwyn (2012), a social media application enables users to categorize, identify, and recommend previously created information in addition to producing, editing, and sharing original textual, visual, and audio content. Nawir, Herman, & Bo'do (2024) asserted that social media has evolved into a crucial tool for exchanging ideas and knowledge, as well as for fostering interpersonal connections; in particular, interaction now forms a fundamental aspect of social media, rather than merely a byproduct of the platform. People now rely more on sites like Facebook, Instagram, Twitter, WhatsApp, Telegram, and TikTok for social networking, entertainment, and information gathering because of social media's explosive expansion in recent years. Lately, higher education has also expanded its focus to include globalized online learning. Social media is one of the most significant online resources for connecting individuals and encouraging the sharing and receiving of knowledge. Social media is an internet platform where people can communicate and share knowledge. It also refers to a platform where teachers and students can share text, visual, and audio content for teaching and learning activities.

Higher education institutions, including universities, have realized that social media gives students a platform to interact with teachers, other students, and the administration. As stated by Ilakkuvan, Johnson, Villanti, Evans, & Turner (2019) young adults use social media for more than three hours a day on average. Simultaneously, advancements in technology have brought about a significant transformation in the

educational experience of university students, as these technologies have facilitated easier communication and teamwork (Lavidas, Papadakis, Manesis, Grigoriadou, & Gialamas, 2022, Tülübaş, Karakose, & Papadakis, 2023). Students also use social media platforms for a variety of purposes, including information access, group discussions, resource sharing, and enjoyment. This sparked a discussion about their use, as well as the potential short- and long-term benefits and drawbacks. Numerous studies have shown that students' use of social media can have both positive and negative effects. According to Kolhar, Kazi, & Alameen (2021), 97% of the students' use of social media was addictive; 57% were addicted to it; and only 1% used it for learning. This gives an idea of the vast volume of social media usage and its effects on college students. Other research has also examined various aspects of social media use and its impact on college students. A nationwide study (Shensa, et al., 2017) linked high social media use to depression. Another study (Martin, 2017) found that almost half of university students in Malaysia stated that their preferred educational experience was an always-on learning environment that gave them access to learning materials from any location and on any device. Furthermore, another survey found that social media has evolved into an opportunity for less formal, two-way contact between students, potential students, teachers, and institutions. Teachers utilize these tools to establish professional learning communities and disseminate captivating content about the subjects their students are learning in class (Parr, 2014).

Researchers have conducted numerous studies to investigate the impact of students' social media usage on their academic performance. Social media has an impact on academic life for students in higher education, according to a survey by Hill, et al., (2024). According to Boateng & Amankwaa (2016), students in higher education frequently use social media, and those who responded to the study felt that social media had a significant impact on how their academic lives developed. This demonstrates how important and necessary social media use is to students' academic success today. Chowdhury (2024) shows that social media plays a crucial role in fostering communication, information sharing, and content creation among university students in Bangladesh. Although social media is becoming more and more important, research on its actual effects on learning is lacking, and social media use in higher education is still in the early stages. There are few publications about the use of social networking sites in learning environments, especially in the classroom. Only a few studies have specifically examined social media usage in Malaysia, even though numerous studies have looked at how social media affects university students' academic performance. We do not fully understand the extent to which social media acts as a mediator in influencing students' academic achievement. It is essential to consider the possible effects of social media on student academic performance. Therefore, we conducted this quantitative study to examine the mediating effects of social media usage on the relationships between educational variables and academic performance among students enrolled in public higher education institutions.

2. Literature Review

Student Academic Performance

Nowadays, social media use significantly impacts daily life, particularly for university students, who frequently use it as a learning tool to enhance their academic performance. The grade point average (GPA) can theoretically serve as an indicator to measure academic performance. GPA is defined as a measurement of academic achievement and the accomplishment of pedagogical objectives (Alghamdi, Karpinski, Lepp, & Barkley, 2020). Mehra, Gupta, & Avikal (2023) evaluate academic performance using scores, grades, marks, and CGPA from both curricular and extracurricular activities. Meanwhile, Kumar, Agarwal, & Agarwal (2021) propose that academic performance encompasses learning new information, developing abilities and skills, achieving excellent grades, advancing in a professional career, and demonstrating a desire and commitment to further education.

Numerous studies have examined the variables affecting students' academic achievement. Affuso, et al. (2023) found a positive association between student academic achievement and parental supervision and educator assistance. However, interactions with Internet use, perceived stress, and a poor diet seem to hurt academic performance (Maniaci, et al., 2023). Many studies have indicated that, due to COVID-19, only online learning readiness has a significant association with academic performance among college or university students (Wang, Xia, Guo, Xu, & Zhao, 2023). Students' cognitive engagement and academic performance are highly affected by their attitude, motivation, self-efficacy, and technological use (Aguilera-Hermida, 2020).

Social Media Usage

Technology has helped to create flexible educational possibilities that allow students to learn remotely through many platforms, such as social (Alghamdi, Karpinski, Lepp, & Barkley, 2020). Bonsaksen, et al., (2023) specifically, measure social media use by the amount of time students spend on it within a given time frame. The average social media use is considered to be less than 3 hours per day (Bruggeman, Van Hiel, Van Hal, & Van Dongen, 2019).(Course-Choi & Hammond (2021) define social media usage as the use of online community-building platforms for communication, information and data exchange, and amusement with both friends and strangers.

The relationship between social media use and academic achievement is a topic of significant debate. According to a study by Zhao (2023), university students who use social media excessively run the risk of developing a social media addiction and seeing a decline in their academic performance. Yao & Wang (2023) reported similar results, stating that excessive smartphone use and information overload are positively connected with technostress. Technostress, in turn, influences bad sleep quality and the perception of one's academic achievement. However, (Sabah (2023) found that social media use and education enhance learning, raise students' satisfaction with their education, and improve students' judgments of their performance. In addition, Alneyadi, Wardat, Alshannag, & Abu-Al-Aish (2023) recommended that smart applications such as social media can improve children's understanding of scientific concepts; thus, parents and teachers should encourage their use.

Collaborative Learning

Social media-based collaborative learning and teaching have drawn a lot of interest from educators. There are both positive and negative effects of social media-based collaborative learning and teaching on academic achievement, as shown by several studies that have investigated this issue. According to Al-Adwan, et al. (2020), an activity is a procedure in which a group of students works together to accomplish certain tasks, including problem-solving, in a more participatory setting. According to Chowdhury (2024), overusing social media negatively affects students' perceptions of their academic accomplishments by lowering academic engagement, increasing distraction, and decreasing study time. Chowdhury (2024) claimed that social media gives students a forum to express their ideas, get feedback on their work, and connect with individuals from other backgrounds, all of which help them become better communicators. Students who use social media can develop their critical thinking abilities. Engaging in online dialogues and debates helps students develop their ability to assess different points of view and formulate their ideas. Furthermore, students can share knowledge and learn from one another more readily while using social media platforms for collaborative learning because they facilitate it so well. Because the various social media platforms provide strong support for this kind of learning, students can exchange knowledge and learn more readily when using social media for collaborative learning (Al-Adwan, et al., 2020). Kumar, Agarwal, & Agarwal (2021) pointed out that the results show that student involvement and active, collaborative learning have a significant and positive link. Students' learning performance does eventually increase since they may have access to additional resources and data through group learning and involvement. The results of this study's examination of engagement and cooperation lend support to the application of constructivist theory. The findings show that incorporating social elements into group discussions enhances learning outcomes through cooperation and involvement.

Perceived Enhanced Communication

Students are using social media platforms like Facebook, Instagram, and TikTok more frequently for connection and communication. Through social media, researchers have investigated the impact of perceived improved communication on academic achievement. Salikhova, et al., (2023) claim that using social media can be bad for academic success. Additionally, they point out that excessive usage of social media can lead to distractions and make it difficult to focus when studying. Nonetheless, research by Guo, Shen, & Li (2018) suggests that using social media can enhance academic performance. Academic communities are seen to gain from communication since it facilitates prompt communication and member engagement in a collaborative learning environment, according to (Al-Adwan, et al., 2020). If users actively use social media platforms and build virtual relationships, they should be able to obtain diverse sets of information from a variety of sources.

Salikhova, et al. (2023) have discovered that social media can help with peer-to-peer cooperation and communication, making it simple for students to share resources and ideas. As a result, students may become

more motivated, engaged, and willing to share knowledge, ultimately improving their academic achievement. Overall, perceived improved communication through social media use has a wide range and complexity of consequences for academic achievement. Although Aldahdouh, Nokelainen, & Korhonen (2020) claim that excessive social media use may negatively impact students' academic performance, and other research indicates that social media use might benefit academic achievement by encouraging collaboration and communication among students.

Perceived Enjoyment

According to Alalwan, et al. (2019), perceived enjoyment is the satisfaction one feels from utilizing a certain technology that improves learning outcomes. Al-Rahmi, et al. (2022) claim that people use social media because they think it will make them happy. Sarwar, Zulfiqar, Aziz, & Ejaz Chandia (2019) define perceived enjoyment as the level of enjoyment one expects from using technology, regardless of any potential performance issues. Some users think that by using social media, they may perform and produce better work. They demonstrate their satisfaction and enjoyment by focusing on the process of using the device to complete tasks.

Users' enjoyment of social media directly impacts their academic achievement. When students find social media use in the classroom enjoyable, their behavioral intention to use it completely is shown to increase (Alalwan, et al., 2019). Social media use has a significant impact on student's performance since it promotes online interaction and encourages collaborative learning. Perceived enjoyment exhibits a major impact with social media because it is so user-friendly for creating communities and sharing resources (Sarwar, Zulfiqar, Aziz, & Ejaz Chandia, 2019). Social media makes it easy for students to share knowledge, trade information, and have discussions, so they are willing to use it for learning.

Perceived Ease of Use and Perceived Usefulness

Perceived usefulness is a belief that a specific system can improve work performance, according to (Al-Rahmi, et al., 2022). The same definition is supported by Tahar, Riyadh, Sofyani, & Purnomo (2020) who also adds that the intention of the user to use electronic devices was influenced by their perceived usefulness. The concept of perceived ease of use refers to the user's perception that a system can operate without any input from them (Al-Rahmi, et al., 2022). Stated differently, a system's interest level increases with its ease of use.

There is a significant correlation between academic performance, perceived usefulness, and ease of use. The study by (Alalwan, et al., 2019) found that the number of activities that university students and researchers participate in has increased because of perceived usefulness and perceived ease of use. The study was conducted through active collaboration and communication for learning. Hence, it improves the student's learning performance. Furthermore, the ease and usefulness of social media for learning and teaching reflect teachers' and students' intentions. A study by (Ajibade & Zaidi, 2023) found that a greater value for perceived usefulness and perceived ease of use is indicative of a stronger inclination to adopt and use social media.

Recourse Sharing

Resource sharing, according to Arshad & Akram (2018) is the willingness of an individual to disseminate their thoughts and academic content to the public via any means, especially social media. Kaplan & Haenlein (2010) describe social media as a platform that encompasses various forms of media content, enabling users to view all available content from content creators. This assertion aligns with (Ganapathi, 2019) perspective. He said that people can use various social media platforms to share resources and user-generated material. Online games and social media sites such as Facebook, Twitter, and Instagram, according to (Cao, Ajjan, & Hong, 2013), serve as platforms that foster collaborative learning, information gathering, and the growth of online social and professional networks. When it comes to creating and debating content for peer learning and evaluation, students most frequently use Instagram, Pinterest, Snapchat, and WhatsApp as learning tools. These findings suggest that using social media in the classroom can be a creative and engaging way to teach and learn.

According to Khan, Ashraf, Seinen, Khan & Laar (2021) understanding social media use during a pandemic is essential. Their research indicates that social media was important to the pandemic because it allowed students to learn better in challenging circumstances. According to AlAwadhi & Dashti (2021) the Telegram app was a useful tool for information sharing, as well as a reliable source of both textual and non-textual information. This platform has the potential to transcend time and location constraints while saving money, effort, and time.

Telegram's diverse information generates creative ideas that could enhance the efficiency of teaching methods and speed up language acquisition. However, this finding contradicts (Jumabaeva & Ismailova, 2024) findings. According to their findings, social media and user-generated content websites are becoming more and more significant for students, but not for academic reasons. Students use social media for entertainment and communication.

3. Research Methodology

Study Design and Sampling Method

This is a cross-sectional study where the data were gathered once over four weeks. The population in this consists of all students from the Segamat Campus of Universiti Teknologi Mara (UiTM), Johor Branch. This study employs convenience sampling. We employ this method since it is the most accessible. A minimum sample size according to the model's complexity was given by (Hair, Anderson, Babin, & Black, 2010).

Table 1: Model Characteristics using SEM.

Model Characteristics (Number of latent constructs and items)	Minimum Sample Required
No more than five latent constructs. Over three items are present in every construct	100
No more than seven latent constructs. There are more than three items in each construct	150
No more than seven latent constructs. A specific construct (under the identified model) contains fewer than three items	300
A large number of latent constructs. In some constructs (under the identified model), there are less than three items	500

Based on Table 1, we selected an observational minimum of 300 participants for this study. Therefore, a total of 388 respondents took part in the survey.

Research Instrument

For our investigation, we gathered primary data via an online questionnaire. We created a Google Form to gather data from the study's online survey respondents. This method was chosen for the study because it was appropriate and offered several benefits. The advantages include the ability to send the questionnaire to a large number of respondents simultaneously via email, which reduces the necessary expenditure, as well as the convenience of having busy respondents finish the questionnaire whenever it's convenient for them.

To meet the goals, we modified a series of questions from earlier studies. We used an amended version of (Al-Adwan, et al., 2020)'s survey as the questionnaire. There were three sections on the questionnaire. The first part (part A) includes five questions on demographic data, including gender, education level, faculty, course, and current CGPA. The second section, Section B, contains four questions. This section refers to the respondents' prior experience using social media and the Internet. Section C, the final part, is divided into eight sections. The instrument comprises 32 items that assess the degree of agreement among respondents on eight variables: collaborative teaching, perceived enhanced communication, perceived enjoyment, perceived ease of use, perceived usefulness, sharing of resources, usage of social media, and student performance. The interval scale matrix with pre-coded numerical scales in the responses was employed in this part to determine the extent of each respondent's perspective; a 5-point scale was selected. Strongly disagreeing receives one point, and strongly agreeing receives five points.

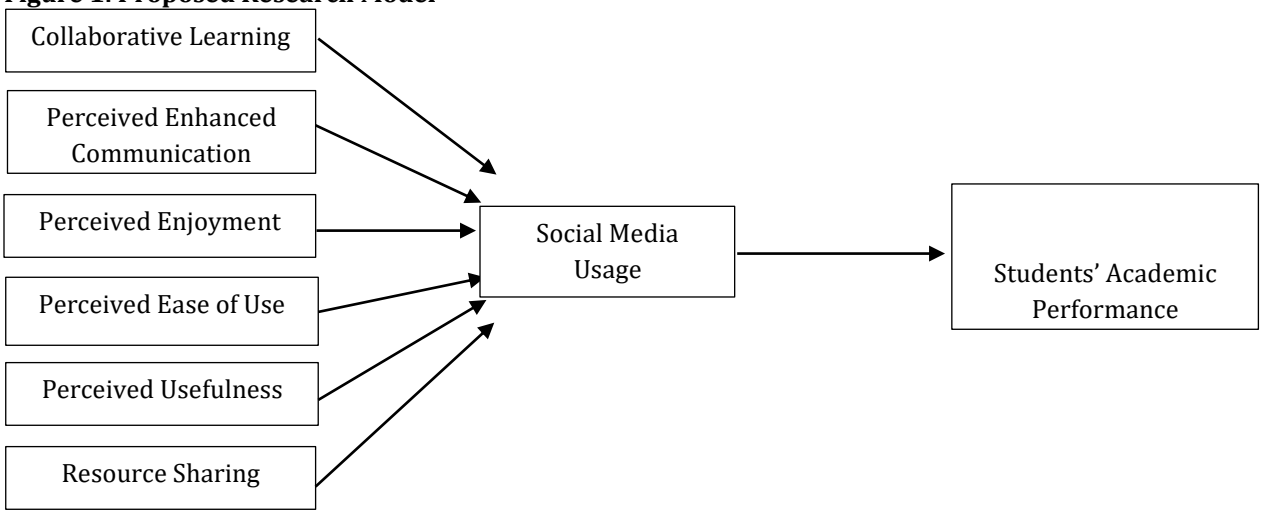
The following are the research objectives in this study:

- To determine whether social media usage mediates the relationship between perceived ease of use and student performance.
- To determine whether social media usage mediates the relationship between perceived usefulness and student performance.
- To determine whether social media usage mediates the relationship between collaborative learning and student performance.

- To determine whether social media usage mediates the relationship between perceived enhanced communication and student performance.
- To determine whether social media usage mediates the relationship between perceived enjoyment and student performance.
- To determine whether social media usage mediates the relationship between resource sharing and student performance.

Figure 1 displays the suggested research model for this study. The dependent variable is student performance (STP), and the six independent variables, which are resources (RES), collaborative learning (COL), perceived ease of use (PEOU), perceived enhanced communication (PEC), perceived enjoyment (PEE), and perceived usefulness (PU), are mediated by social media usage (SMU).

Figure 1: Proposed Research Model



Reliability Test

The study of the components and characteristics of measurement scales is known as reliability analysis. Cronbach's alpha, which is obtained from the average correlation of standardized test items, is used when assessing a test. If the items are not standardized, the average covariance between them is used. Cronbach's alpha is a correlation coefficient with a range of values from 0 to 1. This investigation employs Cronbach's alpha for multipoint-scaled items. A more accurate dependability measurement tool has coefficients that are nearly equal to 1. The lower the coefficients (around 0), the less effective the instrument is (Hair Jr, Page, & Brunsveld, 2016). According to (Conroy, 2015), a pilot test requires a minimum sample size of 30 respondents due to the high degree of correlation between the scale items. Consequently, 39 individuals took part in the pilot test for this study. The analysis determined the Cronbach's alpha reliability coefficients for the following domains: collaborative learning, perceived enhanced communication, perceived enjoyment, perceived ease of use, perceived usefulness, resource sharing, and student academic performance, yielding results of 0.805, 0.828, 0.710, 0.887, and 0.826, respectively. All the instruments' Cronbach's alpha ratings are good, indicating that they are useful and reliable for further study.

Method of Data Analysis

The collected data will be analyzed using SPSS software and AMOS software. Several types of analyses were used in this study, including descriptive analysis, reliability tests, tests of normality, confirmatory factor analysis (CFA), and structural equation modeling (SEM).

Descriptive Statistics

Descriptive statistics transform unprocessed data into a format that provides details on a group of variables under specific circumstances. Descriptive analysis examines the respondents' demographic profile using frequency or percentage tables, cross-tabulations, and charts. We used frequency distribution analysis to examine the demographic profile of the respondents. The following profiles will be examined: students' CGPA, faculty, course, gender, and level of education.

Normality Test

The test of normality is used to investigate whether the dependent variables are normally distributed or not. This is because all parametric tests require the variables analyzed to be normally distributed. If the absolute values of kurtosis and skewness are 2.0 or less, the data is considered normally distributed, as per (Hair, Black, & Babin, Multivariate Data Analysis: A Global Perspective, 2010). Alternatively, non-parametric analysis needs to be employed in the analysis if the variables are not normal.

Structural Equation Modelling (SEM)

Factor analysis and multiple regression analysis are combined in this test. We employ it to explore the structural relationship between latent constructs and observable variables. Evaluating the measurement model and the structural model are the two phases in the SEM process. The relationship between the response items and the underlying latent construct is demonstrated by the measurement model. Before creating the structural model, the researcher needs to evaluate the model for validity, dependability, and one-dimensionality. As per (Awang, Afthanorhan, Lim, & Zainudin, 2023), the study needs to ensure that the measurement model for every latent construct in the model is accurate, reliable, and unidimensional before proceeding with the SEM. Meanwhile, the structural model reveals the relationships between the study's constructs. The theoretical framework's hypotheses guide the assembly of the construct into a structural model. Confirmatory factor analysis (CFA) is used for validation. To be considered valid, the measurement model for the eight latent components needs to satisfy the requirements for concept validity, convergence validity, and discriminant validity. To run the CFA, there are two methods. One approach is to do the CFA process for each latent construct in the research independently. The choice of which strategy to use is left up to the individual researcher, as the second method involves running the CFA procedure for all constructs concurrently. In this study, we explore the mediating effects of social media usage on the correlations between educational variables and academic performance among students, as well as the relative strengths of all factors impacting student performance using SEM.

4. Results

Factor Analysis

Table 1: Exploratory Factor Analysis (EFA) with Factor Loading > 0.6

Constructs	No of Item	KMO	Bartlett's Test
Perceived Ease of Use	4	0.787	0.000
Perceived Usefulness	4	0.712	0.000
Collaborative Learning	4	0.788	0.000
Perceived Enhanced Communication	4	0.602	0.000
Perceived Enjoyment	4	0.757	0.000
Resources Sharing	4	0.749	0.000
Social Media Use	4	0.689	0.000
Student Performance	4	0.606	0.000

Reliability Analysis

The scale analysis used in the research for measuring is assessed using Cronbach's alpha. The internal consistency measure for each construct must be greater than or equal to 0.6. As suggested by (Sekaran & Bougie, Research methods for business: A skill building approach, 2016) and (Awang, Afthanorhan, Lim, & Zainudin, 2023) instruments having Cronbach's alpha values higher than 0.6 are considered reliable for use. All the instruments for perceived ease of use, perceived usefulness, collaborative learning, perceived enhanced communication, perceived enjoyment, resource sharing, social media use, and student performance are verified by the reliability analysis in Table 2, which shows that the results are highly reliable, with all the instruments scoring more than 0.7.

Table 2: Assessment of Reliability for All Construct

Constructs	No of Item	Cronbach's Alpha
Perceived Ease of Use	4	0.887
Perceived Usefulness	4	0.826

Collaborative Learning	4	0.805
Perceived Enhanced Communication	4	0.828
Perceived Enjoyment	4	0.811
Resources Sharing	4	0.900
Social Media Use	4	0.758
Student Performance	4	0.803

Normality Assessment

The normality of data is accessed and shown in Table 3.

Table 3: Normality Test

Constructs	No of Item	Cronbach's Alpha
Perceived Ease of Use	4	0.887
Perceived Usefulness	4	0.826
Collaborative Learning	4	0.805
Perceived Enhanced Communication	4	0.828
Perceived Enjoyment	4	0.811
Resources Sharing	4	0.900
Social Media Use	4	0.758
Student Performance	4	0.803

Measurement Model

Confirmatory factor analysis is used to analyze a measurement model that incorporates all the constructs. In this part, all the items of the measurement model with a factor loading greater than 0.6 will remain in the model, while the items that failed to fulfill the requirement will drop from the measurement model, as shown in Figure 1. Table 4 shows that, following the suggestions of (Awang, Afthanorhan, Lim, & Zainudin, 2023), the fitness indices satisfy the requirements for validity for each construct after eliminating one item (COL1) with a factor loading value less than 0.6 (COL1 = 0.53).

Figure 1: Pooled CFA for Measurement Model of All Constructs

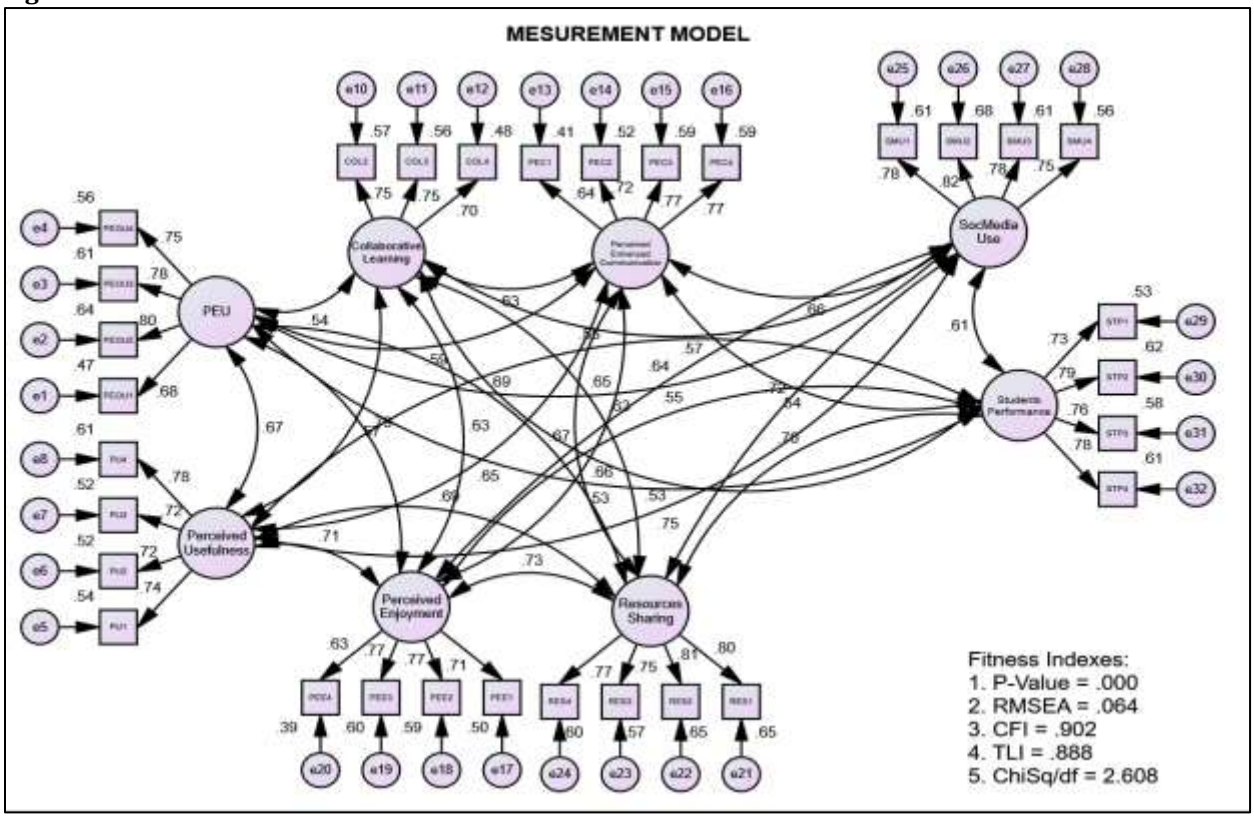


Table 4: Evaluation of Fitness Indexes for the Measurement Model in Figure 1

Name of Category	Index	Index Value	Interpretation
Absolute Fit	RMSEA	0.064	The level of requirements is met
Incremental Fit	CFI	0.902	The level of requirements is met
Parsimonious Fit	Chisq/df	2.608	The level of requirements is met

According to Tables 5 and 6, the measuring model has strong discriminant and convergent validity. The results show that the measurement model satisfies the CFA's validity and reliability requirements:

- Every item's factor loading exceeds 0.6, indicating its significance and relevance to the corresponding structures.
- All constructs have average variance extracted (AVE) values greater than 0.5, meeting the required level.
- The constructs exhibiting a composite reliability (CR) over 0.7 prove the dependability and internal consistency of each construct's elements.

These findings suggest that the measuring model's validity and reliability are higher. The items and constructs have been precisely defined and quantified (Hair, Black, & Babin, 2010).

Table 5: Composite Reliability and Convergent Validity

Construct	Item	Factor Loading	CR	AVE
Perceived Ease of Use	PEOU1	0.700		
	PEOU2	0.803	0.875	0.637
	PEOU3	0.880		
	PEOU4	0.800		
Perceived Usefulness	PU1	0.736		
	PU2	0.718	0.828	0.547
	PU3	0.718		
	PU4	0.783		
Collaborative Learning	COL2	0.754		
	COL3	0.749	0.777	0.538
	COL4	0.696		
Perceived Enhanced Communication	PEC1	0.639		
	PEC2	0.724	0.816	0.527
	PEC3	0.766		
	PEC4	0.766		
Perceived Enjoyment	PEE1	0.710		
	PEE2	0.800	0.820	0.535
	PEE3	0.773		
	PEE4	0.630		
Resources Sharing	RES1	0.804		
	RES2	0.807	0.865	0.615
	RES3	0.753		
	RES4	0.772		
Social Media Use	SMU1	0.784		
	SMU2	0.823	0.864	0.615
	SMU3	0.778		
	SMU4	0.749		
Students Performance	STP1	0.726		
	STP2	0.787	0.849	0.584
	STP3	0.764		
	STP4	0.779		

Table 6: Discriminant Validity Index

Construct	PEOU	PU	COL	PEC	PEE	RES	SMU	STP
Perceived Ease of Use	**0.798**							
Perceived Usefulness	0.670	**0.740**						
Collaborative Learning	0.540	0.570	**0.733**					
Perceived Enhanced Communication	0.590	0.650	0.630	**0.730**				
Perceived Enjoyment	0.790	0.710	0.630	0.660	**0.731**			
Resources Sharing	0.690	0.690	0.650	0.670	0.730	**0.784**		
Social Media Use	0.630	0.640	0.570	0.660	0.640	0.720	**0.784**	
Students Performance	0.530	0.550	0.530	0.54	0.550	0.700	0.610	**0.764**

Structural Model

Once the measurement model's validity and reliability have been established, the study's research hypothesis is tested using a structural model. Figure 2 displays the path coefficient that links each exogenous construct to the endogenous construct. In this study, the relationship between exogenous and endogenous constructs is mediated by just three hypotheses, whereas the remaining three hypotheses are not supported by the findings of the hypothesis testing, as summarized in Table 7.

Figure 2: Structural Model of Students' Performance

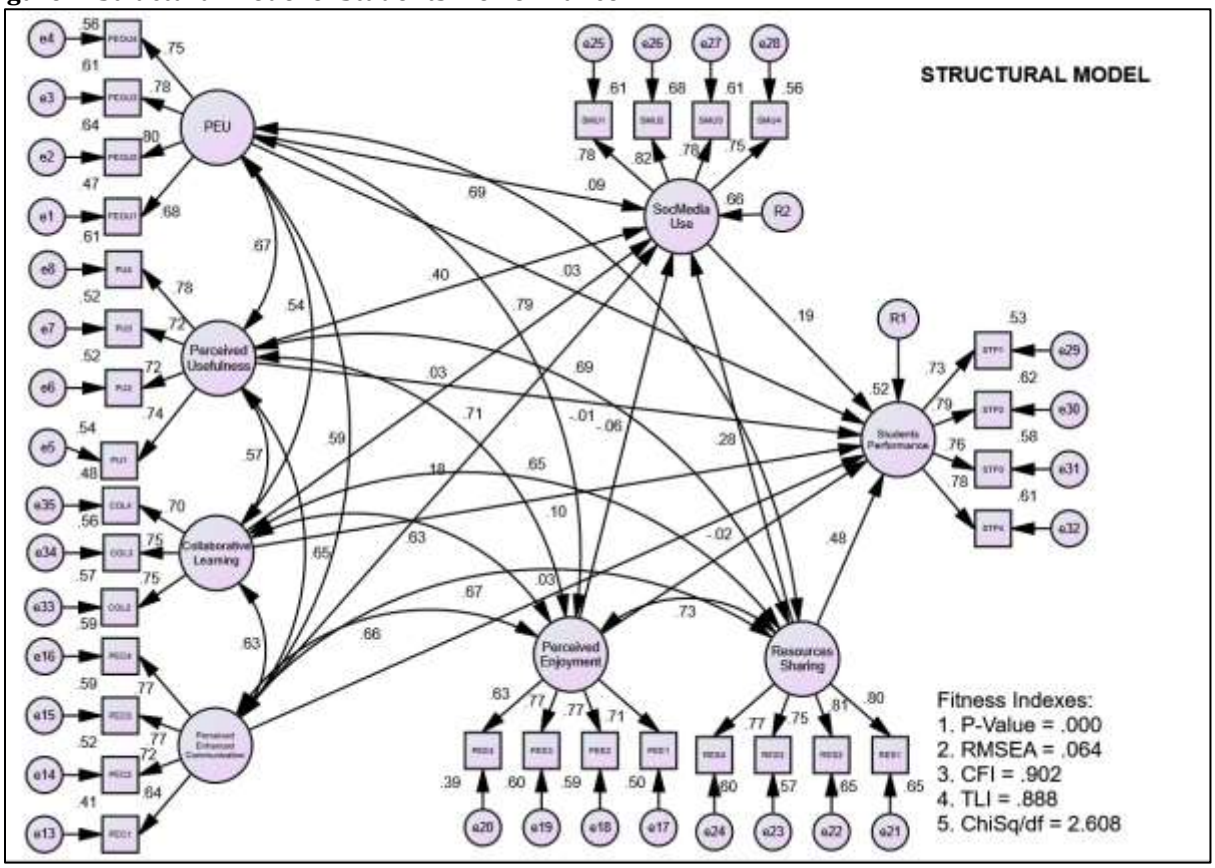


Table 7: Structural Path Coefficients for Students' Performance

Variable	Path	Variable	B	P-value	Result
Perceived Ease of Use	➔	Students Performance	0.034	0.745	**Not Significant**
Perceived Ease of Use	➔	Social Media Use	0.117	0.308	**Not Significant**
Social Media Use	➔	Students Performance	0.154	0.045	**Significant**
Conclusion:	1. Indirect effects (PEU to SMU) are not significant while indirect effects (SMU to SP) are significant. 2. The direct effect (PEU to SP) is not significant. 3. Thus, there is no mediation effect in this relationship.				
Perceived Usefulness	➔	Students Performance	-0.007	0.939	**Not Significant**
Perceived Usefulness	➔	Social Media Use	0.456	0.000	**Significant**
Social Media Use	➔	Students Performance	0.154	0.045	**Significant**
Conclusion:	1. Both indirect effects (PU to SMU and SMU to SP) are significant. 2. The direct effect (PU to SP) is not significant. 3. Thus, the type of mediation is full mediation.				
Collaborative Learning	➔	Students Performance	0.080	0.218	**Not Significant**
Collaborative Learning	➔	Social Media Use	0.034	0.629	**Not Significant**
Social Media Use	➔	Students Performance	0.154	0.045	**Significant**
Conclusion:	1. Indirect effects (CL to SMU) are not significant while indirect effect (SMU to SP) is significant. 2. The direct effect (CL to SP) is not significant. 3. Thus, there is no mediation effect in this relationship.				
Perceived Enhance Communication	➔	Students Performance	0.032	0.712	**Not Significant**
Perceived Enhance Communication	➔	Social Media Use	0.231	0.013	**Significant**
Social Media Use	➔	Students Performance	0.154	0.045	**Significant**
Conclusion:	1. Both indirect effects (PEC to SMU and SMU to SP) are significant. 2. The direct effect (PEC to SP) is not significant. 3. Thus, the type of mediation is full mediation.				
Perceived Enjoyment	➔	Students Performance	-0.021	0.846	**Not Significant**
Perceived Enjoyment	➔	Social Media Use	-0.068	0.553	**Not Significant**
Social Media Use	➔	Students Performance	0.154	0.045	**Significant**
Conclusion:	1. Indirect effects (PE to SMU) are not significant while indirect effect (SMU to SP) is significant. 2. The direct effect (PE to SP) is not significant. 3. Thus, there is no mediation effect in this relationship.				
Resources Sharing	➔	Students Performance	0.408	0.000	**Significant**
Resources Sharing	➔	Social Media Use	0.298	0.000	**Significant**
Social Media Use	➔	Students Performance	0.154	0.045	**Significant**
Conclusion:	1. Both indirect effects (RS to SMU and SMU to SP) are significant. 2. The direct effect (RS to SP) is significant. 3. Thus, the type of mediation is partial mediation.				

The findings of this research showed that social media use significantly mediates the relationship between perceived usefulness and students' performance and perceived enhanced communication with students' performance. While social media uses only significantly partially mediate the relationship between resource sharing and students' performance. Meanwhile, another three variables which are perceived ease of use, collaborative learning, and perceived enjoyment, are not mediated by social media use for students' performance.

Therefore, the results of the findings show that social media use mediates the relationship between only three variables, which are perceived usefulness, perceived enhanced communication, and resource sharing, on students' performance.

Discussion

In this study, social media usage mediates the relationship between perceived usefulness and students' performance. The ease of usage of social media in the classroom primarily justifies its encouragement, as it positively impacts students' performance. Moreover, a technical system's perceived ease of use is related to how conveniently it can display and provide information. In other words, e-learning systems are more convenient and practical for students to use when they feel more at ease with them. These findings are consistent with those of (Arshad & Akram, 2018) and (Rahman, Ramakrishnan, & Ngamassi, 2020). When students think social media is easy to use and useful for their education, they are more inclined to include it in their studies. (Almaiah, Al-Lozi, Al-Khasawneh, Shishakly, & Nachouki, 2021) found that students view online learning platforms as useful when they find that they enhance their performance and achievement by increasing their overall learning productivity. Learning materials need to be created more creatively in the current era of technological development and advancement so that students can easily access, use, and understand them (Sukendro, et al., 2020). Furthermore, (Tahar, Riyadh, Sofyani, & Purnomo, 2020) claimed that when people believe that using technology would improve the quality of their work, this is known as perceived usefulness. Thus, people are more eager to use an e-learning platform that they find more valuable. University students enhance their learning performance and usefulness once they have access to virtual learning portals that support their overall learning productivity. To improve student satisfaction, online learning platforms must be easy to use and typically involve attempts to engage students in an intuitive way (Nuryakin, Rakotoarizaka, & Musa, 2023).

The results of this study also showed that there is a relationship between students' performance and perceived improved communication that is mediated by social media use. According to the students who participated in this survey, social media communication is significant and can increase output as well as academic success. Perceptions of enhanced communication, including sharing, cooperation, and involvement, significantly influence students' intentions to use social media in higher education. It has been found that social media use enhances people's abilities for creativity, communication, online learning, and resource access, all of which influence students' academic achievement. Students are more involved and engaged with their instructors and peers because they have access to a wider range of learning resources and communication channels. (Sarwar, Zulfiqar, Aziz, & Ejaz Chandia, 2019) agree with this. Sharing educational materials on social media platforms increases students' online access because they are readily available and cost-free. This increases students' engagement and connection with educators and other students by giving them access to a greater variety of learning tools and communication channels. According to (Conradie, Lombard, & Moller, 2013), students regularly use their mobile devices for communication, engagement, sending new content, and receiving notifications when teachers or other students interact with the course materials. Furthermore, (Malik, Ahmad, Kamran, Aliza, & Elahi, 2020) agreed that students can share their work and accomplishments on social media platforms, inspiring others to be creative and perform well academically. They also claim that social media provides a wide range of benefits that can improve students' creativity, general academic performance, and motivation to learn.

Besides that, this study shows that social media usage mediates the relationship between resource sharing and student performance. Resource sharing can be categorized into two constructs, which are material sharing and knowledge sharing. Nowadays, social media platforms are being extensively used to create networks of people who share knowledge, bringing people together who have similar interests, and encouraging idea sharing. These results were consistent with (Haque, et al., 2023) and (Ali-Hassan, H., & Wade, 2015). The findings supported the theory that academic achievement for students is favorably correlated with the social value of knowledge sharing in social media-related factors. The usefulness of information obtained over the internet is what defines its worth, particularly if it aids in the user's skill and ability development by solving difficulties (Zhang, Li, Wu, & Li, 2017). Another study by (Maqableh, Jaradat, & Azzam, 2021) showed that knowledge has a beneficial and significant effect on students' academic performance. Social media will develop into a useful teaching and learning resource in higher education. Through document sharing, student participation, and knowledge expansion, this medium fosters knowledge exchange. (Eid & Al-Jabri, 2016) asserted a positive

correlation between information sharing, file sharing, and offline and online interactions. Their study indicates that students frequently share educational content, such as lecture notes, homework assignments, project papers, and instructional videos, on social media platforms. Dropbox, WhatsApp, and YouTube are commonly used for document sharing. The students often use electronic devices for learning and resource sharing (Muca, et al., 2022). As reported by (Sivakumar, Jayasingh, & Shaik, 2023), social media can improve student motivation and performance by encouraging knowledge sharing, encouraging student involvement, and acting as a useful tool for information transmission.

Meanwhile, no mediation effect of social media usage exists between perceived ease of use and student performance. (Liu, Zaigham, Rashid, & Bilal, 2022) agreed. Their research indicates that perceived ease of use does not significantly impact the effectiveness of social media collaborative learning. The fact that students use social media mostly for information and communication could be one reason for this rejection. Aside from that, perceived enjoyment is not mediated by social media use for students' performance. Students might experience many of the same negative impacts that professionals face at work when using social media in the classroom. Cengage Learning (2014) found that 59% of students employ social media in the classroom. (Brooks, 2015) found a negative correlation between students' performance and social media entertainment, potentially causing people to suffer if they react to these disruptions or diversions. Additionally, this study showed that there is no mediating influence between social media use and student performance or collaborative learning. This rejection is because the students in this study were less experienced in collaborative learning. Many students actively dislike dealing with the issues that arise from working in groups and instead prefer to work alone.

5. Managerial Implications and Recommendations

The use of social media has become an essential part of modern life. It is one of the best marketing tools, in addition to being a communication tool. Nowadays, teachers are finding new ways to communicate with parents, students, and other parties on social media. Using social media to establish ties with students all over the world is a fantastic idea. It offers the opportunity to teach information and experience to students in a way that best suits their needs. Additionally, because of social media, students may gain experience with remote collaboration. In today's increasingly digital world, students need to be able to work independently and swiftly adjust to new situations. While there are numerous considerations to make before integrating social media into the classroom, we are certain that doing so will support students' development of increasingly complex technology skills. This study's focus on students at a single public institution in Segamat, Johor, restricts its broad applicability to other contexts. Therefore, additional demographic groupings, such as employees or students from different universities, can be the subject of future research. This study solely concentrated on the factors that act as mediators between two variables. Thus, future research can investigate the factors in social media usage that influence students' academic performance.

Conclusion

We conducted this study to examine the mediating effects of social media usage on the relationships between educational variables and academic performance among students enrolled in public higher education institutions. The researchers conclude that social media usage mediates the relationship between perceived usefulness, perceived enhanced communication, resource sharing, and student performance at UiTM Segamat. Meanwhile, social media use does not act as a mediating factor between students' performance and perceived ease of use, collaborative learning, or enjoyment. To use social media as a teaching tool, especially in higher education institutions, the study's findings contribute new knowledge to the field. The higher education community may share knowledge anytime and anywhere. After learning sessions, educators and students can engage with one another using this platform, which will help the student improve their academic performance more successfully. For students who need to improve their grades and academic performance, this study can help teachers advise their students on how to use the Internet properly for academic objectives. Besides that, this study will be helpful to the government since it wants to make sure that every youthful generation can adopt new technology as it spreads swiftly throughout the world. If people can adapt to technology, it will help improve the nation's economy.

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