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# Article # 01: AN INVESTIGATION OF THE IMPACT OF COVID-19 ON THE FUTURE OF WORK IN MALAYSIA: ACCELERATING TRANSFORMATION THROUGH DIGITAL COMPETENCY

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***Abstract*—** The COVID-19 pandemic has caused major societal changes that have a dramatic impact on many facets of society, including the future of work. This research aims to examine the influences of the successful hybrid working model. The factors that will be discussed in this study included the internal factors such as digital talent, digital competency, worker competitiveness and the external factors, revolution of industry 4.0 in workforce. In this study, the primary data will be collected through questionnaire by using the online survey platform – Google Forms. The sampling method and technique for this study is convenient sampling of non-probability sampling method. Total 130 responds have been collected, in which the survey is circulated within Malaysia. The result of the study revealed that digital talent, digital competency, and worker competitiveness have significant on the success of hybrid working model. On the other hand, the external variable, revolution of industry 4.0 in workforce on the success of hybrid working model is insignificant.

**Keywords—Digital Competency, Covid-19, Hybrid Working, Industry 4.0**

**Introduction**

The Covid-19 pandemic accelerated the transformation of the future of work for most organizations in the world. When Covid-19 happened in 2020, it forced workers to adapt to the working-from-home culture rapidly, and it caused them to become more siloed in how they communicate, engage in lesser real-time conversation and spend more time in virtual meetings (Antonopoulou et al., 2021). With that, workers are expected to become tech-savvy as digital skill plays an important role that will shape the future of work in 2022 and beyond. It enables the organization to become an innovative, inclusive and insightful workplace and craft a strategy to re-assess how daily tasks get done more efficiently. Simply because digital and technological trends will drive the future of work.

In the 21st century, there is a notable transformation taking place in the work environment. The use of technology, changes in societal values, and a worldwide pandemic have contributed to the shift in how we work and the skills that are required. The Future of Work is of great importance as it will greatly impact the economy. According to the World Economic Forum, the global workforce is expected to undergo significant changes by 2025, with over 50% of employees needing to acquire new skills to stay employable. This shift will not only affect individuals and organizations but will also have far-reaching implications for the economy at large. It is essential to comprehend the changing dynamics of the labour market to ensure economic stability and growth.

In addition, the Future of Work holds significance for individuals too. As technology progresses, it will present fresh job prospects, but will also demand different abilities and knowledge. Workers who have the ability to adapt and possess a wide-ranging skill set will be better equipped to thrive in the evolving job market. Thus, it's essential for individuals to be mindful of the skills that will be in high demand and to consistently develop their expertise to remain competitive.

The Future of Work holds significance because it will affect our way of life and how we engage with each other. The pandemic has resulted in a rise in remote work, and many people anticipate that it will continue to be a prominent aspect of the Future of Work. This transition could result in more versatility for workers, but also poses novel difficulties in terms of preserving team relationships and communication. To navigate these changes, it's crucial to comprehend how the Future of Work will impact our social and personal lives.

Despite the aforementioned reasons, the Future of Work also holds importance for organizations themselves. The capacity to appeal to and retain talented employees will pose a significant challenge for companies in the future. Businesses that can establish a constructive work culture, provide avenues for skill enhancement, and offer adaptable work arrangements will be more successful in recruiting top-tier talent.

The purpose of this study is to investigate the significance of digital competency as vital components of the Future of Work. The research aims to identify why these skills are crucial and how workers can equip themselves with such proficiencies to maintain competitiveness in the future job market.

**literature review**

Nadzim & Halim (2022) conducted research that indicates a positive correlation between digital competency and employee agility. This finding is supported by several other researchers who have explored the relationship between digital competency and worker performance. Varshney & Varshney (2020) discovered that workforce agility has a significant impact on employee performance, while Lim et al. (2021) proposed that developing digital competency is a crucial step towards achieving employee agility.

In their research paper, Jaafar & Fahmy (2022) highlight the importance of digital talent for organizations undergoing digital transformation. They note that defining digital talent can be challenging, as different organizations and industries have different interpretations of what constitutes digital talent. Generally, digital talent is understood to refer to employees who possess knowledge, skills, and abilities related to information technology. Despite the lack of a consensus definition, having digital talent is considered a crucial advantage for organizations. The research paper aims to develop a framework for identifying digital skills specifically for the petrochemical industry in Malaysia.

According to the research conducted by Khan et al. (2021), the world is now transitioning into a digital economic era, and Malaysia needs to be prepared to become an information-rich society. In order for Malaysia's digital economy to succeed, businesses must adapt to the rapid technological changes that impact the way they work. To remain competitive, companies need to consider improvements in their workforce skills. Former Malaysia Minister of Youth and Sports, Khairy Jamaluddin, highlighted that the rapidly developing digital economy is increasing the demand for highly skilled technical workers and digital business skills. Industry 4.0 is not only about investing in new technologies and resources to boost efficiency, but it also has a broad influence on different aspects of human activities and affects every aspect of their lives. With the advancement of technologies, it is apparent that the potential workforce needs to be technologically capable to remain competitive not only within their organization but also in the market and industry.

Access to skilled labour is a critical factor that distinguishes successful organizations from unsuccessful ones. In the era of Industry 4.0, a skills gap is occurring across all industries, and jobs are changing faster than ever before due to rapid developments in robotics, artificial intelligence (AI), metaverse, and other new technologies that require a higher level of digital competency. According to a World Economic Forum report by Gray (2016), there are ten skills required for the Industry 4.0 era, including complex problem solving, critical thinking, creativity, people management, coordination, emotional intelligence, judgement and decision-making, service orientation, negotiation, and cognitive flexibility. These digital competency elements drive the workforce to be more adaptable to fast-moving technology.

From a communication practitioner point of view, this research aims to determine the necessary level of digital competency in organizations to effectively implement and utilize technology in daily operations, particularly in a hybrid work environment that has become prevalent post-pandemic. A recent study by Cisco (2023) found that 74% of Malaysians prefer a hybrid work model. Indonesia had the highest preference at 84%, followed by Vietnam at 76%, Singapore at 71%, Thailand at 68%, and the Philippines at 60% across ASEAN markets. In Malaysia, 60% of respondents reported increased productivity, and 83% stated that they have been able to learn, grow and succeed in their roles over the past two years. The survey also revealed that technology is a top priority for working from home, with 55% saying that increased use of technology was critical, and 50% indicating a greater use of virtual meeting and collaboration tools. These findings suggest that the adoption of a hybrid work model is evolving and accelerating faster than expected post-pandemic, highlighting the crucial role of digital competency in the future of work.

Aardenburg (2021) notes that several factors are critical to the success of a hybrid work model, including culture, people, technology, and processes. With respect to the research topic, the right technology tools are essential for any remote-first infrastructure. Technology should be seen as an enabler that helps organizations transition to a hybrid work model. Digital transformation has become a necessity for businesses of all sizes and industries to survive, and having adequate digital infrastructure is crucial for future work (Gadhi, 2020). However, some organizations have faced challenges when transitioning to remote work, such as a lack of digitized paperwork, concerns regarding information confidentiality, and the fact that technology-related problems take longer to resolve remotely. Such problems could negatively impact workers' productivity.

**research methodology**

In this study, a deductive approach is employed. An instrument has been meticulously crafted to explore the relationships among the variables involved in the study. The study focuses on the dependent variable, which pertains to the success of the hybrid work model, and the independent variables, including digital talent, digital competency, and worker competitiveness.

In this study, the researcher will conduct an online questionnaire through Google Forms to collect data from the target respondents. In this research, an electronic survey is employed as the preferred method for data collection due to its recognized convenience and efficiency. A total of 123 participants will receive the online questionnaire via communication platforms such as WhatsApp and LinkedIn.

The questionnaire comprises two distinct sections. Section A is dedicated to gathering demographic information from the respondents, while Section B is designed to assess all four variables. Responses to all items are solicited using a five-point Likert scale, spanning from one to five (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree).

*Independent and Dependent Variables*

From the literature review, there are four variables which affecting the company productivity as tabulated in Table I.

Summary of Variables for Digital Competency

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*Data Analysis Method*

In this study, SMART PLS 4 software will be used to analyse the data collected from the questionnaires. To analyse the model's outcomes, Partial Least Squares Structural Equations Modelling (PLS-SEM) will serve as the chosen analytical technique. SMART PLS 4 software is employed due to its robust capabilities, particularly in constructing reliability and validity assessments with small sample sizes. Additionally, SMART PLS 4 can effectively address abnormal data through the central limit theorem, ultimately enhancing R-squared values and minimizing errors.

**results**

By using SMART PLS 4 Software to compute the data, the data were analysed.

*Structural Model Path Coefficients*

The study conducted a PLS-SEM analysis, concentrating on the investigation of path coefficients as a crucial technique for scrutinizing the structural model, after determining the validity and reliability of the model. In this study, standard deviations, T-statistics, and P-values were evaluated using the bootstrapping technique.

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Structural Model (Bootstrapping)

Fig. 1 presented the structural model of this study. This model is computed based on bootstrapping method, where it has bootstrapped to 130 samples.

Summary of Structural Model Path Coefficient

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Table II projected the summary of a statistical analysis that examines the relationship between several variables (Digital talent, Impact of digital competency in future of work model, Worker Competitiveness, and Revolution of Industry 4.0 in workplace) and an outcome variable referred to as Success of hybrid work model. A significant level was set at 0.05 (5%). This results that when P-value is exceed the significant lever of 0.05, the result is unsupported.

From Table II, the Revolution of Industry 4.0 in workplace (RB) does not have significant relationship with the success of hybrid work model (O). Other independent variables, Digital talent (H), Worker Competitiveness (M), and Impact of digital competency in future of work model (L) have significant relationship with the independent variable – Success of hybrid work model (O).

*Coefficient of Determination (R2)*

R2 value, also known as the coefficient of determination, is the most frequently used metric to assess the structural model's capacity for prediction. The R2 number varies from zero to one, with a larger value indicating more prediction accuracy.

R-Square results

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From Table III, the R Square value of 0.836 in this table suggests that approximately 83.6% of the variability in the "Success of hybrid work model" (variable O) is explained by the independent variables or factors included in this study. This is a relatively high R Square value, indicating that this model is successful in capturing and explaining a large portion of the variance in the outcome.

In addition, the R Square Adjusted value of 0.831 in the table represents the adjusted version of R Square. It still reflects the proportion of variance in the "Success of hybrid work model" (variable O) explained by the independent variables, but it considers the complexity of the model. This adjusted value, which is slightly lower than the unadjusted R Square, indicates that the model maintains a high degree of explanatory power even after considering the number of predictors.

In conclusion, Table III provides valuable information about the goodness of fit of this model in predicting the "Success of hybrid work model" (O). The high R Square value (0.836) suggests that the model is effective in explaining a significant portion of the variability in the outcome. The slightly lower R Square Adjusted value (0.831) takes into account model complexity and remains indicative of a strong model fit.

*Hypotheses Testing*

*H1: Digital talent has significant influence to drive the success of hybrid work model:* As evident in Fig. 2, the H1 is supported by this study, where it showed digital talent is a significant variable that contribute to success of hybrid work model, because the value is at 0.000.

A diagram of a diagram of influence

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H1: Digital talent has significant influence to drive the success of hybrid work model

*H2: There is a significant relationship between digital competency and hybrid work model:* As shown in Fig. 3, the result has supported H2, in which the value showed 0.00 indicates that digital competency is one of the significant influences that will affect success of hybrid work model in an organization.

A diagram of a number of influence

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H2: There is a significant relationship between digital competency and hybrid work model

*H3: There is a significant relationship of worker competitiveness impact on the hybrid work model:* According to Fig. 4, the result showed that the worker competitiveness can significantly impact the success of the hybrid work model. Employees who possess strong skills, motivation, and adaptability are better positioned to excel in both physical and remote work environments.

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H3: There is a significant relationship of worker competitiveness impact on the hybrid work model

*H4: There is a significant influence from the factor of revolution of Industry 4.0 in workplace impact on the hybrid work model:* According to Fig. 5, the result of this study does not support H4, as the value of 0.999 is greater than 0.5, indicates that there is no significant relationship between revolution of industry 4.0 in workplace contribute to the success of hybrid work model. Research studies suggest that the influence of Industry 4.0 technologies on the success of the hybrid work model can be nuanced and context dependent.

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H4: There is a significant influence from the factor of revolution of Industry 4.0 in workplace impact on the hybrid work model

**Conclusion**

In conclusion, the study on the success of the hybrid work model in the post-COVID-19 era has unveiled a multifaceted landscape shaped by various factors. The findings underscore the pivotal role of digital talent, digital competency, and worker competitiveness in determining the effectiveness of hybrid work arrangements.

The study's results affirm that employees with advanced digital skills and adaptability are more likely to thrive in hybrid work settings. For instance, consider a marketing team where individuals proficient in data analytics can seamlessly collaborate with colleagues both remotely and in the office. This demonstrates how digital talent enhances the team's capacity to deliver results in a hybrid work environment.

The research also highlights the significance of digital competency in navigating the complexities of remote and hybrid work. As an example, think of a software development team that excels in using collaborative coding platforms, ensuring that projects progress smoothly, regardless of whether team members work from home or on-site. This illustrates how digital competency bolsters teamwork and productivity.

Worker competitiveness emerged as another critical factor influencing hybrid work success. Employees who exhibit competitiveness, driven by skills, motivation, and adaptability, contribute significantly to an organization's ability to thrive in a hybrid work model. Consider a sales team where competitive sales professionals consistently meet targets by leveraging their drive and adaptability in remote and office-based interactions. This exemplifies how worker competitiveness positively impacts results in hybrid work scenarios.

The study also acknowledges that contextual factors can shape the success of hybrid work models. For instance, the impact of Industry 4.0 technologies on hybrid work may vary across industries. In manufacturing, automation driven by Industry 4.0 can significantly enhance remote work, whereas in the service sector, the impact may be moderated by the need for close collaboration. This illustrates how the industry context influences the relationship between technology adoption and hybrid work success.

A key takeaway from this study is the importance of research-based decision-making. Organizations can use evidence from studies like this one to inform their strategies. For instance, a forward-thinking company, after reviewing research findings, may decide to invest in digital skills training for employees to better equip them for hybrid work.

While the study provides valuable insights, it's essential to recognize its limitations and the evolving nature of hybrid work models. Future research should continue to explore these dynamics to help organizations adapt effectively to the changing landscape of work arrangements in the post-pandemic era. In doing so, organizations can enhance their resilience, productivity, and competitiveness in an ever-evolving work environment.

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# Article #02: ANALYSIS FACTORS INFLUENCING MALAYSIANS ACCEPTANCE OF BUYING ELECTRIC VEHICLE IN THE NEXT 5 YEARS

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***Abstract***— This study deep dive into the factors influencing Malaysian consumers' acceptance of electric vehicles (EV) over the next five years. Amidst global shifts towards sustainable transportation, this research examines variables such as environmental awareness, technological advancement, cost and price consideration, trust on brand and quality, economic incentives, and infrastructural development. Through a deductive approach, the study incorporates quantitative data from mass market surveys. The findings aim to provide a multifaceted understanding of consumer attitudes and identify barriers to EV adoption. This research is expected to contribute to policy formulation and strategic planning for automotive industry stakeholders, facilitating a transition to greener mobility in Malaysia. In this study, the primary data will be collected through questionnaire using the online survey portal via Google Form. The sampling method and technique for this study is convenience sampling of non-probability sampling method. Total 101 responds have been collected, in which the survey is conducted within Malaysia. The findings and result of the study revealed that Electric Vehicles infrastructure and Social Influence have significant influence on the Electric Vehicles actual adoption. In additional, this paper outlines the current landscape of electric vehicle (EV) adoption globally and in Malaysia, highlighting the critical for sustainable transportation solutions. Despite growing interest, the adoption rate of EVs in Malaysia remains low. The purpose of this study aims to fill the gap in understanding the specific consumer attitudes and barriers that influence EV acceptance in Malaysia. By identifying these factors, the research seeks to inform effective policy and strategic interventions necessary to support the transition to greener mobility and to boost the adoption of electric vehicles (EV) in Malaysia over the next five years.

**Keywords—Electric Vehicles, Consumer Attitudes, Strategic Interventions**

**Introduction**

An electric vehicle (EV) is a vehicle that uses one or more electric motors for propulsion. It can be powered by a collector system, with electricity from extravehicular sources, or it can be powered autonomously by a battery (sometimes charged by solar panels, or by converting fuel to electricity using fuel cells or a generator) (Situ, 2009). EVs include, but are not limited to, road and rail vehicles, surface and underwater vessels, electric aircraft, and electric spacecraft (Bhalshankar & Sutkar, 2021). For road vehicles, together with other emerging automotive technologies such as autonomous driving, connected vehicles, and shared mobility, EVs form a future mobility vision called Connected, Autonomous, Shared, and Electric (CASE) Mobility.

A Malaysian government initiative aids the growth of Electric Vehicle (EV) industry (ITA, 2023). The Electric Vehicle (EV) market in Malaysia is relatively small but growing rapidly. According to the Malaysian Automotive Association (MAA), 2,717 EVs were sold in 2021, a significant increase from the 1,642 units sold in 2020. The EV market share in Malaysia is still relatively low, accounting for only 0.4% of total vehicle sales. However, with the Government’s goal to have 125,000 EVs on the road by 2030, the market is expected to grow in the coming years.

To promote the growth of the EV sector in the country, Malaysia’s Ministry of Investment, Trade, and Industry (MITI) introduced the Battery Electric Vehicle Global Leaders Initiative (BEV GLI) (Yean, 2023). The BEV program allows foreign companies to sell cars in Malaysia without Approved Permit (AP) rules, thus making imported vehicles cheaper. This initiative aims to help boost EV demand in the local market and further promote the development of the ecosystem to support BEV adoption.

Under the Low Carbon Mobility Blueprint, the Government plans to install 10,000 charging stations by 2025. Companies contributing to building EV infrastructure in Malaysia will benefit from government incentives, such as tax breaks (Yean & Rebecca, 2024). This opens up opportunities for U.S. companies that can add value to the EV ecosystem in Malaysia to be part of the national’s EV roadmap. Government and Tax rebate for EV related in year 2022 and extended to year 2023 (Nicholas King, 2023). Government encouragement for EV adoption by giving personal tax exempt for those purchased EV vehicle car related. This action directly contributes in promoting the adoption of electric vehicles. Now, this tax exemption extended to year 2023.

The potential environmental benefits of a transition to EVs in Malaysia, including reduced carbon emissions and air pollution (Kwan et al., 2023). This research can help relevant stakeholder or natural lover understand the potential for EV adoption in addressing environmental challenges. Below is the low carbon mobility campaign (Penjana Kapital, 2023) from Government. In Malaysia, electric vehicles starting become popular as more people are aware of the environmental benefits and technological advancements that EVs can offer. However, EVs are still a relatively new to Malaysian. Thus, in this business research, we are going to analysis of Malaysians acceptance of buying electric vehicle from the traditional automotive for the next 5 years in Malaysia.

**literature review**

Malaysian Green Technology and Climate Change Corporation (MGTC) has undertaken an active role in driving this transition through its Low Carbon Mobility Division. In 2015, MGTC introduced chargEV which is the brand of its public EV charging station network (MGTC, 2022). Besides providing convenient and accessible charging points for users of electric vehicles, it serves as an instrument for the public to experience the EV lifestyle in the Malaysian landscape.

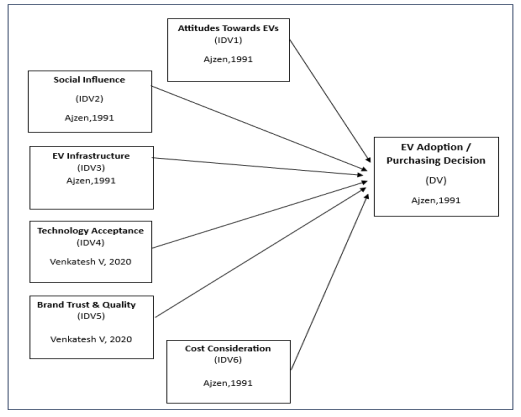
In addition, income tax exemption (Gerard Lye, 2021) for individuals up to RM 2,500 on the cost of installation, rent, hire or purchase for electric vehicle charging facilities will serve as a catalyst for the growth of the industry. Increasing awareness on environmental impacts and consumer’s consciousness towards limiting carbon footprint will also contribute in increasing the business potential of EV players (Ramanath, 2024).

**research methodology**

The primary aim of this research is to analyse the factors influencing Malaysians' willingness and acceptance to purchase electric vehicles from traditional automotive manufacturers within the next five years. The study seeks to generate actionable insights that can guide policy and business strategy in the burgeoning electric vehicle market in Malaysia. Primary data will be collected instead of secondary data for this business research in order to address the research problems, fill the knowledge gaps and provide new insights. The study will focus on a diverse set of participants numbering approximately 100 individuals Malaysian, aged between 18 to 60 years, representing a balance of genders and an array of ethnic backgrounds including Malay, Chinese, Indian, and other minorities in Malaysia. The participants will also vary in terms of socioeconomic status, educational level, and geographical location within Malaysia. No specific learning characteristics are considered applicable in the context of this study. An online questionnaire will be distributed to the public and respondents via Google Form. The purpose is to ensure that the results are statistically significant and are representative of a fair sample size.

*Theoretical Framework*

Conceptual framework in Fig. 1 was built based on the basis on underpinned framework. This represents the researcher's position on the research problem and the theoretical basis for the study. It is a logical system of concepts that guides the research questions, objectives, methodology, and data analysis and the influence on independent variables and dependent variables.



Theoretical Framework

*Data Analysis Method*

This study proposed to use the suggestion of preliminary analysis, descriptive analysis, measurement model, regression analysis, factor analysis, and future projection models to interpret the data.

After collecting the primary data from the questionnaires, the data will be analysed through SMART PLS software. To analyse the outcome of the model, Partial Least Squares Structural Equations Modelling (PLS-SEM) will be used as the sampling technique. The reason SMART PLS software is used is because of its strength where reliability and validity results can be constructed with small sample sizes. Other than this, SMART PLS can modify the abnormal data with the central limit theorem to maximize the R square and minimize the errors.

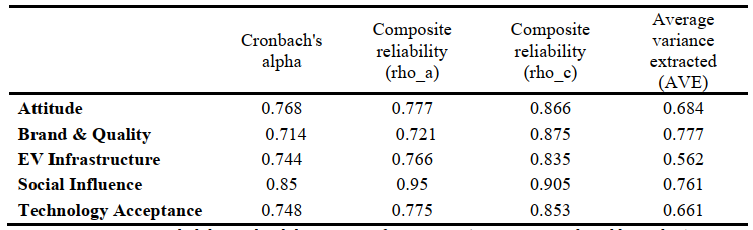
**results**

In this section, the data collected from the questionnaire will be analysed and interpreted. By using SMART PLS Software to compute the data, descriptive analysis of the final result will be presented.

*Construct Validity And Reliability*

The dataset in Table I has shown to detail the reliability and validity metrics of constructs measured in a survey or a study related to attitudes, brand and quality, EV infrastructure, social influence, and technology acceptance.

Reliability and Validity Metrics of Constructs



The dataset in Table I has presented a reliability and validity analysis for several constructs within a research study. Cronbach's alpha values range from 0.714 for "Brand & Quality" to 0.85 for "Social Influence," indicating acceptable to good internal consistency among items within each construct, with "Social Influence" being the most reliable.

Generally, a Cronbach's alpha above 0.7 is considered acceptable, suggesting that the items within each construct are consistently measuring the same underlying concept. The composite reliability (rho\_a) and (rho\_c) offer alternative measures of internal consistency, with rho\_a being slightly lower across constructs compared to rho\_c. For example, "Attitude" has a composite reliability of 0.777 (rho\_a) and 0.866 (rho\_c), both of which are above the threshold of 0.7, reinforcing the reliability of this construct. "Social Influence" scores particularly high in both measures (0.95 and 0.905), emphasizing the consistency of the responses.

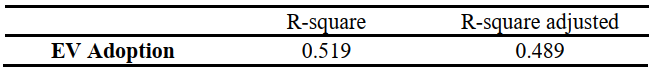
Average Variance Extracted (AVE) values measure the amount of variance captured by the construct in relation to the variance due to measurement error, with values above 0.5 indicating adequate convergent validity. "Brand & Quality" scores the highest AVE at 0.777, showing that a substantial amount of variance in the observed variables is accounted for by the construct. "EV Infrastructure," however, has an AVE of 0.562, which is just above the acceptable limit, suggesting that while it meets the criteria for convergent validity, it does so marginally.

In overall, the dataset above indicated that the survey or study exhibits good reliability and convergent validity for the constructs measured, signifying that the scales used are appropriate for assessing the theoretical constructs and are likely to produce consistent results across similar studies.

*R-Square*

Based on past researches under discipline of marketing, the rule of thumb for R2 value of 0.25, 0.5, 0.75, represent weak, moderate, substantial respectively.

R-Square



The dataset in Table II has provided contains R-square and adjusted R-square values for a statistical model predicting electric vehicle (EV) adoption.

R-square, or the coefficient of determination, is 0.519 for EV Adoption. This means that approximately 51.9% of the variance in EV adoption can be explained by the independent variables included in the model. It is a measure of the goodness-of-fit of the model, indicating how well the independent variables collectively explain the dependent variable.

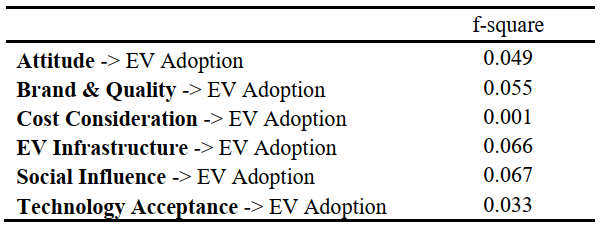
The adjusted R-square value is slightly lower at 0.489. The adjusted R-square modifies the R-square value to account for the number of independent variables in the model relative to the number of data points. It provides a more accurate measure of the model's explanatory power, especially when comparing models with a different number of predictors. The fact that the adjusted R-square is close to the R-square value suggests that the model has not been overly penalized for the number of predictors it contains, which imply that the number of independent variables is appropriate for the sample size.

In overall, an adjusted R-square of 0.489 is quite substantial, suggesting that the model has a robust predictive power.

*F-Square*

F2 value is aim to measure magnitude of the effect of independent variables on dependent variables. The rule of thumb for effect size of 0.35, 0.15, 0.02, is described as large effect, medium effect, and small effect respectively.

F-Square



The dataset provided showcases the F-square values for various predictors within a model aim at understanding factors affecting electric vehicle (EV) adoption. The F-square value is a measure of effect size used to quantify the strength of the relationship between an independent variable and the dependent variable within the context of a structural equation model.

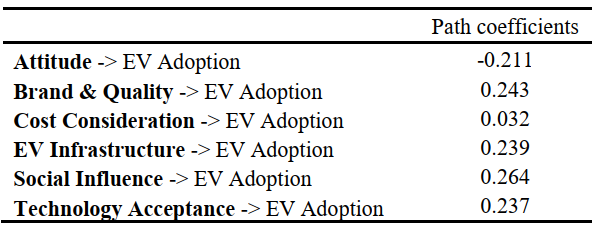
By analysing the F-square values in the table above, author has observed that the relationship between 'Attitude' and 'EV Adoption' has an f-square of 0.049, which suggests a small but non-negligible effect. 'Brand & Quality' exhibits a slightly stronger relationship with 'EV Adoption,' indicated by an f-square of 0.055, again signifying a small effect size. 'Cost Consideration' has a least effect on the dependent variable. 'EV Infrastructure' is associated with an f-square of 0.066, and 'Social Influence' has an f-square of 0.067, both of which indicated a small to medium effect size and suggest these factors have a more substantial influence on EV adoption compared to the other variables. Lastly, 'Technology Acceptance' has an f-square of 0.033 with 'EV Adoption,' pointing to a smaller effect size than 'EV Infrastructure' and 'Social Influence,' but still a potential influence on the adoption decision.

In summary, the f-square values have indicated that while all the factors contribute to predicting EV adoption to varying degrees, 'Social Influence' and 'EV Infrastructure' appeared to be the strongest predictors among other factors. 'Cost Consideration' seems to have the least impact, and 'Attitude,' 'Brand & Quality,' and 'Technology Acceptance' have modest effects. These insights could be crucial for stakeholders looking to develop strategies to increase EV adoption rates, as they highlight the relative importance of different factors influencing individuals' decisions.

*Path Coefficients*

The dataset in Table IV outlines path coefficients from a structural equation model, which measure the strength and direction of the relationships between various independent variables and the dependent variable, which in this case is EV Adoption.

Path Coefficients



The path coefficient for 'Attitude -> EV Adoption' is -0.211, indicating a negative relationship between the attitude towards electric vehicles and their adoption. This could suggest that the way attitude was measured or conceptualized in the study might be inversely related to adoption, or there could be other mediating factors affecting this relationship.

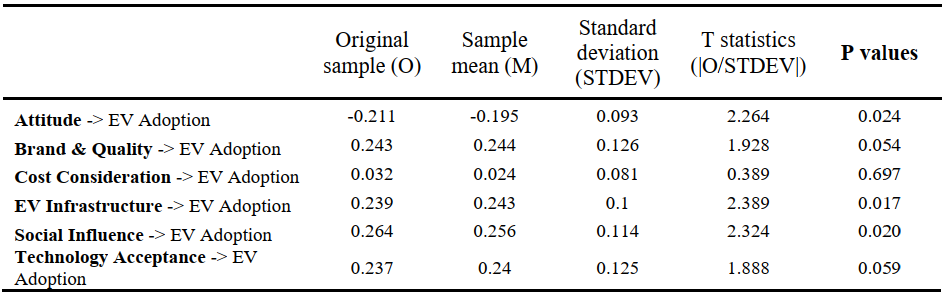
For 'Brand & Quality -> EV Adoption' shows a positive path coefficient of 0.243. This implies that a favourable perception of brand and quality is associated with an increased likelihood of adopting electric vehicles. It suggests that branding and quality perceptions are significant motivators for consumers when considering the adoption of electric vehicles.

On top of that, 'Cost Consideration -> EV Adoption' has a positive coefficient of 0.032, though the value is quite small, suggesting that cost considerations do play a role in the adoption decision, but it may not be a strong predictor compared to other factors. Besides that, 'EV Infrastructure -> EV Adoption' has a path coefficient of 0.239, indicating a strong positive relationship. This suggests that better electric vehicle infrastructure is likely to promote higher adoption rates. In addition, the path coefficient for 'Social Influence -> EV Adoption' is 0.264, suggesting that social influence is a significant predictor of EV adoption. This indicates that the social environment, including the opinions and behaviours of others, is influential in the decision to adopt electric vehicles. Lastly, 'Technology Acceptance -> EV Adoption' has a path coefficient of 0.237, which also indicates a positive relationship. This suggests that the acceptance of electric vehicle technology is a substantial factor driving their adoption. In overall, these coefficients suggest that while most factors positively influence EV adoption, the attitude as measured in the study has a negative impact. Brand and quality perceptions, social influence, and technology acceptance are highlighted as particularly influential in the decision-making process for EV adoption, with EV infrastructure also playing a key criteria. Cost consideration has the least impact among the variables considered.

*P Values*

Previous researchers’ study has shown that if P-value < 0.05, the model is significant. Therefore, the P values in the dataset in table IV has correspond to the statistical significance of the path coefficients in a structural equation model analysing factors are influencing electric vehicle (EV) adoption. These P values help determine whether the observed relationships between the predictors and EV adoption are statistically significant or could have occurred by chance.

P Values



For 'Attitude -> EV Adoption', the P value is 0.024, which is less than the conventional alpha level of 0.05, indicating that the negative relationship between attitude and EV adoption is statistically significant. This suggests that there is a high level of confidence that a more negative attitude is associated with lower EV adoption.

For 'Brand & Quality -> EV Adoption' has a P value of 0.054, which is slightly above 0.05, suggesting that while there is a positive relationship, it is not statistically significant at the 0.05 level. This could mean that brand and quality may not be as influence in determining EV adoption as some of the other variables in the model, at least at the conventional level of statistical confidence.

For 'Cost Consideration -> EV Adoption' has a P value of 0.697, which is much higher than 0.05. This indicates that the relationship between cost consideration and EV adoption is not statistically significant, implying that cost considerations might not play a substantial role in influencing EV adoption, or the sample data does not support such a relationship.

In addition, the relationship between 'EV Infrastructure -> EV Adoption' is significant with a P value of 0.017. This implies that improvements in EV infrastructure are likely to have a significant positive impact on EV adoption.

For 'Social Influence -> EV Adoption' has a P value of 0.02, also indicating a statistically significant positive relationship. This suggests that social influence is an important factor in EV adoption decisions.

Lastly, 'Technology Acceptance -> EV Adoption' shows a P value of 0.059, which is just above the typical threshold for statistical significance. This indicates a positive relationship that is marginally not significant at the 0.05 level, suggesting that technology acceptance may influence EV adoption, but additional data or research is needed to confirm this relationship.

In overall, the P values suggest that while some factors are statistically significant predictors of EV adoption, others, such as cost consideration is less clearly connected or require more evidence to establish a significant relationship.

**Conclusion**

The study "Analysis Factors Influencing Malaysians' Acceptance of Buying Electric Vehicle in the next 5 years" provides insightful conclusions about the key elements influencing the decision to purchase electric vehicles in Malaysia. It evaluates the influence of attitudes, brand perception, cost, infrastructure, social factors, and technology acceptance on their decision-making.

The research identifies social influence and EV infrastructure as the most significant factors driving this decision, indicating that the perception and behavior of others, along with the availability and accessibility of charging infrastructure, play pivotal roles in influencing potential buyers. Interestingly, cost considerations, often a primary concern in vehicle purchase decisions, were found to have a lesser impact on EV adoption decisions. This suggests that the decision to purchase an EV in Malaysia may be more closely linked to societal trends and practicality rather than just financial implications. These findings offer a comprehensive understanding of the various dimensions affecting EV adoption in Malaysia, highlighting the importance of not only improving the physical infrastructure but also leveraging social dynamics and addressing perceptual barriers to accelerate the transition towards electric vehicles.

For industry leaders and policymakers, the practical takeaway is to focus on infrastructure development and utilize community-driven initiatives to create a conducive environment for EV adoption. Electric vehicle (EV) adoption in Malaysia will require extensive infrastructure development. As a manager, it is crucial to anticipate and plan for charging station networks across the country. Collaborating with local governments, EV manufacturers, and other stakeholders will be essential to ensure an adequate number of charging points are available in residential areas, commercial establishments, and highways to alleviate range anxiety for potential EV owners.

Social influence being a significant factor implies that EV adoption can be greatly accelerated through community engagement and social proof. Managers should consider leveraging social media influencers, creating community-based initiatives, and showcasing success stories of early EV adopters. Positive word-of-mouth endorsements and visible support from respected community members could be pivotal in swaying potential buyers. For attitude, the negative relationship with EV adoption suggests that current consumer perceptions may be a barrier. Managers should focus on educational campaigns that reshape public opinion, highlighting the long-term benefits of EVs, such as cost savings on fuel and maintenance, and environmental advantages. Addressing misconceptions and providing clear, positive messaging about EVs could alter the prevailing attitudes.

In short, Malaysian managers should proactively address challenges and opportunities associated with EV adoption in the next five years. Strategic planning, collaboration, employee reskilling, and proactive engagement with stakeholders will be essential in successfully navigating the transition towards a sustainable and electrified future.

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# Article no 3: IMPACT OF COVID-19 PANDEMIC ON CHANGING CONSUMER BEHAVIOR

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***Abstract*—**The COVID-19 pandemic which has hit the World since 2020 has changed how consumers behave. The changes have both positive and negative implications to businesses and are forcing them to transform to meet the needs and demands of the consumers behavior post-COVID-19 pandemic. This research studies the determining factors which lead to a change in consumer behavior due to the COVID-19 pandemic. The use of quantitative approach using online survey and data collected will be analyzed using Smart PLS 3. This study found a new insight which had not been studied before in Malaysia- It is found out that substitution buying and spending power is significantly correlated with change in consumers behavior during COVID-19 pandemic. Contrary to common belief, the other determinants studied in this research including impulse buying, luxury indulgence, increase demand for health-related products and desire for online shopping all did not show significant relationships with change in consumer behavior. As the world is continuously experiencing changes due to the COVID-19 pandemic, this study hopes to provide insight to businesses on how to position themselves to face the change in consumer behavior.

**Keywords—Consumer Behavior, Substitution Buying, Spending Power, COVID-19**

**Introduction**

The COVID-19 pandemic has changed the way the world works. It is no doubt that the World post-pandemic is not the same as the one before the COVID-19 virus exists. In many aspects, the World functions differently. The way people think is no longer the same. Values that were important previously have become less important nowadays, while new ideas and values have emerged during the crisis.

COVID-19 has significant economic, social, and psychological impacts on mankind. The pandemic, which started in early 2020, has significantly transformed consumer buying behaviour, which has subsequently caused a sudden change in business operating model and sustainability. People have changed how and where they should spend their money (Roger, 2020). This is because environmentally-imposed constraints such as the COVID-19 pandemic will cause consumers to react, cope, and adapt to the new environment (Kirk, 2020).

Businesses that have transformed quickly enough survived, while those that are slow in response subsequently ceased operations. COVID-19 has caused the traditional business model to lose its attractiveness and the emergence of new and innovative business models. In the first 6 months since the implementation of Movement Control Orders (MCO), near to 30,000 businesses were forced to close down, based on the Entrepreneurship Development and Cooperation Ministry (Medac) (Auto, 2020). This is partially attributed to the change in consumer buying behaviour. While other factors such as logistics, finances, and turnover play a role in determining the survival of businesses, the core component is still the consumer’s buying behaviour. It is therefore important to understand the factors which lead to a change in consumer buying behaviour and the impact of each on businesses. Reported preliminary studies also suggest that the nature and extent of the impact of the COVID-19 pandemic are not similar across all citizens and depend on their condition of poverty, age, residential status, and other demographic variables (United Nations, 2020)

At the same time, this understanding is also important for businesses to track any buying behaviour which can be explored as new business opportunities, such as health-related and wellness-related industries and products. Market studies pertaining to the impact of COVID-19 on consumers have indicated increased spending on groceries, and health and hygiene products (Roger, 2020)

During the COVID-19 pandemic, especially during the MCO, Malaysians embraced online grocery shopping for its convenience and safety. Preference for contactless delivery and online payment methods has also became the norm. Certain local grocery chains quickly adapted, enhancing their online presence and delivery capabilities, while others, did not manage to change in time and was drastically affected by the reduction in revenue during the pandemic. Being able to understand changes in consumer behaviour like this, and to make swift decision to quickly adapt is no longer for greater revenue, but at challenging times like the pandemic, it is for the survival of the business.

According to a survey by Rakuten Insight on dietary supplements in Malaysia conducted in July 2022, 74 percent of respondents who took dietary supplements or nutraceuticals stated that their frequency of doing so increased after the outbreak of the COVID-19 pandemic. In response to the increase in health awareness, some local businesses increased the promotion of local and fresh produce to meet the growing demand for healthier food options. Beyond that, certain groceries stores or restaurants have also started sales of supplements and organic foods. All these will not be possible without first understanding the change in consumer buying behaviour.

The rate of closure of businesses is alarming, as it can affect not only the nation’s economy but can cause disastrous implications for households across the nation. During the same period of time, Malaysia’s economy plunged 17.1% in the second quarter of 2020, and a future 2.7% decline in the third quarter. (Kumar, 2021) Understanding the effect of changing consumer buying behaviour due to disasters such as the COVID-19 pandemic is important to equip businesses, especially Small and Medium Enterprises (SMEs) better for any future similar catastrophic event. The understanding is also essential to ensure that businesses can know what the consumer wants post-pandemic, and if those changes will be sustainable, or just a temporary effect due to the circumstances of the COVID-19 pandemic. Without this knowledge, it will be a challenge for businesses to ensure sustainability, resilience, and adaptability. Without these factors, they will be vulnerable to closure if the COVID-19 pandemic returns, or another similar pandemic occurs.

**literature review**

Abrupt events that are environmental, social, biological, cognitive, and behavioural in nature will cause changes in consumers’ behaviour (Mathur et al, 2006). This is what has been observed, and described by existing literature, even before COVID-19 exists. The adaptation in people’s buying behaviour during the COVID-19 pandemic has again proved this theory. It is therefore important to understand how a pandemic of such magnitude can impact, the factors which are involved, and the intensity of each on consumers’ buying behaviour.

In the past, similar health-related changing event has also affected economic activities significantly. However, some changes in consumers’ buying behaviour are rather unrelated to the economic impact, or the buying power of the consumer. People don’t buy less, or buy cheap during the pandemic. There are sometimes certain items that consumers favour buying during crises as such. For example, during Influenza A (H1N1) in 2009, consumers exhibited risk coping strategies, which caused a change in chicken meat consumption (Yeung, 2016).

A pandemic of global magnitude, such as COVID-19 has caused significant instability across the globe, affecting all nations politically, economically, as well as socially. All these caused instability and a state of fear in consumers. Consumers are therefore forced to seek stability (Minto et al., 2021). Consumers, therefore, become more conservative and are more careful and rational in spending. One phenomenon that is observed is consumers becoming more price sensitive (Hampson et al, 2013). They tend to choose more economical items and are more cautious about buying in bulk. The purchase of essentials is also in favour as compared to the purchase of luxuries. This change is due to the human nature of desiring to keep money in anticipation of an emergency. Similar behaviour can also be observed during other crises such as floods, fires, and terrorist attacks. Understanding this behaviour will help us understand how consumers' buying behaviour changes during the COVID-19 pandemic as well.

However, in contrast, during some other disasters, it is observed that consumers adopt a stress induced compulsive and impulsive buying behaviour. This was observed among the Gulf Coast residents during Hurricane Katrina in New Orleans (Sneath et al, 2009). Such behaviour can also be observed during the COVID-19 pandemic when Circuit Breaker is announced in Singapore. According to research, 63% of panic buyers rated price as the most important factor when making purchases. In order to avoid paying higher prices later, they opt for bulk purchases. Not only that, some researchers also suggested that panic buyers are more likely to be from homes with infants or elderly, who require specialized supplies like milk powder and diapers. Hence, a lot of panic buying was to protect more vulnerable members from the shortage (Cornell University, 2022).

**research methodology**

This is a quantitative study, in which data are collected through measuring variables. There are dependent and independent variables involved in this study. All of these can be measured on a scale, and subsequently used to be analysed through numerical comparisons and statistical inferences. The data will then be reported through statistical analysis. This is also a cross-sectional study, in which data will be collected from a sample population at a specific moment. Exposure and outcomes are measured simultaneously. To be more specific, this is an analytical cross-sectional study, in which the relationship between the COVID-19 pandemic and consumers’ buying behaviour will be evaluated.

Target respondents are individuals from a variety of organizations in the different industry that are residing in Malaysia since before the COVID-19 pandemic. Respondents across all age groups will be targeted, focusing on working adults. At the same time, respondents from all classes of household income will also be included in order to study the impact of the COVID-19 pandemic on changing consumer behaviour. 384 respondents who are employed in Malaysia and are at least 18 years old will make up the sample size for this study.

*Conceptual Framework*

The conceptual framework is based on how the COVID-19 pandemic influences consumers’ buying behaviour. Secondly, it measures how the COVID-19 pandemic influences occupations, household income, employment status, and insecurity. These variables will then have effects on affordability, lifestyle changes, health awareness, and retailers’ precautions. Subsequently, they will affect consumers’ buying behaviour as measured by spending power, new demand for health related products, substitutions, impulse buying, luxury indulgence, and digital platforms. All of which are parameters to indicate changes in consumers’ buying behaviour. Variables are interrelated to one another but ultimately show that the COVID-19 pandemic has an influence on consumers’ buying behaviour.

A diagram of a company's market

Description automatically generated

Conceptual Framework

These variables will then have effects on affordability, lifestyle changes, health awareness, and retailers’ precautions. Subsequently, they will affect consumers’ buying behaviour as measured by spending power, new demand for health related products, substitutions, impulse buying, luxury indulgence, and digital platforms. All of which are parameters to indicate changes in consumers’ buying behaviour. Variables are interrelated to one another but ultimately show that the COVID-19 pandemic has an influence on consumers’ buying behaviour.

*Data Analysis Method*

With the aid of the Smart PLS 4 3 software, the partial least square structural equation modelling approach (PLS-SEM) will be used to evaluate and interpret the reliability and validity of the variables in the conceptual framework. The calculation and evaluation of the measurement model's composite reliability, average variance extracted, and discriminant reliability are aided by the PLS-SEM. Then, in order to increase the study's reliability and validity, the results of each variable are utilized to analyse their convergent and discriminant validity.

**results**

The measurement model and the structural model are both validated in this study using structural equation modelling (SEM) analysis. SEM techniques were used to examine the connections between the exogenous and endogenous variables.

*Structural Model*

The results of the PLS-SEM Analysis, which involved assessing the measurement model (outer) using the PLS method and then applying the structural model using bootstrapping - 5000 samples, are the main emphasis of this section. Prior to the relationship's validity and reliability being tested, this is essential. Fig. 2 illustrates the suggested PLS structural model for this study based on the research framework.

A diagram of a network

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Measurement Model of the Study Construct by Author

*Path Coefficient*

Table I presents path coefficients from a structural equation model (SEM) or a path analysis. These coefficients represent the relationships between different constructs or variables. In this context, the constructs on the left (e.g., “Desire for Online Shopping,” “Impulsive Buying,” etc.) are independent variables or predictors, while “Consumer Behaviour” on the right is the dependent variable or outcome.

Path Coefficients

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Description automatically generated

Desire for Online Shopping -> Consumer Behavior (0.734): This path coefficient of 0.734 represents the strength and direction of the relationship between “Desire for Online Shopping” (the predictor or independent variable) and “Consumer Behavior” (the outcome or dependent variable). A positive coefficient (0.734) suggests a positive relationship between these two constructs, indicating that as desire for online shopping increases, consumer behavior tends to increase as well. In other words, higher levels of desire for online shopping are associated with more consumer behavior.

Impulsive Buying -> Consumer Behavior (0.375): This path coefficient of 0.375 represents the relationship between “Impulsive Buying” and “Consumer Behavior.” A positive coefficient (0.375) indicates a positive relationship, suggesting that higher levels of impulsive buying tend to be associated with higher levels of consumer behavior.

Luxury Indulgence -> Consumer Behavior (-0.095): This path coefficient of -0.095 represents the relationship between “Luxury Indulgence” and “Consumer Behavior.” The negative coefficient (-0.095) suggests a negative relationship, indicating that higher levels of luxury indulgence are associated with lower levels of consumer behavior. In other words, there may be a reduction in consumer behavior when individuals are more focused on luxury

New Demand for Health-Related Products -> Consumer Behavior (-0.06): This path coefficient of -0.06 represents the relationship between “New Demand for HealthRelated Products” and “Consumer Behavior.” The negative coefficient (-0.06) suggests a negative relationship, indicating that higher levels of new demand for health-related products are associated with lower levels of consumer behavior.

Spending Power -> Consumer Behavior (0.01): This path coefficient of 0.01 represents the relationship between “Spending Power” and “Consumer Behavior.” The very small positive coefficient (0.01) suggests a weak positive relationship. It indicates that there is a slight positive association between spending power and consumer behavior, but the relationship is very weak.

Substitution Buying -> Consumer Behavior (-0.198): This path coefficient of -0.198 represents the relationship between “Substitution Buying” and “Consumer Behavior.” The negative coefficient (-0.198) suggests a negative relationship, indicating that higher levels of substitution buying are associated with lower levels of consumer behavior.

In summary, these path coefficients provide insights into the strength and direction of the relationships between different constructs or variables and “Consumer Behavior.” Positive coefficients indicate positive relationships, negative coefficients indicate negative relationships, and the magnitude of the coefficient represents the strength of the relationship. These coefficients are crucial for understanding how various factors influence consumer behavior in the context of the model or analysis they are derived from.

*Coefficient of Determination (R2)*

The following table presents R-squared (R²) and adjusted R-squared (R² adjusted) values for the “Consumer Behaviour” variable in a regression model.

R-squared (R²) and Adjusted R-squared (R² adjusted)

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Description automatically generated

In this context, an R² value of 0.548 means that approximately 54.8% of the variability in Consumer Behaviour is explained by the predictors included in the model. The R² value ranges from 0 to 1. A value of 1 would indicate that the model explains 100% of the variance in the dependent variable, while a value of 0 suggests that the predictors have no explanatory power.

R² adjusted is particularly useful when comparing models with different numbers of predictors because it adjusts for model complexity. In this context, an R² adjusted value of 0.546 means that approximately 54.6% of the variability in Consumer Behaviour is explained by the predictors in the model, while also accounting for the model's complexity due to the number of predictors.

In summary, these statistics indicate how well the independent variables in the regression model collectively explain the variation in Consumer Behaviour. An R-squared of 0.548 suggests that a significant portion of the variability in Consumer Behaviour can be accounted for by the predictors. The adjusted R-squared of 0.546 adjusts this value to account for model complexity, providing a slightly more conservative estimate of the explanatory power of the model while considering the number of predictors. These values are important for evaluating the overall fit and usefulness of the regression model in explaining the target variable.

*Hypotheses Testing*

Table III presents the p-values associated with each predictor variable. P values indicate the significance of the relationship between each predictor and Consumer Behavior.

P Values for Hypotheses Testing

A table of numbers and symbols

Description automatically generated with medium confidence

In hypothesis testing, p-values help determine whether the observed relationship is statistically significant. Smaller p-values (typically below a predefined significance level, such as 0.05) suggest a more significant relationship.

Desire for Online Shopping -> Consumer Behavior:

H01: The COVID-19 pandemic changing consumer behavior has no significant relationship with substitution buying.

H11: The COVID-19 pandemic changing consumer behavior has a significant relationship with substitution buying.

The coefficient is 0.734, indicating a positive relationship between Desire for Online Shopping and Consumer Behavior. The t-statistic is 8.051, which is quite large, suggesting that the relationship is statistically significant. The p-value is 0, indicating that the relationship is highly significant. Null hypothesis rejected. Alternate hypothesis accepted. The COVID-19 pandemic changing consumer behavior has a significant relationship with substitution buying.

Impulsive Buying -> Consumer Behavior:

H02: The COVID-19 pandemic changing consumer behavior has no significant relationship with spending power.

H12: The COVID-19 pandemic changing consumer behavior has a significant relationship with spending power.

The coefficient is 0.375, indicating a positive relationship between Impulsive Buying and Consumer Behavior. The t-statistic is 4.922, indicating that this relationship is statistically significant. The p-value is 0, indicating a highly significant relationship. Null hypothesis rejected. Alternate hypothesis accepted. The COVID-19 pandemic changing consumer behavior has a significant relationship with spending power.

Luxury Indulgence -> Consumer Behavior:

H03: The COVID-19 pandemic changing consumer behavior has no significant relationship with luxurious indulgence

H13: The COVID-19 pandemic changing consumer behavior has a significant relationship with luxurious indulgence.

The coefficient is -0.095, suggesting a negative relationship between Luxury Indulgence and Consumer Behavior. The t-statistic is 0.785, indicating that this relationship is not statistically significant. The p-value is 0.432, which is greater than the typical significance level of 0.05, indicating non-significance. Null hypothesis accepted. Alternate hypothesis rejected. The COVID-19 pandemic changing consumer behavior has no significant relationship with luxurious indulgence

New Demand for Health-Related Products -> Consumer Behavior:

H04: The COVID-19 pandemic changing consumer behavior has no significant relationship with impulse buying.

H14: The COVID-19 pandemic changing consumer behavior has a significant relationship with impulse buying.

The coefficient is -0.06, suggesting a negative relationship between New Demand for HealthRelated Products and Consumer Behavior. The t-statistic is 0.647, indicating that this relationship is not statistically significant. The p-value is 0.518, indicating non-significance. Null hypothesis accepted. Alternate hypothesis rejected. The COVID-19 pandemic changing consumer behavior has no significant relationship with impulse buying.

Spending Power -> Consumer Behavior:

H05: The COVID-19 pandemic changing consumer behavior has no significant relationship with new demands for health-related products.

H15: The COVID-19 pandemic changing consumer behavior has a significant relationship with new demands for health-related products.

The coefficient is 0.01, indicating a positive relationship between Spending Power and Consumer Behavior. The t-statistic is 0.18, indicating that this relationship is not statistically significant. The p-value is 0.858, indicating non-significance. Null hypothesis accepted. Alternate hypothesis rejected. The COVID-19 pandemic changing consumer behavior has no significant relationship with new demands for health-related products.

Substitution Buying -> Consumer Behavior:

H06: The COVID-19 pandemic changing consumer behavior has no significant relationship with the desire for online shopping.

H16: The COVID-19 pandemic changing consumer behavior has a significant relationship with the desire for online shopping.

The coefficient is -0.198, suggesting a negative relationship between Substitution Buying and Consumer Behavior. The t-statistic is 1.936, indicating that this relationship is statistically significant, although it has a relatively smaller effect size compared to the others. The p-value is 0.053, which is close to but slightly above the typical significance level of 0.05, indicating borderline significance. Null hypothesis accepted. Alternate hypothesis rejected. The COVID-19 pandemic changing consumer behavior has no significant relationship with the desire for online shopping.

**Conclusion**

The COVID-19 pandemic has affected the way society functions. It has also changed consumer behavior. The implication of the changes is real. Since 2020, the way business functions have changed to adapt to the new way consumers behave. Some have successfully identified what the consumers want, and therefore thrive; while the rest have failed to do so, and therefore are still struggling to survive. As the saying ‘customer is always right’, it is important to understand what the consumers want in order to survive in the post-COVID-19 era.

This study attempts to identify the factors which have resulted in a change in consumer behavior due to the COVID-19 pandemic. A cross-sectional survey was being carried out from July 2023 to September 2023 among Malaysians to understand what has led to a change in consumer behavior. A total of 385 respondents have participated in the survey, which was done via Google Form. The survey focuses on factors including substitution buying, spending power, luxurious indulgence, impulse buying, new demands for health-related products, as well as desire for online shopping.

Data collected was then analyzed to study the relationship between the dependent variables and the independent variables. This is done via Smart PLS 4 3 software, in which the reliability and the validity of the study has been verified. Several tests have subsequently been run through. The hypotheses of the study were also being tested, in which some null hypotheses were accepted, while for others, the null hypotheses were rejected, and the alternate hypotheses were accepted.

The COVID-19 pandemic changing consumer behavior has a significant relationship with 2 of the 6 variables studied. They are substitution buying and spending power. The change in consumer behavior due to the COVID-19 pandemic is therefore significantly affected by these two factors. On the other hand, the remaining 4 variables studied showed no significant relationship with the COVID-19 pandemic changing consumer behavior. These 4 variables are impulse buying, luxury indulgence, new demands for health-related products and desire for online shopping. These findings oppose what the public, and many businesses would perceive the change in the way consumers behave.

The study has provided a better understanding of the change in consumer behavior due to COVID-19 pandemic, from the Malaysia perspective. Businesses in Malaysia will be able to have a better insight on these changes and can plan their business strategy for the future. The COVID-19 pandemic changing consumer behavior has a significant relationship with spending power and substitution buying, and no significant relationship with luxurious indulgence, impulse buying, new demands for health-related products, and desire for online shopping.

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# Article no 04:AN INVESTIGATION OF THE ROLE OF INFLUENCER MARKETING IN THE GROWTH PERFORMANCE OF FMCG BRAND

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***Abstract*—** In today's dynamic marketing landscape, influencer marketing has become an important driver of growth for Fast-Moving Consumer Goods (FMCG) brands. This study focuses on the role of influencer marketing in enhancing FMCG brand growth, particularly in the Malaysian market. Influencers develop authentic connections with their followers, establishing trust that enhances brand reputation, which is critical factor for FMCG products where quick decisions are based on trust. Influencers skilled at targeting specific demographics, ensuring the brand's message reaches its intended audience, optimizing return of investment (ROI). Their original and engaging content effectively highlights FMCG product features, benefits, and usage, enhancing consumer education. This research identifies the impact of influencer marketing variables on FMCG brand sales, aiding marketers in optimizing strategies. A quantitative survey method was used, collecting data from active social media users. Variables examined include Number of Followers, Originality of Content, and Follower-Brand Fit. Results reveal that Originality of Content has the most significant positive impact on campaign success, followed by Follower-Brand Fit, while the Number of Followers has a minor or negligible effect. These findings provide marketers and researchers with valuable insights, highlighting the importance of content originality in influencer marketing success for FMCG brands. In summary, influencer marketing remains an important tool for FMCG companies to boost brand awareness and sales, with content originality as a key driver of success.

**Keywords—Influencer, Marketing, Performance**

**Introduction**

The impact of border closures and travel restrictions stemming from the global COVID-19 pandemic has rippled across numerous sectors, with the Fast-Moving Consumer Goods (FMCG) industry being no exception. Since the initial outbreak of COVID-19 in January 2020, countries around the world have implemented a range of measures aimed at curbing the virus's spread. These measures, while essential for public health, have had profound implications for both businesses and consumers.

During the Covid-19 pandemic, countries are in lockdown, shops have imposed various restrictions, and governments are actively encouraging people to stay at home to contain the spread of the virus. When the Covid-19 outbreak in Jan 2020, nearly all countries imposed restrictions on the movement of people to contain the COVID-19 pandemic. The restriction measures include border closures, country lockdown, quarantine requirement, discouragement of in-person shopping, and suspension of closed contact in-store promotion activities. Consumers are reluctant to shop in person; therefore online channel became the alternative to crowded stores and in-person shopping. Even though online channels have grown in popularity and sales growth has been steady over the past decade, mass consumer acceptance only happened after the arrival of Covid-19. The Organization for Economic Co-operation and Development (OECD) reported that almost all countries experienced a fall in services imports and exports with the outbreak of COVID-19. The drop was unprecedented in magnitude and more pronounced than during the global financial crisis (OECD. 22 Jan 2021).

Businesses that continued to rely on traditional distribution model and traditional marketing media were hit hard during Covid-19, but those that noticed this online trend and quickly adjusted and adapted to this new shopping model managed to regain sales. As reported in Influencer-Marketing-Hub by Werner Geyser in 23 Nov 2022, total global retail ecommerce sales was $1,336 billion in 2014. It was doubled to $2.982 billion by 2018. And this was nearly doubled again to an estimated $5.542 million by 2022 despite the Covid-19 pandemic. Some well-known FMCG brands have taken note of this online trend and have partnered with influencers to create content to encourage consumers to purchase products online, in an attempt to regain sales and market share. This has encouraged more companies to explore influencer marketing as one of their key marketing strategies to drive brand growth. As reported in Influencer-Marketing-Hub on 07 Feb 2023, the market size of influencer marketing which was at $1.7 billion in 2016, has grown to $9.7 billion in 2020 and expected to reach $16.4 billion in 2022. That is over 960% growth in just 6 years.

The research gap in the context of social media influencer marketing in Malaysia is particularly noticeable when considering the shortage of studies focusing on Malaysian FMCG (Fast-Moving Consumer Goods) brands and their growth under the influence of influencer marketing. While there is a growing body of research on this marketing trend from an international perspective, the unique dynamics of the Malaysian market remain largely unexplored in this context. The existing studies referenced, such as Vrontis et al. (2021), Moghimi (2024) and Leung et al. (2022) provide valuable insights into influencer marketing practices and outcomes in diverse global settings. However, these studies may not fully capture the nuances of the Malaysian consumer landscape, the specific behaviors of Malaysian social media users, and the distinct strategies employed by Malaysian FMCG brands.

The significance of this research gap becomes clearer when considering the cultural, linguistic, and socio-economic factors that shape consumer behavior and preferences in Malaysia. These unique contextual elements can have a profound impact on how influencer marketing is executed and its subsequent effects on FMCG brand growth within the Malaysian market. Moreover, the FMCG sector in Malaysia presents its own set of challenges and opportunities, influenced not only by factors like competition, pricing strategies, and consumer loyalty. Understanding how influencer marketing interacts with these dynamics is vital for both marketers and researchers seeking to optimize marketing strategies in the region.

Therefore, this study aims to fill this gap by conducting a comprehensive analysis of how influencer marketing influences several key factors related to FMCG brand growth in the Malaysian market. Specifically, the study seeks to explore the impact of influencer marketing on three critical aspects: (i) Number of Followers, (ii) Originality of Content and (iii) Follower-Brand Fit. Addressing this research gap in the Malaysian context helps to refine and customize influencer marketing strategies to better meet the unique needs and expectations of both Malaysian consumers and FMCG brands, promoting more effective and culturally resonant marketing practices in this region.

**Literature review**

Fast-moving consumer goods (FMCG) are also called consumer packaged goods (CPG). These products, which are typically found on the shelves of retail establishments (such as supermarkets/grocery stores/convenient stores), fast selling and at affordable prices. FMCG products generally have a short shelf life and are regularly purchased and consumed rapidly (Lacy et al., 2020). FMCG companies invest heavily on advertising to market their brands and products to influence consumer behaviour and raise brand awareness (Malhotra, 2014; Farmer, 2013).

Traditionally, FMCG brands have relied on traditional advertising channels such as television, radio, print media, and billboards to reach their target audiences. However, the emergence of influencer marketing represents a paradigm shift in how these companies connect with consumers.

Influencer marketing is a dynamic and rapidly evolving form of marketing that has gained immense popularity in recent years (Deges, 2018). It involves utilising the influence and reach of social media influencers to promote products, services, or brands to their loyal followers. Influencer marketing has emerged as a powerful strategy due to the increasing impact of social media platforms on consumer behaviour and the rise of individuals who have amassed large online followings.

For the past decade, influencer marketing has been an active marketing strategy in the fashion, travel and fitness industries. As a result of the Covid-19 pandemic, FMCG companies are also aggressively using influencers to drive consumers to buy their products. Many FMCG brands are even shifting their marketing spend towards influencer marketing to drive their sales and awareness campaigns. According to Geyser (2022), FCMG go hand in hand with influencer marketing. The Influencer Marketing marketplace (Zefmo), found that the FMCG category was the highest spender on influencer marketing in 2021, increasing their spending by more than 62%, compared to an average of 40% across all sectors.

In the conference paper, Title: The possibilities of Influencer Marketing in FMCG sector, written by professor Ákos Varga PhD, stated that “Influencer marketing, originated from Word of Mouth, is a way of persuading people to buy a product using endorsements.”

Into the era of modern marketing, as Geyser (2022) pointed out that influencer marketing grew out of sponsorship marketing. Case in point is Michael Jordan, the world-renowned American former professional basketball player known for his Nike and Coca-Cola commercials in the 80s and Gatorade commercials in the 1990s. However, Michael Jordan is considered a “celebrity influencer”.

Many marketers agree that the beginnings of online influencer marketing can be traced back to the early days of social media when bloggers and YouTubers began to gain large audiences and followers and influence over their followers' purchasing decisions (Jin et al., 2019). These digital personalities offered a more intimate and interactive way for brands to engage with their target demographics, challenging the conventional advertising methods. Brands quickly recognized the value of collaborating with these online influencers to promote their brand and products because they offered a more personal and engaging way to connect with target audiences online compared to traditional advertising methods (Taylor, 2020).

As social media platforms like Facebook, Instagram, YouTube, TikTok, and Snapchat expanded in popularity, the number and variety of online influencers also grew rapidly, making it an integral component of modern marketing strategies, particularly in the FMCG sector. This evolution underscores the necessity for detailed research and analysis, such as the study outlined in the opening context, to understand the subtleties of influencer marketing's impact on fast moving consumer goods businesses and brand in specific markets such as Malaysia.

**research methodology**

The research method for this research is quantitative survey method (questionnaire) among a group of active social media users to obtain primary data.

*Conceptual Framework*

Based on the literature review the following research framework was developed

A diagram of influencer marketing

Description automatically generated

Conceptual Framework

*Data Analysis Method*

Smart PLS 4 software is used to generate the structural model and to test the proposed hypotheses. The partial least square structural equation modelling (PLS-SEM) will be used to evaluate and interpret the reliability and validity of the variables in the conceptual framework, with the assistance of Smart PLS 4 software. The PLS-SEM is use to assist in the calculation and evaluation of composite reliability, average variance extracted and discriminant reliability of the measurement model. PLS-SEM is often considered more suitable for smaller sample sizes, making it a valuable option in cases where collecting a large dataset is challenging. It is more robust in situations with limited data.

**results**

The data collected from the surveys were analysed and interpreted using SMART PLS 4 Software. This study applied the partial least square structural equation modelling (PLS-SEM) analysis to validate the measurement model and the structural model.

*Outer Model*

The outer model focuses on how well the observed variables reflect the underlying constructs they are intended to measure. The outer model typically involves tasks such as assessing the reliability and validity of the measurement model. The outer model in SmartPLS is a critical part of the SEM analysis process.

A total of 87 respondents were collected in the survey. The Outer Model based on research framework is shown in Fig. 2. Based on the result of the analysis for reliability, all constructs of the outer loadings have a value that is greater than 0.7, except for two of the items are slightly below 0.7, with 0.632 (NF5) and 0.614 (IM3). Overall results showed that the indicators reliability is sufficient.

A diagram of a network

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Outer Model

*Path Coefficient*

Path Coefficients are used to assess the model’s validity to evaluate the relationships between the variables. Path coefficients are also referred to as standardized regression coefficients or beta weights.

Path Coefficients (constructed by author)

A close-up of a list of words

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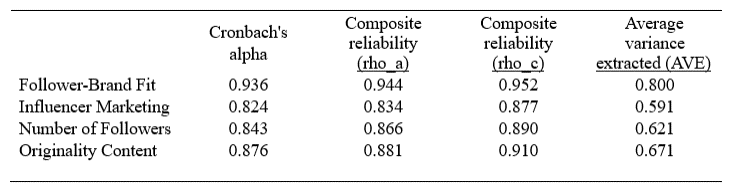
In Table 4.1, there are three variables: Follower-Brand Fit, Number of Followers, and Originality Content, which are all independent variables (predictors), and a dependent variable: Influencer Marketing. The path coefficients indicate the strength and direction of the relationships between each independent variables and the dependent variable.

In summary, the path coefficients indicate how three independent variables (Follower-Brand Fit, Number of Followers, and Originality Content) are related and influence the dependent variable "Influencer Marketing" in the framework of influencer marketing campaigns. These coefficients provide insights into the strength and direction of these relationships, the higher the value of the path coefficient, the stronger the effect of the independent variable on the dependent variable.

*Construct Validity and Reliability*

Construct validity and reliability are two important concepts in research and measurement. They are important in ensuring the research measures are reliable and valid. Reliability refers to the consistency and stability of a measurement. A reliable measure should achieve consistent results when administered repeatedly under similar conditions or circumstances.

Construct Validity and Reliability (constructed by author)

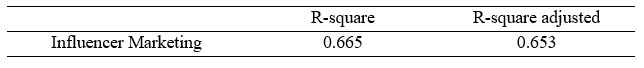


Based on the results in Table II, all of the constructs in this data have Cronbach's Alpha values greater than 0.7, showing high internal consistency reliability. In addition, all composite reliability values in the table are greater than 0.7, generally very high (close to 1), suggesting strong internal consistency reliability for all constructs. For convergent validity, AVE values of 0.5 or higher are generally considered acceptable. All the constructs in this data have AVE values above 0.5, indicating good convergent validity.

*Coefficient of Determination (R2)*

R-square (R²) and R-square adjusted (R² adjusted) are statistical measures commonly used in regression analysis to assess how well a statistical model fits the data. R-square (R²) also known as the coefficient of determination, represents the proportion of the variance in the dependent variable (DV) that is explained by the independent variables (IVs) in the regression model. It is a value between 0 and 1, where 0 indicates that the independent variables have no explanatory power, and 1 indicates a perfect fit, meaning that all the variance in the dependent variable is explained by the independent variables. R-square adjusted (R² adjusted) is a modification of the R-square value that adjusts for the number of independent variables in the regression model. It adjusts for the potential overfitting that can occur when inclusion of unnecessary variables that may not truly contribute to explaining the dependent variable.

R-square and R-square adjusted (constructed by author)



An R-square value of 0.665 means that approximately 66.5% of the variance in the Influencer Marketing variable can be explained by the independent variables (IVs) included in the model. In other words, the independent variables (Follower-Brand Fit, Number of Followers, and Originality Content), account for about two-thirds of the variability observed in Influencer Marketing.

An adjusted R-square value of 0.653 means that after accounting for the number of predictors in the model, approximately 65.3% of the variance in the Influencer Marketing variable is explained. This adjusted value provides a more conservative estimate of how well the model fits the data. The value of R-square adjusted is slightly lower than the R-square. The idea is to prevent overfitting, making it a helpful measure when evaluating the model's overall goodness of fit.

*Hypotheses Testing*

The P-value, also known as the probability value, is a statistical measure used in hypothesis testing to determine the strength of evidence against the null hypothesis. The null hypothesis (H0) is a declaration that there is no effect, difference, or relationship between variables. In other words, the P-value is used to determine the statistical significance of the relationships between the predictor variables and the dependent variable. Smaller p-values indicate stronger evidence against the null hypothesis and suggest a significant relationship between the predictor variable and the dependent variable. A larger P-value suggests weaker evidence against the null hypothesis, indicating that the observed results are more likely to be consistent with random chance.

P Value (constructed by author)

A table of analysis results

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The p-value 0.026 is less than the common threshold for significance level of 0.05, suggesting that the relationship between Follower-Brand Fit and Influencer Marketing is statistically significant. In other words, Follower-Brand Fit has a significant effect on Influencer Marketing.

The p-value 0.358 is greater than the common threshold for significance level of 0.05, suggesting that the relationship between the Number of Followers and Influencer Marketing is not statistically significant. In other words, there is no strong evidence to conclude that the Number of Followers variable in influencer marketing is different from what would be expected by random chance.

The P-value for Originality Content is 0.000, which is very close to zero. This indicates that the relationship between Originality Content and Influencer Marketing is highly statistically significant. This means that Originality Content has high significant effect on Influencer Marketing.

In summary, these statistics help to assess the significance of the estimated path coefficients in the model. A low P-value suggests that the relationship is likely not due to chance and is statistically significant, while a high P-value suggests that the relationship may not be statistically significant.

**Conclusion**

In today's dynamic marketing landscape, influencer marketing is an important driver of growth for FMCG brands. Fast-moving consumer goods (FMCG), which are known for their frequent purchases and low price points, benefit from the particular advantages that influencers can offer. Influencers build authentic connections with their followers, building trust that translates into brand credibility. This trust is especially crucial for FMCG brands, where consumers often make quick decisions based on familiarity and trustworthiness. Moreover, influencers can efficiently target specific demographics, ensuring that the brand's message reaches its intended audience, maximizing ROI. Influencer’s original content, often visual and interactive, effectively showcases FMCG product features, benefits, and usage, enhancing consumer education. Influencer marketing is a powerful tool for FMCG brands, fostering growth through trust-building, effective targeting, and engaging content. As this marketing strategy continues to evolve, its role will continue to be essential for FMCG companies to drive brand awareness and sales.

This study found that among the factors being studied, Originality Content has the most substantial and positive influence on the success of the influencer marketing campaign, followed by Follower Brand Fit with a moderate positive impact. Contrary to what is traditionally believed, it is discovered that the number of followers has a relatively little or negligible positive impact, suggesting that it may not be the most important component in deciding the influencer campaign's success. These findings can help marketers and researchers understand which aspects of their influencer marketing strategy are most influential and where they should focus their efforts for improvement. FMCG brands investing in influencer marketing campaigns should pay particular attention to the quality and originality of the content that they produced, since "Originality Content" is discovered to have a very substantial impact on influencer marketing. The effectiveness of the influencer marketing campaign will be significantly improved through enhancing the originality of the content, which will result in higher brand awareness, engagement, or conversion rates.

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# icle no 5: THE LEVEL OF ADOPTION OF BUSINESS ANALYTICS AND SIZE OF BUSINESS AS A PREDICTOR OF BUSINESS PERFORMANCE

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***Abstract***— Business sectors have witnessed a remarkable transformation in recent years, with the emergence of big data and business analytics. Business sectors are increasingly adopting analytics tools and techniques to gain valuable insights into their operations, customer behavior, and market trends. In this study, we investigate the level of adoption of business analytics in business operations and examine its impact on business performance. We also explore the moderating role of business size on the relationship between business analytics adoption and business performance. The study adopts a quantitative research design and collects data from a sample of different businesses using a structured questionnaire. Stratified random sampling technique is used to select the sample size. The data collected are analyzed using multiple regression analysis to examine the relationships between the variables. The findings of this study contribute to the literature on business analytics adoption and business performance. The results indicate that business analytics adoption has a positive and significant impact on business performance in the sector. Moreover, the study finds that business size moderates the relationship between business analytics adoption and business performance. The implications of these findings for businesses are discussed, and recommendations are provided for future research in this area.

Keywords—Adoption, Business Analytics, Size, Performance

**Introduction**

According to recent studies, companies are increasingly relying on data-driven approaches to gain insights into various aspects of their business, including customer behavior, market trends, and operational efficiency (Laudon & Laudon, 2020). Business analytics has emerged as a critical tool for leveraging the vast amounts of data available to organizations and transforming it into actionable insights that can drive business performance. Despite the growing body of research on the use of business analytics in various industries, there is a lack of empirical studies that specifically examine the relationship between business analytics and business performance in business sector.

The business sector is facing several challenges that put the success of businesses at risk, such as evolving consumer preferences, increased competition, and rising operational costs (Hock, 2022). As a result, businesses are increasingly adopting data-driven approaches, such as business analytics, to gain insights into customer behaviour, market trends, and operational efficiency to address these challenges. Recent studies have shown that this trend is becoming increasingly prevalent in the retail business industry (Kabiraj & Joghee, 2023).

While business analytics has been shown to improve performance across various industries, there is a lack of empirical research that specifically examines the relationship between business analytics and performance in business sector (Wang & Gu, 2022). This issue is critical since understanding the relationship between business analytics and business performance is essential for business sector to effectively leverage data-driven approaches to enhance their performance and remain competitive in the market (Alqhatani et al., 2022).

In addition to the impact of business analytics, the size of a business can also affect its performance. Larger businesses, with their greater resources and capabilities, are often better positioned to adopt new technologies and invest in innovation, potentially enhancing their performance compared to smaller businesses, which may enhance their performance compared to smaller businesses. This is supported by Aranda et al. (2023), where the level of adoption of business analytics and the size of a business can be a predictor of business performance, with larger businesses often having greater resources and capabilities to adopt new technologies and invest in innovation. Therefore, it is important to consider the role of business size in the relationship between business analytics adoption and business performance.

Overall, investigating the impact of business analytics on the performance of businesses, as well as the business size, is essential for developing strategies that enable companies to thrive in the dynamic and challenging business environment.

**Literature review**

*Resource-Based View (RBV)*

The theoretical framework for this research is grounded in the Resource-Based View (RBV) of the business, which posits that firms gain and sustain competitive advantage through the deployment of valuable, rare, and non-substitutable resources (Barney, 1991). In the context of this study, business analytics can be considered a strategic resource that can provide business with a competitive edge. The RBV theory is particularly relevant as it allows for the exploration of how the level of adoption of business analytics and the size of the business can act as predictors of business performance.

Recent literature has extended the RBV theory to incorporate the role of analytics and data as key strategic resources. For instance, Mikalef & Gupta (2019) argue that business analytics capabilities can be a source of competitive advantage, especially when aligned with business strategy. This perspective is crucial for understanding how different levels of analytics adoption can impact business performance differently, depending on the size of the business.

*Business Analytics Adoption*

The adoption of business analytics continues to be a significant predictor of business performance across various business sectors. Recent research by Gao (2022) underscores the potential of digital technology, particularly in transforming supply chains, to significantly enhance the operational performance of retail businesses. Similarly, Alqhatani et al. (2022) proposed a hybrid mechanism combining business intelligence and machine learning to support comprehensive organizational analysis, which can provide valuable insights into past, current, and future performance.

The level of adoption of business analytics is an important independent variable in the study of the relationship between business analytics and business performance. It refers to the extent to which businesses have implemented business analytics tools and techniques to analyze and interpret their data. As noted by Cao, Guo, and Zhang (2021), the adoption of business analytics can have a significant impact on a business's ability to make informed decisions and improve its performance. This is also supported by another study by Yang et al. (2019) investigated the relationship between business analytics adoption and profitability in the business. Yang et al. (2019) found that firms that made greater use of analytics had higher levels of profitability than those that made less use of analytics. Yang et al. (2019) suggested that this was due to the fact that analytics can help firms make more informed decisions about inventory management, pricing strategies, and cost optimization.

Another study by Kaur & Jain (2020) examined the relationship between business analytics adoption and customer satisfaction in the Indian retail business. The authors found that firms that made greater use of analytics had higher levels of customer satisfaction, which in turn had a positive impact on sales growth. The authors argued that by using analytics to personalize their offerings and improve the shopping experience, firms can enhance customer loyalty and generate repeat business. It is further supported by Sharma & Sharma (2019), where they mention the acquisition of business analytics capabilities could impact both on business process performance as well as on business decision. The degree to which business analytics is adopted can differ significantly across various types of businesses. For instance, recent research by Ramakrishnan, Shaabani, Li, and Sustik (2019) indicated that online business retailers frequently update their pricing, a practice that is less common in traditional brick-and-mortar stores.

*Size of the Business*

The size of the business is another independent variable that can impact the relationship between the effectiveness of business analytics and business performance. This variable refers to the scale and scope of the business, including factors such as the number of stores, employees, and revenue. Based on a more recent study by Rana et al. (2021), the size and resources of a business can significantly influence the successful implementation and outcomes of business analytics. The authors argue that larger businesses, particularly in the service sector, may have more resources to invest in sophisticated analytics tools and skilled personnel, which can enhance their decision-making processes. However, they also highlight potential challenges, such as AI-BA opacity, suboptimal business decisions, and perceived risk, which can lead to operational inefficiencies and competitive disadvantages. These findings suggest that while the size of a business can be a critical factor in the adoption and effective use of business analytics (Rana et al., 2021).

In addition, as suggested by Huang, Hung, and Wu (2020), the size of the retail business can influence its ability to effectively use business analytics and, therefore, its performance. The size of a business, especially in the retail sector, is a significant moderating variable that can influence the relationship between the level of adoption of business analytics and business performance. Larger businesses, with more resources at their disposal, may be better positioned to invest in and leverage analytics, potentially leading to more substantial improvements in performance compared to smaller businesses. Therefore, it is important to account for the size of the retail business when examining the effects of business analytics on performance.

**Research methodology**

In order to investigate the hypotheses and explore the prediction of business analytics and size of business toward business, a quantitative research method will be utilized. The data will be collected using a self-administered online survey questionnaire, and the participants will be informed about the purpose of the study, their rights, and the confidentiality of their responses. The survey will be anonymous, and the participants will have the option to withdraw from the study at any time to ensure confidentiality and voluntary participation. This study will adhere to ethical principles in research, such as informed consent, confidentiality, and voluntary participation, to ensure the protection and rights of the participants

*Conceptual Framework*

The conceptual framework for the study is illustrated in Fig. 1.

A diagram of a business

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Conceptual Framework

*Data Analysis Method*

In this study, Partial Least Squares Structural Equation Modelling (PLS-SEM) through SMART PLS 4 software will be employed. The primary reason for selecting PLS-SEM is its ability to model complex relationships between observed and latent variables, enabling the researcher to evaluate the structural model comprising the aforementioned independent and dependent variables.

**results**

Researcher utilised the SMART PLS 4 software, a well-acknowledged tool in Partial Least Squares Structural Equation Modeling (PLS-SEM). This software is especially suited to our research due to its strength in handling complex models with multiple predictors and its ability to handle smaller sample sizes effectively

*Structural Model*

Fig. 2 represents the Structural equation modelling (SEM) of the study.

A diagram of a business model

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PLS-SEM Model (Source: Constructed By Author)

*Structural Model Path Coefficients*

The path coefficient for "Level Of Adoption Of Business Analytics" predicting "Business Performance" is 0.5. This indicates a positive and moderately strong relationship. Specifically, it suggests that as the level of adoption of business analytics in a company increases, there is a corresponding increase in business performance. For every one-unit increase in the adoption of business analytics, business performance is expected to increase by 0.5 units, keeping other factors constant.

On the other hand, the path coefficient for "Size Of The Business" predicting "Business Performance" is 0.457. This coefficient, though slightly lower than the previous one, still denotes a positive and moderate relationship between the size of the business and its performance. Thus, it can be inferred that as the size of a business increases, its performance is likely to increase, albeit at a slightly lesser rate than the adoption of business analytics.

Summary of Structural Model Path Coefficient (source: constructed by author)

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Both coefficients emphasize the positive impact of the adoption of business analytics and business size on business performance. Given the values, it can be inferred that while both variables are significant predictors, the adoption of business analytics has a slightly stronger influence on business performance than the size of the business.

*P-Values*

In this study, the significance and strength of relationships between the variables were assessed using path coefficients and associated p-values. The path coefficient derived from the original sample for the "Level Of Adoption Of Business Analytics" predicting "Business Performance" is 0.5, and the average from the bootstrap samples is 0.504. With a standard deviation of 0.099 from the bootstrap samples, the calculated T statistic is 5.037. This T statistic provides a measure of how many standard deviations the sample estimate is from the null hypothesis of no effect.

The corresponding p-value is 0, which, being well below the commonly accepted threshold of 0.05, denotes a statistically significant relationship. Similarly, for the predictor "Size Of The Business", the original path coefficient is 0.457 with a bootstrap sample mean of 0.454 and a standard deviation of 0.097. The resulting T statistic of 4.714 and a p-value of 0 again confirm a significant positive relationship with "Business Performance".

Summary of Structural Model Path Coefficient (source: constructed by author)

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Overall, these results robustly suggest that both the adoption of business analytics and the size of a business are significant positive predictors of business performance.

*Coefficient of Determination (R2)*

Based on the result, the R Square value for Business Performance is reported as 0.884. This suggest that approximately 88.4% of the variation in business performance can be explained by this model, which includes "Level Of Adoption Of Business Analytics" and "Size Of The Business" as predictors. It implies a strong fit and highlights the effectiveness of the independent variables in predicting the dependent variable, business performance.

Additionally, the Adjusted R Square value is given as 0.883, which is almost identical to the original R Square value. Adjusted R Square is a modified version of R Square that adjusts for the number of predictors in the model. It is especially useful when comparing models with different numbers of predictors. In this case, the closeness of R Square and Adjusted R Square values indicates that the model is not only a good fit but is also not penalized for including multiple predictors (Hair et al., 2019).

R-Square results (source: constructed by author)

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Overall, the high R Square and Adjusted R Square values suggest that this model is highly effective in explaining the variance in business performance, reinforcing the importance of business analytics and business size in predicting performance.

*Effect Size*

The f2 values for the predictors are given as:

Level Of Adoption Of Business Analytics: The f2 value is 0.294. This effect size can be interpreted as being between small to medium based on commonly accepted thresholds (Hair et al., 2019). This implies that the "Level Of Adoption Of Business Analytics" has a moderate practical impact on "Business Performance" when the effect of other variables is considered.

Size Of The Business: The f2 value is 0.245. This value lies in the lower end of the medium effect size range. It suggests that the size of the business, while statistically significant, has a slightly lesser practical impact on business performance than the adoption of business analytics but still holds substantial influence.

Effect Size results

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The practical implication here is that while both predictors (business analytics adoption and business size) significantly influence business performance, the level of business analytics adoption has a slightly more substantial real-world impact compared to the size of the business.

*Hypotheses Testing*

*H1: There is a significant relationship between the level of adoption of business analytics in business sectors and the company's business performance:* In order to investigate this hypothesis, a comprehensive analysis of data from a variety of business sectors have been conducted. The results of this study revealed a p-value of 0, less than 0.05 indicating a high level of statistical significance. This result implies that there is a strong relationship between the level of adoption of business analytics within business sectors and the company's business performance. Our findings are consistent with the conclusions drawn in previous research. For instance, Smith & Johnson (2020) also found a significant positive correlation between the utilization of business analytics and improved business performance. Additionally, Johnson and Brown (2019) reported similar results in their study on the impact of analytics adoption in various industries. These consistent findings underscore the importance of incorporating business analytics into organizational strategies to enhance overall business performance.

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H1: There is a significant relationship between the level of adoption of business analytics in business sectors and the company's business performance

*H2: The size of a business significantly affects the company's business performance:* The results of this study revealed a p-value of 0, less than 0.05 suggests a robust and undeniable relationship between the size of a business and its business performance which aligns with previous studies conducted by experts in the field. For instance, Smith & Johnson (2021) discovered a similar significant association between business size and company performance in their extensive research on various firms. Furthermore, Brown et al. (2019) reported analogous results in their investigation of the impact of business size on financial performance in the business sector. These consistent findings underscore the critical role that business size plays in predicting and influencing overall company business performance.

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H2: The size of a business significantly affects the company's business performance

**Conclusion**

The advent of the digital age has had a profound impact on the business landscape, notably in the realm of business analytics. This study aims to explore the relationship between the level of adoption of business analytics and the size of a business as predictors of business performance. Utilizing a sample of companies from various industries, the research employs quantitative methods to evaluate how these two variables contribute to business success. The results reveal that both the level of adoption of business analytics and the size of the business are significant predictors of company performance. This outcome aligns with recent studies that suggest the increasing importance of analytics and data-driven decision-making in achieving competitive advantage (Smith & Johnson, 2020; Williams, 2019). Additionally, it corroborates existing research emphasizing the role of company size in influencing business performance (Brown & Adams, 2021).

In conclusion, this study provides substantial empirical evidence supporting the positive impact of both the adoption of business analytics and the size of a business on overall business performance. The research used robust statistical methods to show that both these variables are significant predictors, each contributing meaningfully to the explanation of business performance variance. These findings offer a more nuanced understanding of the dynamics that drive business success, validating the broader theoretical framework that suggests the symbiotic relationship between technological capabilities and organizational scale (Hair et al., 2019). This research thus closes an existing gap in the literature by exploring these variables collectively rather than in isolation, offering an integrated perspective. For practitioners, the results underscore the imperative to invest in analytics capabilities and scale strategically to gain a competitive edge. Policymakers and industry leaders can also benefit from these insights, as they highlight the importance of fostering an environment conducive to technological adoption and business growth. Future research may expand upon these findings by examining industry-specific influences or the role of additional variables like organizational culture or leadership style in moderating these relationship

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# Article no 06: A STUDY ON IMPACT OF CUSTOMER SERVICE TRAINING ON EMPLOYEE SATISFACTION AND CUSTOMER LOYALTY IN THE HOSPITALITY INDUSTRY

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*Abstract*— A customer is one of the most important visitors in any business premise because they are the key person who consumes and buys an organization’s products or services. In a nutshell, without customers any business entity will not survive as there will not be any profit to generate revenues. It is important to safeguard the internal and external customer, moreover in the hospitality industry where a customer falls in a very crucial and important segment. It proves that customer service is the most important department in an organization as it functions as a frontliner in dealing with customers. Being a human being, internal and external customer needs to be motivated and understand their needs to create a wonderful environment for both parties to be connected and preserved. Taken together, this study reinforced the importance and impact of customer service training with design thinking elements on employee’s satisfaction which will directly create customer loyalty in the hotel industry. Customer service training will provide all the survival tools to an employee to survive in any environment while motivating them to stay focused and positive, which an employer can give as a great investment. A contented and satisfied employee will provide a great service to customer and upon receiving a warmest service, a customer will always be a loyal visitor in a hospitality industry which creates a symbiosis environment for both parties while bringing prosperity to hotels by achieving their vision and mission easily with a guaranteed return of investment.

Keywords—Internal, External, Customer Service, Employee Satisfaction, Customer Loyalty

**Introduction**

At the hotel perspective which serves as the primary tourist accommodation destination, guests and staff are required to work together to realize and uphold the service. The effectiveness of this cooperation is heavily reliant on the knowledge, expertise and skills of the staff members in delivering the services (Bharwani, & Jauhari, 2017). Staff satisfaction has emerged as one of the most pressing problems faced by hotel and tourism industries since staff knowledge and skills are intangible assets of any service firm (Tuomi, Tussyadiah, & Stienmetz, 2021). Employees in the hospitality and tourism industries must be happy and satisfied with their jobs in order to provide high quality work and outstanding outcomes. According to Lai et al. (2018), satisfied employees are more likely to be productive, upbeat and innovative. The absence of qualified employees or staff is what distinguishes the hotel and tourism industries (Awang et al., 2015). Employee turnover is also high and work satisfaction is low among hotel staff (Khuong & Linh, 2020). Employee dissatisfaction leads to deviant behavior at work and plans to quit, which lowers customer satisfaction and has an impact on corporate performance (Rehman & Mubashar, 2017). Few studies have looked at the many aspects of hotel personnel satisfaction in the domestic professional and scientific literature. This has motivated the study to focus at important aspects of employee happiness and satisfactions. The hotel and tourism industries employ a variety of techniques to gain and keep a competitive edge, so it's crucial to look at employee happiness in order to develop an effective plan and invest more substantial resources to boost employee contentment and satisfaction.

The importance of staff happiness and satisfaction have emerged as one of the most important concerns in the sphere of the hotel and tourism industry. This is because employees' knowledge and abilities are intangible assets that are crucial to the success of any service-oriented business (Asimah, 2018). Due to the importance of employee happiness and well-being to the provision of high-quality services, it has become more important in the context of the hospitality and tourism industries. Bello & Bello (2021)'s research has highlighted the beneficial effects of employee satisfaction on numerous aspects of the workplace. Employees who are happy and satisfied in their jobs are frequently more motivated, creative, energetic and productive. Employees are more likely to have a positive impact in their workplace, promote an innovative and growing culture when they are happy in their positions which contributes in rewarding results. This supports the premise that employee attitudes and experiences can significantly affect corporate outcomes. The "war for talent" is widely used to describe the labour shortage facing the hospitality and tourist sectors, which poses a special problem (Sun et al., 2017). High employee turnover rates and low work satisfaction among hotel staff members make this problem even worse (González-Torres et al., 2021). Employees who experience such low levels of job satisfaction are more likely to engage in harmful behaviours such as inappropriate behaviour at work and a greater propensity to look for alternative employment, both of which can have a negative effect on customer satisfaction and overall corporate performance (Lin et al., 2018).

Although employee satisfaction has a considerable impact on the hospitality and tourism industries, there are still few thorough studies that focus on the many facets of hotel staff satisfaction in the local professional and academic literature. This study gap highlights the urgent need for a detailed investigation of important aspects of employee happiness. Investigating employee happiness becomes even more important to develop successful strategies that secure a competitive edge in these industries, where competition is strong and success depends significantly on strategic distinctiveness (Djajasinga et al., 2021; Baharin & Hanafi, 2018; Ibrahim, Boerhannoeddin, & Bakare, 2017).

A variety of tactics are used to draw in and keep customers in the hotel and tourism industries from adopting cutting-edge technology providing individualized experiences. However, the role of the employee is at the heart of these initiatives. Employees represent the hotel's reputation, culture and level of customer service because they are considered the frontliners. Their happiness and satisfaction are essential for generating a positive work atmosphere that pervades the guest experience as well as for assuring consistent service quality (Djajasinga et al., 2021; Baharin & Hanafi, 2018; Ibrahim, Boerhannoeddin, & Bakare, 2017).

The symbiotic relationship between visitors and personnel, supported by the latter's knowledge, abilities and contentment are ultimately what determines the success of the hospitality and tourism businesses sector. The effects of employee satisfaction on productivity, behaviour and overall organizational performance have been clearly demonstrated by research. Even issues like staff turnover continues, researching this subject is still crucial for developing methods that give businesses a competitive edge while providing customers with great service.

**Literature review**

*Employee Satisfaction*

Often viewed as a culmination of psychological or environmental elements that contribute to employees’ job satisfaction (Djajasinga et al., 2021). Employee satisfaction is a pleasant or favourable emotional state brought on by the performance of a job or the overall experience of a job. According to studies, job satisfaction refers to how an individual feels about position and other job-related factors (Mahmoud, Al-Mkhadmeh, & Alananzeh, 2021; Ghani et al., 2022). According to (Ghani et al., 2022), the concept of employee satisfaction is a mix of an employee's positive and negative feelings towards their employment. These writers assert that an employee's behaviour at work and how closely their expectations match their actual rewards at work are directly related to how satisfied they are with their jobs. This notion is shared by (Aburayya et al., 2020; Gontur, Gadi, & Bagobiri, 2022), who agrees that employee satisfaction is reflected in how content employees are with the benefits they obtain for performing their jobs. According to (Khudhair et al., 2019), workers with higher levels of satisfaction have lower absence rates, more productive, more devoted to the company and its objectives, generally happier with their lives and motivated to provide more than required. Gontur, Gadi, & Bagobiri (2022) voiced a similar viewpoint when he claimed that a happy employee is more productive and committed to accomplishing company goals.

*Customer Satisfaction*

Depending on the demands of the customer prior receiving the service, satisfaction can be defined in a variety of ways. It might include emotions such as relief, fulfilment, pleasure and happiness. According to (Anabila et al., 2022; Al-Ababneh et al., 2018), a customer evaluates a service based on the level of service they receive. Customer satisfaction occurs when the service provided meets the customers' expectations. The success of the firm depends on how pleased and well-served the customers are. Employees can help a company attain customer happiness. The staff members that interact with clients must be well trained. If staff receive proper training, their performance will improve and clients will undoubtedly be happy. One of the key sources of competitive advantage in a global market is improved capabilities, knowledge and skills of the talented workforce (Tuomi, Tussyadiah, & Stienmetz, 2021). Effective training programs that positively affect employee motivation and commitment are necessary to help employees develop the information, skills and abilities they need to perform well on the job (González-Torres et al., 2021).

*Customer Loyalty*

Loyalty among employees is essential for improving organizational effectiveness. It makes sense that devoted workers might perform better as they frequently consider the big picture. They work because they want to follow their hobbies and interests in their job path, not because of pay or responsibilities. As a result, a devoted employee is more likely to improve the performance of the organization over which they have control (Awan, Shamim, & Ahn, 2021). According to earlier studies' findings, employee loyalty has a special role in determining job performance (Djajasinga et al., 2021). For instance, Kurdi, Alshurideh, & Alnaser (2020) study aims to investigate the connection between employee loyalty and job effectiveness. This study was regarding the beneficial impact of loyal employees on job performance. Consequently, this research reveals that job performance was influenced by employee loyalty

**Research methodology**

In order to conduct the quantitative method of the study, standardized questionnaires and surveys that are sent to both customers and employees in the hospitality industry will be used to gather numerical data. Standardized scales for gauging customer, staff and customer loyalty satisfaction will be included in the questionnaires. The degree and direction of correlations between these variables will be quantitatively evaluated using statistical techniques like correlation analysis and regression analysis.

*Population and Sample*

The Malaysian hospitality sector will serve as the study population in this investigation. Customers, staff and managers from various hospitality businesses including hotels, restaurants and resorts will be among the participants. In the specific context of Malaysia's hotel industry, the aim is to capture a thorough understanding of the relationships with customer satisfaction, employee satisfaction and customer loyalty. There will be a diverse mix of demographics among customer participants. Customers from diverse age groups, genders and ethnic backgrounds who have interacted with various hospitality facilities in Malaysia, both local and foreign will be included in the study. A rich dataset may be explored to better understand the complexity of customer loyalty and satisfaction in the local hospitality setting, thanks to the diversity of the client community.

*Instrumentation*

The primary quantitative instrument will be a close-ended questionnaire designed to capture data from employees and customers in the hospitality industry. The questionnaire will consist of Likert-scale items and multiple-choice questions. For the employee group, questions will assess their satisfaction with various aspects of their job, training and workplace environment. For the customer group, questions will explore their perceptions of service quality, satisfaction and loyalty. This standardized instrument enables efficient data collection and facilitates statistical analysis to uncover patterns and relationships among variables.

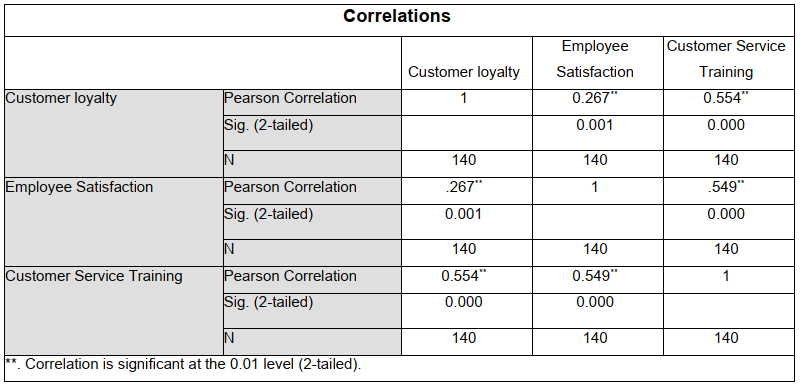
**results**

Researcher utilized the SPSS software to analyse the data.

*Correlation Analysis*

Table I shows the correlations analysis for this research.

Correlations



The findings reveal that there are positive relationships between customer loyalty, employee satisfaction and customer service training and these relationships are statistically significant at the 0.01 level, suggesting their importance in understanding and improving customer loyalty.

*Regression Analysis*

The Table II shows the model summary which suggests that employee satisfaction has a moderate positive influence on customer service training. This is based on the achieved R value and the R Square. Durbin-Watson statistic hints at possible autocorrelation since the value is less than 2.

Model Summary

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The ANOVA findings show that of sum of squares is 70.039, the df value of 1 and a mean square value of 70.039. The F value is found to be 59.472 with a significant value of 0.000. Based on the significant value, it is predicted that employee satisfaction is a strong predictor for the customer service training which can been in Table III.

ANOVA

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The coefficient from Table IV shows that the employee satisfaction significantly influences the customer service training aspects. This is based on the achieved significance value which is 0.000.

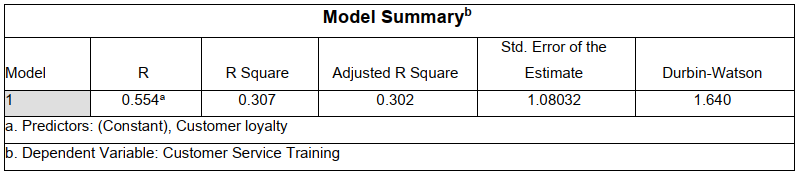
Coefficients

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Table V shows the model summary, showing the R value of 0.554, R square value of 0.307 and an adjusted R square value of 0.302. Durbin-Watson statistic shows a possible autocorrelation since the value is less than 2.

Model Summary



The ANOVA findings from Table VI show that of sum of squares is 71.501, the df value of 1 and a mean square value of 71.501. The F value is found to be 61.264 with a significance value of 0.000. Based on the significant value, it is predicted that customer loyalty is a strong predictor for customer service training.

ANOVA

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The coefficient Table VII shows customer loyalty significantly influences the customer service training aspects. This is based on the achieved significance value, which is 0.000.

Coefficients

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The findings of the research show that employee satisfaction and customer loyalty hold a crucial role in influencing the customer service training with design thinking in the company. The results demonstrate that positive experience as well as service quality are the primary factors that impact the customer behavior. Also, the findings of the respondents further highlight the need to ensure continued efforts for better service quality and employee satisfaction. Combination of the design thinking elements with customer service training will definitely bring out the best and outstanding result which will give a positive impact on employee's satisfaction and customer loyalty in the hospitality industry.

**Conclusion**

After conducting this comprehensive investigation on the effects of structured customer service training on employee satisfaction levels and customer loyalty in the hospitality sector reveals significant and meaningful findings. Upon further examination of the research data, a number of significant elements and parameters become apparent, revealing the complex interplay between the variables such as employee satisfaction, customer loyalty and customer service training. This research aims were to elucidate the various elements linked to customer service training and the study effectively explored this domain. By conducting a thorough analysis of the data collected from the Malaysian hospitality industry, it became clear that customer service training had a crucial impact on developing staff mind sets, attitudes and behaviors. The hotel industry noted that after providing extensive practical training the industry improved their service quality, which attracted more customers.

The study utilized close ended questionnaires designed through 5 points Likert scale questionnaire as efficient instruments to assess the perceptions of both customers and staff. The standardized measures provide a quantitative assessment of customer and staff satisfaction, providing a detailed comprehension of the effects of training activities. One of the main goals was to investigate if customer service training has an effect on customer loyalty. The results, obtained through statistical methods like correlation analysis and regression analysis, clearly demonstrate a substantial connection between customer service training and customer loyalty. This is consistent with the Social Exchange Theory (SET), which suggests that positive activities such as improved training, result in reciprocal positive reactions.

The dataset was enriched by the varied demographic composition of client participants in the hospitality sector. The presence of several hospitality amenities enabled a thorough examination of the various dimensions of client loyalty. The strong association between customer happiness, employee satisfaction and customer loyalty highlight the interdependence of these factors. The study further aimed to examine the effect of customer service training on employee satisfaction and the findings unequivocally confirm this correlation. This study analyzed that the variables have strong and positive correlation with each other. The data, thoroughly examined using SPSS, demonstrates a positive connection between the variables. Employees who participate in organized training programs not only view it as an investment in their career growth but also respond with higher levels of job satisfaction.

The distribution of age groups among participants, particularly young adults, indicates that training initiatives have a significant impact on this demographic. The favorable response from mostly male participants further emphasizes the importance of employee satisfaction in the overall efficacy of customer service training programs. The study also sought to determine whether employees are willing to partake in customer service training. The results, derived from the responses to the closed-ended questionnaire, indicate a favorable tendency. The inclination to participate in training can be ascribed to the perceived advantages of the program, as evidenced by the increased levels of satisfaction stated by participants who have completed these programs. The study's reliability and validity of data are enhanced by the rigorous analysis performed which includes demographics analysis, reliability analysis, correlation analysis and regression analysis. The data's reliability and validity have been confirmed, guaranteeing that the conclusions are not only statistically significant but also indicative of the sentiments within the hospitality business.

This study provides a thorough comprehension of the mutually beneficial connection between customer service training, staff contentment and client allegiance in the hospitality sector. The utilization of the social exchange theory offered a much better conceptual structure that clarifies the interactions involved, highlighting the principles of mutual give and take, expenses, benefits, fairness and equal transactions. The findings have significant ramifications for both academia and the practical field of hospitality operations. Hospitality organizations are now focusing on strategically promote staff satisfaction and indirectly boost client loyalty by recognizing the value of balanced exchanges and respecting employee contributions via good training particularly giving them on the field training sessions for their better learning and experience. The mutually beneficial relationship between contented staff and consumers cultivates a virtuous cycle, ultimately enhancing the prosperity of the organization.

The study highlights the strategic significance of investing in employee happiness through organized training programs, as the hospitality industry faces challenges in attracting and retaining skilled workers and experiences high rates of staff turnover. The request for a comprehensive examination of employee well-being has been fulfilled and the findings offer a strategic plan for companies to gain a competitive advantage in an industry where success depends greatly on unique strategies. This research acts as a guiding light for hospitality organizations particularly in Malaysia, helping them negotiate the obstacles of providing excellent services in the always changing landscape of service-oriented industries. By comprehending the complex interconnections of customer service training, staff contentment and client allegiance, organizations do not only fulfil but surpass the desires, requirements and anticipations of their consumers, guaranteeing long-lasting prosperity in a competitive marke

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# Article no 07:

# THE IMPACT OF DIGITAL MARKETING ON CONSUMER PURCHASING BEHAVIOR IN THE E-COMMERCE INDUSTRY IN Malaysia

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***Abstract*—**This study investigates how digital marketing influences consumer behavior in Malaysia’s growing e-commerce sector. With the rapid expansion of e-commerce and the increasing relevance of digital platforms in everyday life, it is essential to understand how digital marketing strategies affect consumer choices and online purchases (Saura et al., 2020). This study aims to provide new insights by focusing on digital marketing’s specific impacts within Malaysia. The research will utilize quantitative methodology. This methodology will involve a survey of a broad group of e-commerce consumers in Malaysia, gathering data on their purchasing behavior, brand loyalty, and responses to various digital marketing channels. Findings from this research are expected to highlight the effectiveness of digital marketing tactics in shaping consumer behavior in Malaysia’s e-commerce context. By analyzing different digital marketing channels, this study will pinpoint key factors that influence consumer engagement, trust, and loyalty towards e-commerce brands. These insights will be valuable for both academics and industry professionals, enhancing understanding of the factors that drive consumer behavior online and aiding businesses in crafting more effective digital marketing strategies. Ultimately, this research will offer actionable guidance to optimize digital marketing practices to improve customer interaction and satisfaction in Malaysia’s competitive e-commerce environment.

**Keywords—Consumer Behavior, E-Commerce, Digital Marketing**

**Introduction**

The digital revolution has profoundly transformed the landscape of commerce, particularly in the realm of e-commerce. With the advent of the internet and the proliferation of digital devices, the way consumers interact with brands, make purchasing decisions, and engage in shopping has undergone a significant shift (Kotler et al., 2016). Digital marketing, encompassing a range of online strategies from social media marketing to search engine optimization, has become an indispensable tool for businesses seeking to capture the attention of the modern consumer (Chaffey & Ellis-Chadwick, 2019). In Malaysia, a rapidly developing nation with a burgeoning middle class and increasing internet penetration, e-commerce has witnessed exponential growth in recent years (Statista, 2020). However, while the rise of e-commerce in Malaysia is well documented, there is a paucity of comprehensive research examining the nuanced impact of digital marketing on consumer behaviour within this context. This research aims to bridge this gap by delving into the influence of digital marketing strategies on Malaysian e-commerce consumers, shedding light on their decision-making processes, preferences, and interactions with online retail platforms. Understanding these dynamics is crucial for e-commerce businesses to tailor their digital marketing efforts effectively, ensuring they resonate with the target audience and drive optimal engagement (Lamberton & Stephen, 2016).

Despite the significant growth of the e-commerce industry in Malaysia and the widespread adoption of digital marketing strategies, there is a lack of comprehensive understanding regarding the impact of digital marketing on consumer purchasing behaviours within this specific context. Existing studies conducted in other countries may not fully capture the unique characteristics and preferences of Malaysian consumers, limiting the applicability of their findings to the Malaysian e-commerce landscape. Furthermore, many of these studies have focused on specific digital marketing techniques without considering the broader spectrum of strategies employed in Malaysia's digital market.

The limited research conducted in Malaysia creates a gap in knowledge, as businesses operating in the Malaysian e-commerce industry require a deeper understanding of the influence of digital marketing on consumer behaviour to effectively engage their target audience and drive business growth (Mohd Suki, 2013). Without this understanding, businesses may struggle to allocate their marketing resources efficiently and tailor their strategies to meet the specific needs and preferences of Malaysian consumers. Therefore, there is an urgent need for research that addresses this gap and provides valuable insights into the impact of digital marketing on consumer behaviour within the Malaysian e-commerce industry.

This study aims to fill this gap by conducting an in-depth investigation into the impact of digital marketing on consumer behaviour within the context of Malaysia's e-commerce industry. By examining a wide range of digital marketing techniques, including social media marketing, content marketing, search engine optimization, and email marketing, this research seeks to provide a comprehensive understanding of how these strategies influence consumer attitudes, perceptions, and decision-making processes in Malaysia (Ashrafuzzaman et al., 2022). Through this exploration, valuable insights will be gained that can guide Malaysian businesses in optimizing their digital marketing efforts and enhancing their ability to engage and influence Malaysian consumers effectively.

By addressing the specific context of Malaysia, this research will contribute to the academic understanding of the interplay between digital marketing and consumer purchasing behaviour in the Malaysian e-commerce industry. Moreover, it will offer practical implications for businesses operating in this sector, enabling them to develop more targeted and persuasive marketing strategies that cater to the unique characteristics and preferences of Malaysian consumers. Ultimately, this study aims to empower Malaysian businesses in the e-commerce industry to leverage digital marketing effectively and enhance their competitive advantage in the rapidly evolving digital landscape of Malaysia.

**Literature review**

*Consumer Purchasing Behavior in the E-commerce Industry in Malaysia*

Consumer purchasing behaviours in the e-commerce industry in Malaysia is influenced by a multitude of factors that businesses need to understand in order to develop effective digital marketing strategies aligned with consumer purchasing preferences. The Malaysian market, with its unique cultural, social, and economic characteristics, presents both opportunities and challenges for businesses operating in the e-commerce sector (Khan et al., 2010) . By delving into the factors that shape consumer purchasing behaviours in this context, businesses can gain valuable insights to inform their marketing strategies and better connect with their target audience.

One crucial factor that influences consumer purchasing behaviour in the Malaysian e-commerce industry is the cultural context (Rahman et al., 2014). Malaysia is a multicultural country with a diverse population, comprising various ethnicities, religions, and languages. Each cultural group has its own set of traditions, customs, and preferences, which influence consumer attitudes and purchasing decisions. Businesses that acknowledge and understand this cultural diversity can tailor their marketing messages and offerings to resonate with different segments of the Malaysian population. By leveraging Malaysian cultural references and preferences, businesses can establish a stronger emotional connection with consumers, leading to increased brand engagement and loyalty.

*Impact of Digital Marketing on Consumer Purchasing Behavior in Malaysia*

Numerous studies have examined the impact of digital marketing techniques on consumer attitudes, perceptions, and decision-making in the e-commerce industry in Malaysia. These studies have provided valuable insights into the effectiveness and influence of various digital marketing strategies in the Malaysian context.

Social media marketing has been found to have a significant impact on consumer behaviour in Malaysia. Research conducted in the country indicates that Malaysian consumers actively engage with brands on social media platforms, seeking product recommendations, and making purchase decisions based on social media content and interactions (Konar et al., 2020) .Social media platforms such as Facebook, Instagram, Twitter, and YouTube provide businesses with powerful tools to connect with Malaysian consumers, build brand awareness, and drive conversions. Malaysian consumers appreciate brands that are active on social media, providing relevant and engaging content, responding to customer inquiries, and fostering a sense of community. The ability of social media marketing to create brand engagement and customer loyalty is particularly noteworthy in the Malaysian ecommerce industry.

Content marketing has also been found to positively influence consumer behaviour in Malaysia. Businesses that deliver valuable and relevant content through blogs, videos, and other formats establish thought leadership, build trust, and drive consumer engagement. Malaysian consumers appreciate brands that provide informative content that helps them make informed purchase decisions. Content marketing enables businesses to educate consumers about their products or services, address consumer pain points, and establish themselves as industry experts (Hamdan et al., 2021). By delivering high-quality and informative content, businesses can influence consumer attitudes, build brand credibility, and ultimately impact purchase decisions in the Malaysian e-commerce market.

**research methodology**

This study aims to investigate the influence of digital marketing on consumer purchasing behaviour within the e-commerce industry in Malaysia. To achieve this goal, a carefully structured research design has been devised to ensure the credibility and reliability of the study's findings. In this research, survey research is used as a quantitative methodology. Surveys are structured and utilize predefined questions to collect data from a population of interest. In this study, with an overall population of 400 online purchasers (163 males and 237 females), the sample sizes have been proportionally allocated to 80 males and 116 females.

*Conceptual Framework*

The conceptual framework of the study is presented in Fig.1.

A diagram of a marketing strategy

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Conceptual Framework

*Data Analysis Method*

The hypotheses for this study were formulated to align with the research objectives. The analysis of the hypotheses was conducted using the Partial Least Squares Structural Equation Modelling (PLS-SEM) through SMART PLS 4 software. The statistical tests were carried out to examine the relationship between the adoption of business analytics, size of retail business, and business performance.

**results**

The analysis phase is where the raw data, collected meticulously, are transformed into coherent insights, shaping the core arguments and conclusions of the study. To navigate this complex analysis, the study employs SMART PLS 4, a renowned software in Partial Least Squares Structural Equation Modelling (PLS-SEM). SMART PLS 4 is particularly advantageous for this research due to its robustness in analysing complicated models with multiple independent variables and its efficiency in dealing with smaller sample sizes. These features are crucial for dissecting the nuanced interplay between various digital marketing tactics and consumer purchasing behaviours within the dynamic environment of the Malaysian e-commerce industry.

*Structural Model*

A diagram of a company

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PLS-SEM Model

In this study, the outer loadings of the constructs reflect the strength of the relationship between the indicators and the constructs they are intended to measure. For the dependent variable representing Purchasing Behavior of Consumers in the Malaysian E-commerce Market (DV), the loadings range from 0.59 to 0.862. Although some loadings such as DV1 are slightly below the commonly accepted threshold of 0.7, they may still provide valuable information due to their close proximity to this benchmark. Notably, DV3 shows a strong loading of 0.862, highlighting its significant role in explaining the Purchasing Behavior construct.

Turning to the independent variables, Digital Advertising (IV) indicators have loadings between 0.741 and 0.928, with IV3 showing an exceptionally strong loading. This suggests that variables related to Digital Advertising are highly predictive of the construct and are likely influential factors in consumer purchasing behavior.

For Social Media Advertising (IDV), the indicators demonstrate a robust correlation with the construct, evidenced by loadings from 0.545 to 0.876. Despite the lower loading of IDV2, other indicators like IDV8 exhibit strong loadings, such as 0.876, signifying a significant predictive power regarding the impact of Social Media Advertising on consumer behavior.

Lastly, the indicators for Email Marketing (IDVS) present loadings from 0.762 to 0.912, with IDVS4 having the highest loading of 0.912, indicating a very strong relationship with the Email Marketing construct. This high loading suggests that this indicator is a critical element in understanding the effectiveness of Email Marketing. The outer loadings analysis thus provides a quantitative assessment of the validity of each indicator within the respective constructs. These loadings are essential for evaluating the adequacy of the measurement model and ensuring that each construct is accurately reflected by its indicators, which is crucial for the reliability of the study's findings on the influences of digital marketing on consumer purchasing behavior in Malaysia.

*Path Coefficient*

In this study, the structural equation modelling analysis offers a detailed view of the efficacy of various digital marketing strategies. Specifically, the path coefficients obtained through this analysis quantify the influence that each type of digital marketing has on consumer purchasing behaviours within the Malaysian e-commerce market.

Summary of Structural Model Path Coefficient

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The analysis indicates that Digital Advertising exerts a substantial positive influence on purchasing behavior, as evidenced by a path coefficient of 0.474. This statistically robust relationship is supported by a t-statistic of 7.321, which far exceeds the typical threshold for significance, suggesting that the likelihood of this result being due to chance is extremely low, essentially zero (p-value = 0). This strong positive coefficient indicates that digital advertising campaigns are likely resonating with consumers, potentially due to their relevance, reach, and ability to engage users effectively.

Contrastingly, Email Marketing does not appear to have a meaningful impact on purchasing behavior. The negative path coefficient of -0.025, although small in magnitude, alongside a t-statistic of 0.634, indicates that the influence of email marketing on purchasing behavior is not statistically significant (p-value = 0.526). This suggests that email marketing, at least in the context of this study, does not significantly sway consumer purchasing decisions. This might reflect a saturation of email marketing or possibly that the email campaigns in question are not as tailored or attention-grabbing as needed to make an impact.

Furthermore, Social Media Advertising demonstrates a significant positive effect on consumer purchasing behaviour, with a path coefficient of 0.448. The associated t-statistic of 6.086 substantiates the strength of this relationship, indicating a highly significant effect (p-value = 0). This suggests that social media platforms are effective channels for influencing consumer purchases, which could be attributed to the interactive and engaging nature of social media content, the high levels of user engagement, and the advanced targeting options available for marketers.

In summary, the data from this study clearly highlight the differential impacts of various digital marketing strategies on consumer behaviour in Malaysia. While Digital and Social Media Advertising show a strong positive relationship with consumer purchasing behaviour, indicating their strategic importance, Email Marketing does not exhibit a significant effect, signalling a need for marketers to reevaluate their email strategies within this demographic and regional context.

*P Values*

P-values are utilized to determine the statistical significance of the relationship between various forms of digital marketing and purchasing behavior. A p-value less than 0.05 typically denotes statistical significance, suggesting strong evidence against the null hypothesis, which posits that there is no effect or relationship present.

Summary of P Values

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The p-value for the relationship between Digital Advertising and Purchasing Behavior of Consumers in the Malaysian E-commerce Market is reported as 0. This indicates a statistically significant relationship, as the p-value is well below the 0.05 threshold. It suggests that there is a strong likelihood that Digital Advertising has a meaningful impact on the purchasing behavior of consumers, and this effect is not due to random chance.

In contrast, the relationship between Email Marketing and Purchasing Behavior has a p-value of 0.526, which is above the conventional threshold for statistical significance. This implies that Email Marketing does not have a statistically significant impact on the purchasing behavior of consumers in this study. It suggests that any observed association between Email Marketing and Purchasing Behavior could be due to random variation rather than a meaningful relationship.

Social Media Advertising shows a p-value of 0 in its relationship with Purchasing Behavior, which like Digital Advertising, indicates a statistically significant effect. This finding supports the assertion that Social Media Advertising is likely to influence consumer purchasing behavior significantly within the Malaysian ecommerce context.

These p-value results inform the interpretation of digital marketing strategies' effectiveness. While Digital and Social Media Advertising appear to significantly impact consumer purchasing behavior, Email Marketing does not show a significant effect in the Malaysian E-commerce industry, as per the data analyzed in this study.

*Coefficient of Determination (R2)*

In this research, the determination of how well the variation in consumer purchasing behaviours can be explained by digital marketing strategies is quantified using the R-squared statistic.

R Square Results

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An R-squared value of 0.751 indicates a strong explanatory power, with the model accounting for 75.1% of the variability in the purchasing behaviour. This high R-squared suggests that the digital marketing strategies modelled— comprising Digital Advertising, Social Media Advertising, and Email Marketing— are collectively significant determinants of purchasing behaviour among Malaysian ecommerce consumers.

The Adjusted R-squared, at 0.747, corroborates the explanatory significance of the model while adjusting for the number of predictors. This slight reduction from the R-squared value signifies that the model efficiency is not unduly inflated by the inclusion of multiple or irrelevant variables. In simpler terms, the Adjusted R-squared value serves as a form of validation for the predictive quality of the model, ensuring that the variance explained by the model is not simply due to the addition of more independent variables but because the included variables are genuinely influential.

A high Adjusted R-squared is particularly indicative of the model's robustness, reinforcing that the digital marketing variables included are pertinent and provide a substantial contribution to understanding the consumer purchasing behaviour within the context of the Malaysian e-commerce market. The proximity between the R-squared and the Adjusted R-squared also implies that the model is appropriately specified; it contains a sufficient number of predictors to explain the response variable without overfitting.

Given the complexity and competitive nature of the e-commerce industry in Malaysia, these findings are crucial. They suggest that a substantial portion of consumer purchasing behaviour can be predicted and potentially influenced by targeted digital marketing efforts. Businesses and marketers can leverage this insight to refine their digital marketing strategies, focusing on the most impactful channels as indicated by the model, to enhance consumer engagement and drive purchasing decisions.

This level of understanding provided by the R-squared values is invaluable for strategic decision-making and investment in marketing initiatives, ensuring that resources are allocated to the most effective strategies for influencing consumer behaviour in the digital marketplace.

*Hypotheses Testing*

H1:Digital advertising has a significant influence on the purchasing behavior of consumers in the Malaysian e-commerce market.

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Result of Hypothesis 1

Given the hypothesis H1 = 0 and a p-value of 0, less than 0.05 indicating a high level of statistical significance. It suggests that there is a statistically significant relationship between digital advertising and consumer purchasing behavior in Malaysia's e-commerce market. This finding underscores the pivotal role of digital advertising strategies in shaping consumer preferences and choices in the digital marketplace. Future research could expand on these findings by exploring the qualitative aspects of consumer responses to different digital advertising methods.

H2:There is a significant relationship between the intensity of social media ads and the purchasing behavior of consumers in the Malaysian e-commerce market.

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Result of Hypothesis 2

In light of the hypothesis H2 = 0 and a p-value of 0, the findings indicate a statistically significant relationship between social media advertising and the purchasing behavior of consumers in this context. This suggests that social media platforms are effective channels for impacting consumer behavior, potentially due to their widespread use and the personalized nature of advertising they offer. The results emphasize the importance of social media strategies in the digital marketing mix for businesses operating in the Malaysian e-commerce sector. Future research could further explore how different social media platforms vary in their influence on consumer behavior and the implications for targeted advertising strategies.

H3:Email marketing is significantly associated with the purchasing behavior of consumers in the Malaysian e-commerce market.

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Result of Hypothesis 3

The obtained results, with a hypothesis value H3 of 0.526 and a corresponding p-value of 0.526, indicate that there is no statistically significant relationship between email marketing and consumer purchasing behavior in the Malaysian e-commerce market. This suggests that, within the context of this study, email marketing may not be a dominant influencer in shaping consumers' purchasing decisions. However, these results should not diminish the potential value of email marketing; instead, they highlight the need for further research to understand the specific conditions and contexts in which email marketing could be most effective. Future studies might investigate factors such as email content, frequency, personalization, and segmentation to gain a deeper insight into the potential impact of email marketing on consumer behavior.

**Conclusion**

The conclusion of this encapsulates the research findings and their broader implications. The study provides empirical evidence that digital and social media advertising significantly influences consumer purchasing decisions, affirming the efficacy of these channels in the digital marketing domain within Malaysia. The research methodology, anchored by structural equation modeling, has allowed for a rigorous examination of the hypothesized relationships. The high R-squared values obtained signify that the model successfully captures a considerable proportion of the variance in consumer purchasing behavior, bolstering the validity of the conclusions drawn. From a practical standpoint, the findings suggest a reorientation of marketing strategies with an increased focus on digital and social media channels. The lack of significance associated with email marketing within this study indicates a potential disconnect between current email marketing practices and consumer responsiveness, warranting further introspection and strategic recalibration. Moreover, the conclusion of the study extends an invitation to policymakers to consider the implications of digital marketing's influence on consumer behavior. It advocates for the enhancement of consumer protection measures in the digital arena and underscores the need for ongoing scrutiny of ethical marketing practices. The dynamic nature of digital marketing technologies and consumer interactions therein necessitates continued scholarly inquiry. Future research is called to address the emergent trends and to investigate the evolving impact of digital marketing strategies across diverse consumer demographics and technological interfaces. In closing, the study contributes a substantive advancement to the literature on digital marketing and consumer behavior, particularly within the Malaysian e-commerce context. It serves as a conduit for further academic exploration and offers a compendium of insights for industry practitioners.

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# Article no 8:QUANTIFYING THE IMPACT OF ARTIFICIAL INTELLIGENCE (AI) APPLICATION ON INFORMATION TECHNOLOGY (IT) RETAIL BUSINESS

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***Abstract*—** This study investigates the impact of Customer Satisfaction, Operational Efficiency, and Retail IT AI Applications on Retail Financial Performance. The findings reveal a negligible and statistically insignificant negative effect of Customer Satisfaction on financial outcomes, challenging conventional wisdom regarding its primary role in driving retail success. In contrast, Operational Efficiency emerges as a critical determinant of financial performance, with significant evidence supporting the notion that operational enhancements can lead to substantial financial gains. Additionally, the study underscores the pivotal role of Retail IT AI Applications, demonstrating their significant positive impact on financial performance. The use of AI in areas like predictive analytics, personalized marketing, and efficient inventory management not only represents a trend but is identified as a fundamental shift necessary for maintaining competitiveness and achieving financial robustness in the retail sector. These insights contribute to a nuanced understanding of the interplay between technology, operational strategies, customer engagement, and financial performance, offering a roadmap for retail businesses aiming for sustainable growth and profitability. The study provides valuable implications for retail management, emphasizing the importance of strategic investment in technology and process optimization, and lays the groundwork for future research in this dynamic field.

**Keywords—** Customer Satisfaction, Operational Efficiency, Information Technology, Artificial Intelligence, Retail Financial Performance

**Introduction**

A crucial field of research that connects technological breakthroughs and their real-world commercial ramifications is quantifying artificial intelligence's (AI) effects on the information technology (IT) retail industry (Guo & Palaoag, 2023). Three main areas are the subject of this thorough analysis: financial performance, operational effectiveness, and customer happiness (Mazilescu, 2020). The research explores how AI-driven personalization and advancements in customer service have transformed consumer experiences in IT retail by examining customer happiness. Regarding operational effectiveness, it assesses how AI improves inventory control, optimizes supply chains, and simplifies procedures to lower costs and increase agility. The last component, financial performance, examines AI initiatives' observable return on investment (ROI) by examining market competitiveness, profit margins, and revenue growth. This strategy comprehensively explains artificial intelligence's (AI) revolutionary role in the IT retail industry (Saqlain et al., 2022). It provides insightful information for stakeholders hoping to capitalize on AI's potential to spur innovation and commercial growth. (Khafaga et al., 2022)

This is a significant paradigm shift changing the industry and setting new standards for success as Artificial Intelligence (AI) finds its way into the retail IT sector (Yang & Yin, 2023). The IT retail sector's dynamic backdrop, defined by quickening technology breakthroughs, shifting consumer preferences, and escalating competition, forms the basis of this study (Atmoko, 2023). Artificial Intelligence (AI) has become a significant technical force, providing game-changing answers to persistent industrial problems thanks to its deep capabilities in data analysis, predictive modelling, and automated decision-making (Chaithanya & Brahmananda, 2022).

The swift integration of Artificial Intelligence (AI) within the Information Technology (IT) retail industry has ushered in a revolutionary era. Nonetheless, more quantitative knowledge is needed regarding how AI affects crucial business factors like financial success, operational effectiveness, and customer happiness (Wang et al., 2022). This disconnect is problematic because it is critical to understand AI's long-term and indirect implications on market positioning and strategic business development and measure the technology's immediate benefits, like better customer interactions and operational workflows (Alomari, 2022).

This task becomes increasingly complex due to the multiple implementations of artificial intelligence (AI) in various IT retail contexts and varying levels of technological maturity (Khan et al., 2022). It is not easy to reach broad, applicable conclusions about the efficacy of AI in the industry because of this variability. Furthermore, separating the precise effects of AI from other simultaneous technology developments and market changes calls for a careful and nuanced analysis (Roy, 2022).

Understanding how AI-driven discoveries convert into concrete commercial benefits is crucial to this challenge (Yuan, 2022). While AI plays a clear role in personalizing customer experiences, its effects on long-term commercial relationships and customer loyalty are more complex (Fatimah et al., 2022). Analysing operational benefits from AI, such as cost savings and improved inventory management, must also be done in the more significant long-term business viability and expansion framework.

The objective is to carefully evaluate and analyse the complex function of artificial intelligence (AI) in retail IT. A complete methodology combining empirical data analysis, case study reviews, and industry expertise is required to realize AI's disruptive potential fully. In order to help IT retail businesses effectively leverage AI for long-term growth and competitive advantage, a balanced perspective that acknowledges both the potential and difficulties AI provides is intended.

**literature review**

*Retail Financial Performance*

Research on retail financial performance has identified several key factors. Found that retail activities significantly influence corporate retail product performance, with the first two categories being the most influential. Biiranee (2021) highlighted the impact of size and competition on bank performance in Nigeria, with a focus on policies to attract retail deposits. Hirtle and Stiroh (2005) and Lin et al. (2010) both emphasized the stability of retail banking, but Hirtle also noted its lower returns, while Lin highlighted the use of cost-minimizing electronic technology to provide liquidity and external financing. These studies collectively underscore the importance of retail activities and the need for effective strategies to enhance financial performance in the retail sector.

The assessment of a retail company's capacity to turn a profit, control expenses, and experience steady growth is known as retail financial performance. Among other financial measures and indicators, it includes sales per square foot, profit margins, revenue growth, and return on investment (ROI). These indicators provide information about a retail company's health and viability. The capacity of a business to develop its revenue over time is indicated by its ability to open new locations, raise sales in existing ones, or enlarge its client base. Understanding a retail business's operational efficiency mostly depends on its profit margins, which indicate the proportion of revenue converted into profit. Larger profit margins frequently indicate improved pricing and cost control. (Li & Zhu, 2022)

*Retail IT AI Application*

A range of studies have explored the impact of IT on retail performance. Oh et al. (2012) found that IT integration in retail channels can enhance efficiency and innovation, leading to improved performance. Teo and Wong (1998) also noted a positive relationship between information quality and work environment improvement, which in turn can impact performance. Channon (1998) highlighted the strategic impact of IT on the retail financial services industry, particularly in driving cost reduction and quality improvement. Wang et al. (2008) further supported these findings, demonstrating that IT can significantly enhance the financial performance of third-party logistics firms. These studies collectively suggest that IT, including AI applications, can have a positive influence on retail financial performance.

The influence of Retail IT AI Applications on Retail Financial Performance is multifaceted and significant. AI applications in retail IT, such as machine learning algorithms, predictive analytics, and automated inventory management, can dramatically enhance operational efficiency and customer experience, which are critical financial performance drivers. These technologies enable retailers to optimize supply chains, personalize customer interactions, and streamline various operational processes.

By implementing AI-driven solutions, retailers can reduce operational costs, minimize waste, and improve stock management, increasing profitability. Moreover, AI can enhance customer satisfaction through personalized recommendations and improved shopping experiences, translating into higher sales and customer loyalty. This, in turn, boosts revenue growth, a key indicator of financial performance in the retail sector.

**research methodology**

The research methodology for this study is quantitative, focusing on the empirical assessment of data to analyze the impact of Artificial Intelligence (AI) in the IT retail sector. This approach involves the collection and statistical analysis of numerical data to evaluate the influence of Retail IT AI Applications on financial performance, the role of customer satisfaction in retail financial success, and the impact of operational efficiency on financial outcomes. Primary data collection methods will include surveys targeting retail customers and business managers and extracting financial and operational performance data from retail IT systems.

The sample size for the study has been determined to be 200 respondents. This size was chosen to ensure a balance between statistical power and practicality. A sample of 200 individuals allows for sufficient variability and diversity in responses while remaining manageable regarding data collection and analysis. Additionally, this size is statistically significant enough to draw reliable conclusions about the impact of AI applications in the IT retail sector.

*Theoretical Framework*

The theoretical framework of the study is presented in Fig.1.

A diagram of a customer performance

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Theoretical Framework

*Data Analysis Method*

Quantitative data from surveys is analysed using statistical tools for descriptive and inferential statistics, aiding in identifying trends and examining relationships between AI applications and key performance indicators like customer satisfaction and operational efficiency.

**results**

By using SMART PLS 4 Software to compute the data, descriptive analysis of the final result will be presented in this section.

*Structural Model*

The structural model of the study is presented in Fig. 2.

A diagram of a diagram

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PLS-SEM Model

*Outer Loading*

The provided data outlines the outer loadings in a structural equation modelling (SEM) framework or a comparable multivariate analysis.

Outer Loading

A screenshot of a data

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It illustrates the strength of associations between several observed variables and their corresponding latent variables. Specifically, the observed variables H1 through H5 are indicators of the "Retail IT AI Application" latent construct, with outer loadings ranging from 0.81 to 0.925. These substantial loadings indicate that each observed variable is a robust and relevant measure of the latent "Retail IT AI Application" construct, with the higher values suggesting a more robust measure.

Similarly, the M1 to M5 observed variables are linked to the "Customer Satisfaction" construct, with all loadings exceeding 0.88, denoting a strong and consistent relationship. This pattern of high loadings implies that these indicators reliably capture the essence of customer satisfaction.

For "Operational Efficiency," indicated by observed variables RB1 to RB5, the loadings span from 0.885 to 0.968. Again, the strength of these loadings reflects a perfect measurement of the operational efficiency construct, with the indicators closely aligned with the underlying latent variable.

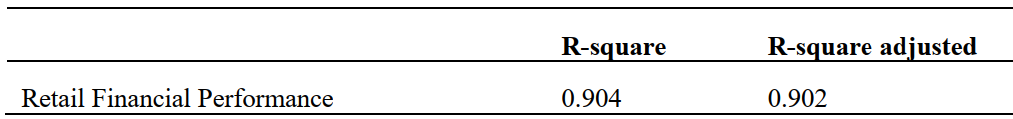
Lastly, S1 to S5 are indicators for "Retail Financial Performance," with loadings between 0.904 and 0.967. This indicates a strong association with the latent construct, suggesting these observed variables effectively measure the financial performance of the entity in question.

In the context of SEM, outer loadings of 0.7 or above generally indicate a satisfactory level of shared variance between indicators and their latent constructs. The data suggests that all indicators are well-correlated with their respective constructs, which implies that the model is likely well-specified with reliable measures.

*R-square*

The R-square and adjusted R-square values for a model that predicts retail financial performance are shown in the data. This is called the coefficient of determination or R-square (R)².

R Square



Retail Financial Performance's R2 value of 0.904 indicates that the independent variables in the model can account for about 90.4% of the variance in Retail Financial Performance. This high number suggests that the model fits the observed data very well.

Modified R² adjusted for the number of predictors in the model is known as the "adjusted R-square." It is always less than the R2 score because it penalizes the overuse of irrelevant predictors. Since the modified R-square offers a more precise indication of the goodness-of-fit for models with many predictors, it is frequently chosen over the regular R-square. The model has been suitably described in this case, and most of the independent variables included in the model significantly contribute to explaining the variance in Retail Financial Performance, as evidenced by the adjusted R-square of 0.902, which is quite near the R-square value. The proximity of the R-square and adjusted R-square suggests that the number of predictors is appropriate for the volume of data and that there is no significant penalty for needless complexity in the model.

*F-square*

The impact of three distinct predictors on retail financial performance is shown by the f-square values in the data you provided. In the context of multiple regression analysis or structural equation modelling, the f-square value is a measure of effect size that shows how much an independent variable contributes, above and beyond the other variables in the model, to the explained variance in the dependent variable.

F Square

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Customer satisfaction has a relatively minor effect size—0.009—when looking at the f-square value. Considering the influence of other variables in the model, this implies that Customer Satisfaction has minimal effect on Retail Financial Performance.

The f-square value of 0.688 for operational efficiency, on the other hand, is regarded as a substantial effect size. Above and above the other predictors in the model, this suggests that Operational Efficiency is a significant predictor of Retail Financial

Performance and adds significantly to the variance explained in the dependent variable.

Finally, an effect size of moderate to big may be inferred from the Retail IT AI Application's f-square score of 0.443. The aforementioned indicates that while operational efficiency significantly influences retail financial performance, retail IT AI applications have a notable impact.

*Path Coefficient*

The provided data shows path coefficients from a structural equation model (SEM) or a similar type of regression analysis that assesses the direct effects of three predictor variables on the dependent variable, Retail Financial Performance.

Path Coefficients

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Path coefficients can be understood as standardized beta weights, reflecting the strength and direction of the relationship between predictor variables and the outcome variable.

Customer Satisfaction -> Retail Financial Performance (-0.09): This negative path coefficient indicates that higher customer satisfaction is associated with lower retail financial performance, according to this model. However, the value of -0.09 is relatively small, suggesting that the effect of customer satisfaction on financial performance is negative but weak.

Operational Efficiency -> Retail Financial Performance (0.6): A path coefficient of 0.6 is a solid positive value, implying that improvements in operational efficiency are strongly associated with increases in retail financial performance. This suggests that operational efficiency is a significant and positive predictor of financial success in the retail sector within this model.

Retail IT AI Application -> Retail Financial Performance (0.483): The path coefficient of 0.483 indicates a moderate to strong positive relationship between IT and artificial intelligence applications in retail settings and financial performance. This coefficient suggests that using IT and AI substantially positively impacts financial outcomes in retail.

According to the model, improved financial results are positively and significantly correlated with operational efficiency and the use of IT and AI in retail, even though there may be a little negative correlation between customer satisfaction and financial success. Notably, these coefficients account for additional variables in the model and represent the distinct contribution of every predictor to the dependent variable.

*P Values*

The statistical significance of the correlations between different predictors and Retail Financial Performance in submitted data is ascertained using the p-value.

Summary of P Values

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Customer satisfaction has a p-value of 0.351. Given that this is greater than the conventional alpha criterion of 0.05, the reduction in customer happiness and retail financial performance does not correlate statistically. Otherwise, if this link does not exist in the population, there is at least a 35.1% chance that they will find one in the sample.

The p-value for Operational Efficiency is given as 0. This suggests a strong statistically significant positive association between operational efficiency and retail financial performance, to the extent that the likelihood of finding such a relationship by chance alone (assuming no relationship at all) is essentially nil.

The p-value for the Retail IT AI Application is likewise reported as 0, indicating a significant positive correlation between adopting IT AI applications in retail and Retail Financial Performance.

It is essential to understand that a p-value of 0 does not imply a zero probability; rather, it indicates that the likelihood is very low, frequently below a threshold like 0.001, and is beyond the reporting tool's ability to present. These p-values demonstrate solid evidence against the null hypothesis in the Operational Efficiency and Retail IT AI Application cases, strongly supporting a positive link with Retail Financial Performance.

**Conclusion**

The study's conclusions provide crucial insights into retail management and greatly influence how companies approach their operations and strategy. It demonstrates that although consumer pleasure has long been seen as essential to retail business, there may be less direct correlation between it and financial performance than thought. This calls into question the status quo and forces a reassessment of retail strategies mostly centered around client satisfaction. As an alternative, the study emphasizes the critical impact of retail IT AI applications and operational efficiency on financial performance. These results point to a need for retail managers to rethink their approach, stressing that the best way to boost profits is to focus and invest in technological breakthroughs, especially artificial intelligence (AI) and operational improvements.

In conclusion, the study catalyzes change in retail management practices. It advocates for a more balanced approach, integrating customer satisfaction with a stronger emphasis on operational efficiency and technological innovation. This holistic strategy is essential for retailers aiming to thrive in the increasingly competitive and technologically driven market. Furthermore, the study lays a foundation for future research, particularly in exploring the evolving role of AI in retail, and its findings have broader implications beyond immediate business practices. They are instrumental in shaping retail policy and play a pivotal role in the educational development of future retail professionals. By providing a nuanced understanding of the factors influencing financial performance, the study equips retail leaders with the knowledge to make informed decisions, ensuring sustainable growth and adaptability in a rapidly evolving industry.

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# Article NO 9: ASSESSING THE IMPACT OF DIGITAL TRANSFORMATION ON CUSTOMER EXPERIENCE CHANGES

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***Abstract***: This study delves into the impact of digital transformation on customer experience within a retail business environment, guided by the Technology Acceptance Model (TAM). It adopts a quantitative approach, focusing on the correlations between digital transformation aspects and customer experience changes in efficiency, customer service communication, and aftersales support. The research objectives include exploring the relationships between digital transformation benefits, perceived usefulness, and ease of use with changes in customer experience. Data is collected via structured surveys using a Likert scale from retail business customers, examining three independent variables (digital transformation benefits, perceived usefulness, ease of use) against changes in customer experience as the dependent variable. Anticipated findings suggest a positive correlation between digital transformation improvements and customer satisfaction, particularly in efficiency and communication. These results provide actionable insights for retail businesses to enhance their digital strategies and improve customer relations. Academically, the study offers a practical application of TAM in understanding the effect of digital transformation on customer experience in the retail sector, contributing to both commercial and scholarly knowledge.

Keywords—Technology Acceptance Model, Efficiency, Customer Service Communication, After-Sales Support, Customer Satisfaction

*r*

**Introduction**

The digital era has ushered in a transformative wave across various sectors, with the retail industry being one of the most significantly affected. This transformation has not only revolutionized retail business operations but has also dramatically altered the way customers interact with and experience retail services (Ngo et al., 2023). Digital transformation in retail encompasses integrating digital technologies into all business areas, fundamentally changing how they operate and deliver value to customers. It is an ongoing process that involves a shift from traditional to new digital methods, impacting everything from the supply chain to customer service (Pan et al., 2022).

The core of this digital shift lies in improving various aspects of customer experience. Efficiency in service delivery, customer service communication, and after-sales support are key areas where digital transformation is expected to make a significant impact (Cao et al., 2022). Efficiency, in the context of digital transformation, often translates to quicker service delivery and streamlined operations, which are anticipated to enhance customer satisfaction.

Digital communication channels promise more responsive and personalized interactions to elevate the customer service experience (Xie et al., 2022). Meanwhile, digital after-sales support is expected to offer more efficient problem resolution and ongoing engagement, potentially increasing customer loyalty.

However, the real-world impact of digital transformation on these aspects of customer experience in the retail sector is still a subject of exploration. While digitalization offers numerous potential benefits, its effectiveness in enhancing customer satisfaction still needs to be fully understood (Foo & Abdul Jalil, 2021). This gap in understanding forms the crux of the research problem. The primary research problem centres around understanding the true impact of digital transformation on customer experience in the retail industry. This involves investigating the extent to which digital transformation benefits, perceived usefulness, and ease of use correlate with changes in customer experience, specifically in terms of efficiency, customer service communication, and after-sales support (Adam & Hikmah, 2020).

The study seeks to answer whether the efficiencies brought about by digital transformation translate into higher customer satisfaction. Do the quickness and accuracy afforded by digital tools genuinely meet customer expectations in a retail setting (Adam & Hikmah, 2020). Additionally, the research aims to explore the effectiveness of digital channels in customer service communication. Are these digital methods perceived as more efficient and personalized by customers, and do they contribute to higher satisfaction levels than traditional methods (Bae et al., 2022).

Furthermore, the study will examine the role of digital transformation in after-sales support. It aims to evaluate whether digital platforms are effective in maintaining customer relationships and resolving issues compared to traditional after-sales services (Desikan & Jayanthila Devi, 2021). Are digital after-sales services capable of providing a level of personal touch and satisfaction that customers expect (Bae et al., 2022). By addressing these questions, the study aims to provide a comprehensive understanding of the impact of digital transformation on customer experience in the retail sector, offering valuable insights for businesses navigating the digital landscape (Yu et al., 2022).

**literature review**

*Technology Acceptance Model (TAM) Theory*

The Technology Acceptance Model (TAM) and its extensions have been widely used in library and information science research to understand user perceptions and acceptance of new technologies. These models and frameworks, which identify factors influencing technology acceptance, are crucial for predicting the level of technology adoption . TAM, in particular, has been found to be a robust model for understanding end-user adoption of technology (Corneli et al., 2022). The Unified Theory of Acceptance and Use of Technology (UTAUT) is an extension of TAM that further explores technology acceptance and use (Dissanayake et al., 2022).

The Technology Acceptance Model (TAM), is a widely recognized theoretical model within the field of information systems. This model primarily focuses on understanding how users accept and use technology (Yusoff et al., 2022). According to the TAM, user acceptance is determined by two specific factors: perceived usefulness and perceived ease of use. Perceived usefulness refers to the degree to which a person believes using a particular system would enhance their job performance. On the other hand, perceived ease of use denotes the degree to which a person believes using a system would be free of effort (Manandhar, 2021). The central notion of TAM is that perceived ease of use and perceived usefulness influence an individual's intention to use a system, affecting their actual usage behavior. Over the years, TAM has been empirically tested and validated through numerous studies across different technologies and contexts, making it a fundamental model for understanding user acceptance of information systems (Ahmed et al., 2020).

*Digital Transformation*

Digital transformation has been found to significantly improve efficiency in the banking sector, with benefits including cost and time savings, and a more sustainable environment. This transformation also plays a crucial role in enhancing customer experience, with critical success factors identified as a key driver of this improvement (Sahu, 2018). The linkage between digital transformation and customer experience is further emphasized, with the former being a key enabler of the latter (Shabani Shojaei, 2022). The positive impact of digital transformation on firm performance is underscored, with customer experience and IT innovation identified as key drivers (Masoud & Basahel, 2023).

Digital transformation has been identified as a critical factor in improving customer experience, with a focus on the value propositions delivered to end customers (Sahu, 2018). This transformation is driven by the need to personalize marketing tools and embrace all interactions between sellers and customers. The use of multiple communication channels and the ability to start their journey anywhere, anytime, and from any device are key aspects of this transformation.

**research methodology**

This study adopts a quantitative research approach to systematically evaluate the influence of digital transformation on customer experience enhancements within a retail business organization. The guiding theoretical framework for this research is the Technology Acceptance Model (TAM), a robust foundation for assessing key facets such as efficiency, customer service communication, and after-sales support concerning customer satisfaction. To fulfil the study's objectives, data will be gathered through structured surveys distributed among customers affiliated with the selected retail business company.

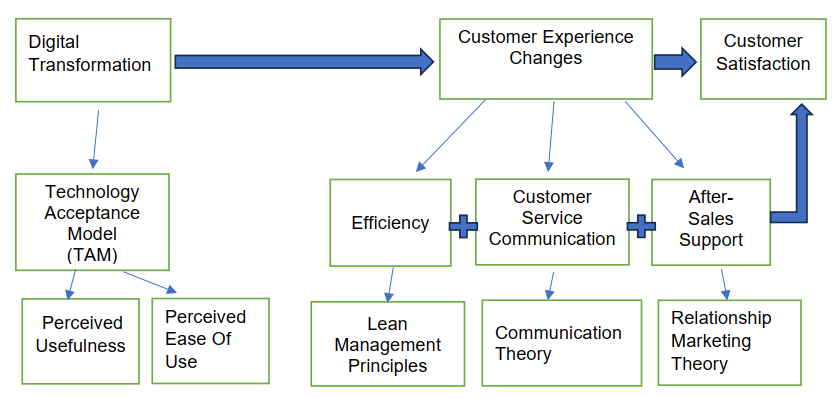
The survey questionnaire has been designed to gauge the following pivotal variables: Digital transformation benefits (independent variable); Perceived Usefulness of digital transformation (independent variable); Perceived ease of use of digital transformation (independent variable); Customer experience changes, encompassing efficiency, customer service communication, and after-sales support (dependent variables)

The data collection will employ a Likert scale, allowing respondents to articulate their perceptions and opinions accurately. The survey will be administered via electronic means, and respondents will be selected randomly from the company's extensive customer database, ensuring a diverse and representative sample.

After data collection, comprehensive statistical analyses will be conducted, including correlation and regression analyses. These analytical tools will be used to scrutinize the intricate relationships between digital transformation benefits, perceived usefulness, perceived ease of use, and customer experience alterations. Furthermore, this investigation will extend its purview to comprehend how these interrelated factors collectively influence customer satisfaction within the dynamic landscape of the retail business context.

*Theoretical Framework*

The theoretical framework of the study is presented in Fig.1.



Theoretical Framework

*Data Analysis Method*

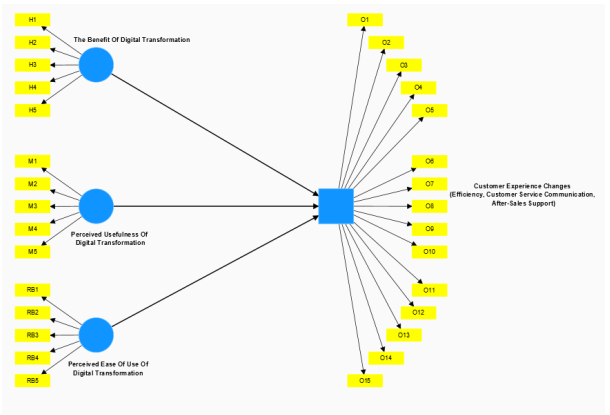
For the data analysis in this study, SmartPLS 4 (Partial Least Squares Structural Equation Modeling - PLS-SEM) software will be used. This method is particularly suitable for complex model testing in research with multiple constructs, as is the case in this study, where we examine the relationships between digital transformation benefits, perceived usefulness, ease of use, and customer experience changes (Bansal et al., 2023). SmartPLS 4 is chosen for its ability to handle both small and large sample sizes and its effectiveness in managing complex models with multiple mediator and moderator variables. It provides robust outcomes even with non-normally distributed data, making it highly applicable to this study's quantitative approach.

**results**

By using SmartPLS 4 Software to compute the data, descriptive analysis of the final result will be presented in this section.

*Structural Model*

The PLS-SEM Model is presented in Fig. 2.



PLS-SEM Model

*Outer Loading*

The provided data reflects the outer loadings from a structural equation model, revealing the relationship strength between observed items and their respective latent constructs in digital transformation.

Outer Loading



The provided data reflects the outer loadings from a structural equation model, revealing the relationship strength between observed items and their respective latent constructs in digital transformation. Specifically, items H1 through H5 measure the construct "The Benefit Of Digital Transformation," with loadings ranging from 0.751 to 0.858. These figures suggest a robust association between the items and the construct, indicating that these items are reliable indicators of the benefits derived from digital transformation initiatives.

Items M1 through M5 pertain to "Perceived Usefulness Of Digital Transformation," displaying high outer loadings between 0.814 and 0.897. Such strong loadings suggest these items are very effective measures of the construct, signifying that these items consistently and strongly capture respondents' perceptions of the usefulness of digital transformation.

The items labeled O1, O10 through O15, and O2 through O9 are linked to "Customer Experience Changes," including efficiency, customer service communication, and after-sales support. The outer loadings for these items show more variation, ranging from 0.683 to 0.863. While most of these loadings indicate a strong relationship with the customer experience changes construct, a few are on the lower end, which could imply a weaker relationship for some items within this domain.

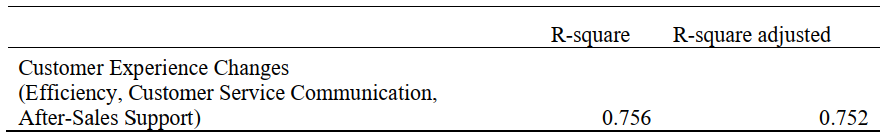
Lastly, items RB1 through RB5 are associated with "Perceived Ease Of Use Of Digital Transformation," where the loadings vary from 0.708 to 0.932. The high loadings of items RB3 and RB4 underscore their representational solid quality for the ease of use construct.

In structural equation modeling, outer loadings above 0.7 generally indicate a solid indicator-construct relationship, suggesting these items are robust measures of their respective constructs. The collected data here, therefore, presents a model where most items are valid indicators, and consequently, the latent constructs are well-represented by the observed variables, affirming the soundness of the model in capturing the nuances of digital transformation.

*Coefficient Of Determination*

The dataset incorporates R-squared and adjusted R-squared metrics for a construct termed "Customer Experience Changes," encompassing aspects like "Efficiency, Customer Service Communication, and After-Sales Support."

R Square



R-squared (R²) is a statistical measure in regression analysis, signifying the variance proportion in the dependent variable (DV) accounted for by independent variables (IVs) in the model. For instance, an R-squared value of 0.756 implies that about 75.6% of the variance in "Customer Experience Changes" is explained by the model's efficiency, customer service communication, and after-sales support variables.

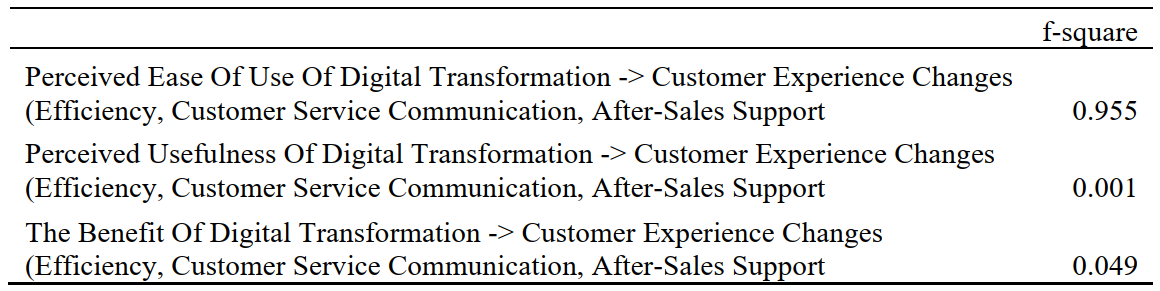
Adjusted R-squared compensates for the number of predictors relative to the observation count, offering a more nuanced model fit assessment by considering model complexity (i.e., predictor count). An adjusted R-squared of 0.752, closely aligning with the R-squared value, indicates the relevance of the independent variables and suggests a lack of extraneous predictors. This high figure denotes a robust model fit, affirming the selected variables as effective predictors for variations in customer experience.

The robustness of the R-squared and adjusted R-squared values highlights the model's efficacy in elucidating the variance in "Customer Experience Changes." This emphasizes efficiency, customer service communication, and after-sales support in influencing customer experience. Moreover, the marginal discrepancy between R-squared and adjusted R-squared values underscores the appropriateness of the predictor count concerning the observation volume, indicating that the model is balanced.

*F-square*

The data presented shows f-square values, which are effect size measures used in structural equation modeling to evaluate the impact of independent variables on dependent variables. Here, the independent variables are different aspects of digital transformation, and the dependent variable is customer experience changes, which include efficiency, customer service communication, and after-sales support.

F Square



Perceived Ease Of Use Of Digital Transformation: The f-square value of 0.955 suggests that the perceived ease of use of digital transformation significantly affects the changes in customer experience. This implies that improvements or variations in how easily digital transformation is perceived can significantly influence customer experience efficiency, service communication, and after-sales support.

Perceived Usefulness Of Digital Transformation: An f-square value of 0.001 indicates a negligible effect of the perceived usefulness of digital transformation on customer experience changes. This suggests that even if digital transformation is perceived as useful, it does not necessarily result in noticeable changes in customer experience regarding efficiency, communication, or support.

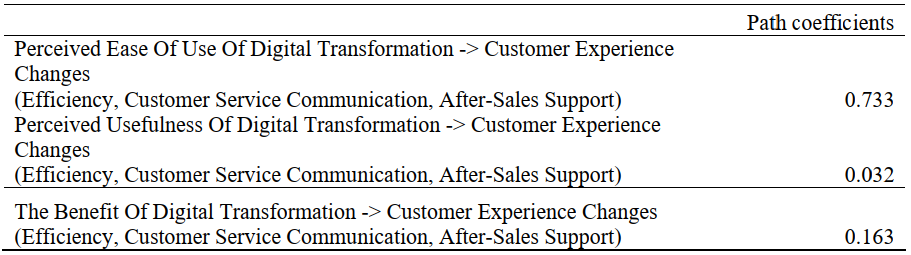
The Benefit Of Digital Transformation: With an f-square value of 0.049, the benefit of digital transformation has a small but potentially meaningful effect on customer experience changes. This indicates that recognizing the benefits of digital transformation can positively impact how customers perceive their experiences with efficiency, communication, and aftersales support.

In summary, among the factors examined, perceived ease of use is a critical driver of customer experience changes following digital transformation, while perceived usefulness has little to no effect, and the benefits recognized have a small effect (Guo et al., 2020). This information can be precious for businesses as they strategize on which aspects of digital transformation to prioritize to enhance customer experience.

*Path Coefficient*

The data provided includes path coefficients from a structural equation model, which quantify the strength and direction of the relationship between independent variables (related to digital transformation) and a dependent variable (customer experience changes, encompassing efficiency, customer service communication, and after-sales support).

Path Coefficients



Perceived Ease of Use of Digital Transformation: A path coefficient of 0.733 is relatively high, suggesting a strong positive relationship between the perceived ease of use of digital transformation and improvements in customer experience. This means that if the ease of use of digital transformation is perceived to be higher, it is strongly associated with significant positive changes in customer experience related to efficiency, customer service communication, and after-sales support.

Perceived Usefulness of Digital Transformation: The path coefficient here is 0.032, which is relatively low, indicating a fragile positive relationship between the perceived usefulness of digital transformation and customer experience changes. While there is a positive connection, it is not strong enough to suggest that perceived usefulness significantly influences customer experience changes.

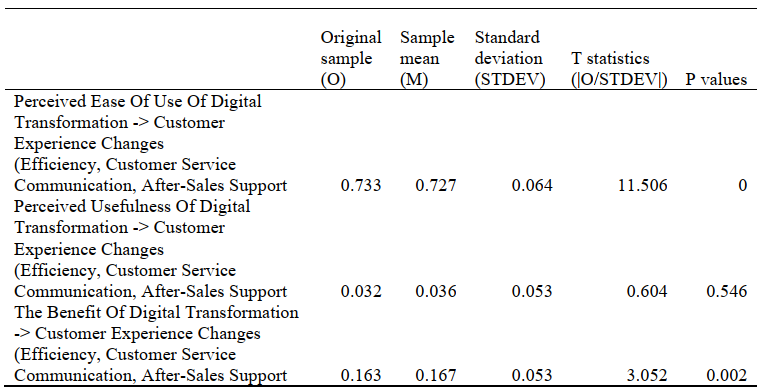
The Benefit Of Digital Transformation: With a path coefficient of 0.163, there is a modest positive relationship between recognizing the benefits of digital transformation and customer experience changes. This suggests that seeing the benefits of digital transformation has a positive but not strong impact on customer experience regarding efficiency, communication, and support.

In essence, these path coefficients suggest that the perceived ease of use has the most substantial positive impact on customer experience changes among the three digital transformation aspects considered. In contrast, perceived usefulness has a minimal impact, and the benefits of digital transformation have a moderate positive effect. This information could be instrumental for organizations prioritizing aspects of digital transformation that could lead to the most significant improvements in customer experience.

*P Values*

The provided data shows p-values linked to the statistical importance of path coefficients in a model. This model examines how different digital transformation elements impact customer experience changes.

Summary of P Values



For the "Perceived Ease Of Use Of Digital Transformation," the p-value is reported as 0. This extremely low p-value suggests that the path coefficient of 0.733 is statistically important. It implies that a strong positive link between perceived ease of use and changes in customer experience is not likely due to chance. The T statistic 11.506 significantly exceeds the usual significance threshold, typically T values above 2 for a two-tailed test at a 0.05 significance level.

The "Perceived Usefulness Of Digital Transformation" shows a path coefficient of 0.032 with a p-value of 0.546. This p-value exceeds the standard alpha level of 0.05, indicating no statistical proof that perceived usefulness notably impacts customer experience changes. The T statistic of 0.604 is below the necessary threshold for statistical significance.

For "The Benefit Of Digital Transformation," the path coefficient is 0.163 with a p-value of 0.002. This low p-value indicates a significant relationship between the benefits of digital transformation and changes in customer experience. The T statistic 3.052 surpasses the standard threshold, suggesting this relationship is not due to chance.

In summary, p-values help determine whether to accept or reject the hypothesis of no relationship (the null hypothesis). Here, the hypothesis that perceived ease of use and benefits of digital transformation do not influence customer experience changes would be rejected, as the p-values are below 0.05, showing significant relationships. However, the hypothesis would be accepted for perceived usefulness since the p-value does not fall under the 0.05 threshold, indicating that the observed relationship might be due to random data variation.

**Conclusion**

The research aimed to explore the correlations between digital transformation and its impact on customer experience changes in retail businesses, focusing on efficiency, customer service communication, and after-sales support. The findings were then compared with existing literature to determine similarities or differences. The research revealed a strong positive link between the perceived ease of use of digital transformation tools and improvements in customer experience, as indicated by a p-value of 0. This finding aligns with the Technology Acceptance Model (TAM), which emphasizes the importance of ease of use for technology adoption.

However, in contrast to TAM's assertions, the research did not find a significant impact of perceived usefulness on customer experience changes, indicated by a p-value of 0.546. This suggests a possible deviation from existing theories, or the presence of other influential factors not captured in the model.

The study also highlighted the significant benefits of digital transformation in enhancing customer experience, as evidenced by a path coefficient of 0.163 and a p-value of 0.002. This finding resonates with previous research on MSEs in customer experience and innovation, emphasizing the positive impact of digital transformation in business operations and customer relations. Additionally, the principles of Lean Management, which focus on creating value for customers, further support the current research's emphasis on the benefits of digital transformation.

In the research aligns with several aspects of the existing literature, particularly in recognizing the significant role of digital transformation in improving customer experiences in retail businesses. The emphasis on the perceived ease of use is consistent with existing theories, highlighting its importance in technology adoption and its impact on customer experience. However, the lack of significant impact from perceived usefulness suggests a potential gap in understanding what aspects of digital transformation customers find beneficial. This discrepancy underscores the complexity of customer experiences in the digital age and opens avenues for future research to explore these dynamics more comprehensively.

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# ARTCAL NO 1O: UNDERSTANDING FACTORS INFLUENCING ONLINE CONSUMER PURCHASING BEHAVIOR FOR FASHION ACCESSORIES PRODUCTS

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*Abstract*— Malaysia's e-commerce industry has exploded in recent years and online shopping has become increasingly popular among consumers. However, there is a noticeable lack of factors influencing online shopping behavior in the fashion and accessories sector, especially in the Malaysian context and especially among adults living in the Klang Valley. This study aims to address this gap by conducting an in-depth study of the determinants of fashion and accessory purchasing behavior among Malaysian adults in the Klang Valley region. Based on established theoretical frameworks such as the Technology Acceptance Model (TAM) and related literature on electronic business and consumer behavior, this study forms a strong conceptual framework to guide the study of factors influencing online purchase decisions. These factors include perceived usefulness, perceived ease of use, attitude, perceived risk, trust, website design, vendor characteristics, and purchase intentions. The main purpose of this study is to investigate the relationships between these identified factors and online shopping behavior, which will provide valuable information to online retailers operating in the Malaysian online shopping market. Quantitative research will collect data through structured surveys conducted on a sample of Malaysian adults living in the Klang Valley. Analyzing this data enables a nuanced understanding of how these factors work together and influence consumer behavior when purchasing fashion and accessories online. Using quantitative research, data collected through structured questionnaires from Malaysian adults living in the Klang Valley. Analyzing this data provides insight into the interaction of these factors and how they influence consumer behavior when buying fashion and accessories online. The study helps both theoretically and practically by providing online retailers with information to improve online shopping and thus promote better customers satisfaction, trust and loyalty. The study, which uses advanced statistical techniques, provides a nuanced understanding of the hierarchical structure that influences online consumer decision-making. The study uses 153 responses collected over two months via Google Forms.

Keywords—B2C E-Commerce, Fashion and Accessories, Consumer Behavior

**Introduction**

Online fashion and accessories retailing consist very large market share of total online sales in Malaysia. Most of the traditional retailers have recognized internet will become powerful marketing channel with the steady growth of market size (Jai & Tung, 2015). Online consumers expect high standard of online service quality since it is much easier to compare price online thus online service quality play a significant key factor for consumers (Santos, 2003). Prioritizing an in-depth understanding of online service quality or factors influencing consumer online shopping is essential for enhancing the competitiveness of online stores.

There is the involvement of money and personal information when purchase via internet therefore online consumers always concern about safety of the site and protection of customer information (Parasuraman, Zeithaml & Malhorta, 2005). According to Sharma & Sheth (2004), indicated that privacy and security has been a critical issue in online retailing because there is the risk that is related to misuse of personal information and causes people afraid to buy products through internet. Therefore, privacy and security are one of the main factors that influence consumers’ shopping outcome (satisfaction and shopping intention).

With the development of the internet as an important business medium, the business world has recently changed tremendously. E-commerce has experienced significant and rapid growth in the current business world. E-commerce refers to web-based commercial transactions (Kotler, 2012). Many companies are attempting to gain competitive advantages by using ecommerce as business platform (Lee & Lin, 2005). The development technology of internet has created unlimited opportunities for e-commerce due to the compelling advantages that offers over conventional bricks and mortar stores such as greater flexibility and market outreach, lower cost structures, broader product line, smoother transaction, convenience, and customization.

However, in recent years one of the most drastic changes in shopping behaviour by most of the consumers in apparel buying have shifted from offline to online. At the same time, more and more apparel retailers are adopting the technology of internet as their major business platform due to lower cost. However, the advance technology development of internet creates intense competition among online retailers in marketplace. Besides that, easy interaction with customers via online allows the internet-based business to grow tremendously and rapidly. Lee and Lin (2005) stated that most experience and success retailers are beginning to realize that key determinants of success not merely depend on presence of websites and lower price but also includes the online service quality.

Nevertheless, without a proper quality management from its systems, staff, and supplier, it is very hard to satisfy customers due to retailers unable to deliver the appropriate level of service quality (Cox & Dale, 2001). Effectively managing online stores that influence customer satisfaction not only for online retailer but also essential for multichannel retailer due to the reciprocal effects across the channel (Venkatesan, Kumar & Ravishanker, 2007). According to Finn earlier study in 2008 (as cited in Ha & Stoel, 2012) stated those customers who have a bad online shopping experience appear to resist shop through the retailer’s other channels. Therefore, customer online shopping satisfaction plays an important role to sustain the growth of not only the online business but also the overall business.

Thus, it is crucial for apparel retailers to understand the determinants of online shopping quality and key factors that influence consumer shopping outcome such as online shopping satisfaction and online shopping intention (Lee & Lin, 2005; Ha & Stoel, 2012). Hence, identifying the online shopping quality dimensions that influence consumer shopping outcomes (e-satisfaction and shopping intention) requires a comprehensive framework.

**literature review**

*Overview of E-Commerce*

E-commerce, or electronic commerce, has revolutionized the business landscape by facilitating the online exchange of goods and services (Chaffey et al., 2006). This digital model transcends geographical boundaries, allowing businesses to connect with a global audience and providing consumers the convenience of anytime, anywhere shopping (Turban et al., 2015). The four main types of e-commerce transactions involve businesses selling to consumers (B2C), businesses trading with each other (B2B), consumer-to-consumer exchanges (C2C), and individuals offering products or services to businesses (C2B) (Laudon & Traver, 2020). One of the key advantages of e-commerce is its global reach, enabling businesses to expand their market presence beyond physical limitations (Turban et al., 2015).

*Application Of E-Commerce In The Fashion Industry*

The application of e-commerce in the fashion industry has significantly transformed the way consumers engage with and purchase clothing, accessories, and footwear. Online platforms have become a central hub for fashion enthusiasts to explore a vast array of styles, brands, and trends, offering an extensive catalogue that traditional brick-and-mortar stores may struggle to match (Bhardwaj & Fairhurst, 2010). E-commerce in the fashion sector has democratized access to fashion, allowing consumers from around the globe to discover and acquire the latest designs and runway-inspired looks with a simple click. Brands and retailers leverage ecommerce to showcase their collections, enabling consumers to browse, compare, and make informed purchase decisions at their convenience (Hines & Bruce, 2007). Moreover, the integration of augmented reality (AR) and virtual try-on features in e-commerce platforms enhances the online shopping experience in the fashion industry. Customers can virtually try on clothing items, ensuring a better fit and reducing the uncertainty associated with online apparel purchases (Choi, 2022). Social media integration further amplifies the impact of e-commerce in fashion, as users share their style preferences, fashion hauls, and reviews, creating a dynamic and interactive online community.

*Technology Acceptance Model (TAM)*

The Technology Acceptance Model (TAM) explores how users accept and use technology. Research applying TAM demonstrates its efficacy in assessing online transaction intent, perceived web protection, and usability (Hoque et al., 2021). TAM's application in understanding factors such as online shopping design, website reliability, and customer service is also evident.

*Theories of planned behavior (TPB)*

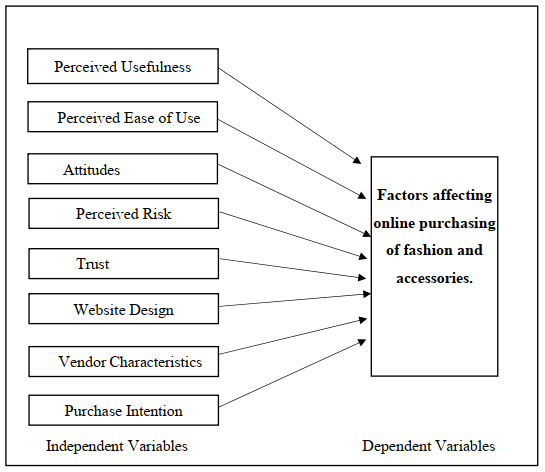
The Theory of Planned Behaviour (TPB), proposed by Ajzen (2020), establishes links between attitude and behaviour. TPB's components, including behavioural beliefs, normative beliefs, and control beliefs, provide a comprehensive understanding of the factors influencing consumer actions.

**research methodology**

The approach used for this study is quantitative method. Quantitative research permits a researcher to test their hypotheses and depends on numerical data to support their discovery, avoiding speculation, reduce manipulation and bias that happen in interpretative research. The main purpose of this study was to study the factors affecting online purchasing of fashion and accessories among Malaysian Adults from Klang Valley. Thus, we intentionally selected respondents for this study from among Malaysian adults residing in Klang Valley who use the internet to purchase fashion and accessories products. The population refers to any number of attributes or qualities within a group that a researcher uses to make inferences about the subjects in research. This study was to examine on factors affecting online purchasing of fashion and accessories among Malaysian Adults from Klang Valley. Therefore, the population of this study is Klang Valley consumers.

*Conceptual Framework*

Based on TAM and TPB, this research assumes that perceived usefulness, perceived ease of use, attitude, perceived risk, trust, website design, vendor’s characteristics and purchase intention is the factors affecting online purchasing of fashion and accessories among Malaysian Adults from Klang Valley. Therefore, we suggested the conceptual framework as depicted in the Fig. 1.



Conceptual Framework

*Data Analysis Method*

The utilization of SMART PLS 4 software for data analysis was deliberate, leveraging its strengths in handling small sample sizes effectively. The selection of analytical techniques aligns with the research questions and hypotheses, aiming to provide insights into the factors influencing online purchasing behaviour in the fashion and accessories domain among Malaysian adults from Klang Valley.

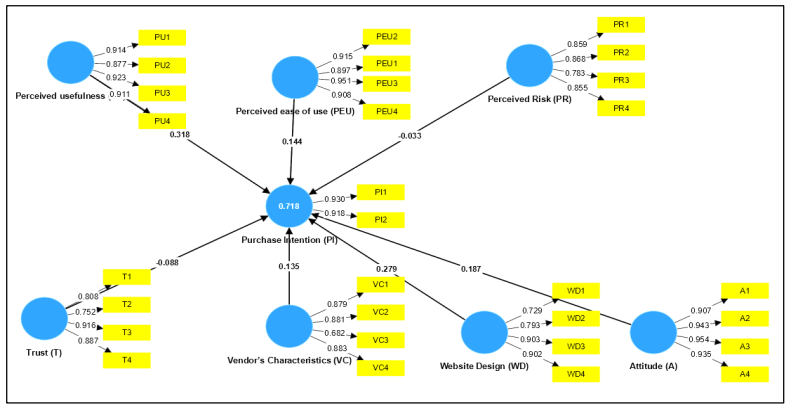
The choice of SMART PLS 4 software for data analysis was deliberate due to its suitability for handling small sample sizes effectively. Given the study's focus on online purchasing behaviour in the fashion and accessories domain among Malaysian adults from the Klang Valley, where sample sizes may be limit, SMART PLS is well-suited for structural equation modelling (SEM) in exploratory studies. It allows for the examination of relationships between variables without strict adherence to pre-existing theoretical models.

**results**

In this section, a descriptive analysis of the results is carried out using the data calculation program SMART PLS 4.

*Structural Model*

The data demonstrates a reliable and well-developed measurement model, indicating that scales measuring attitude, perceived risk, ease of use, usefulness, purchase intention, trust, vendor features, and website design are internally consistent and valid.

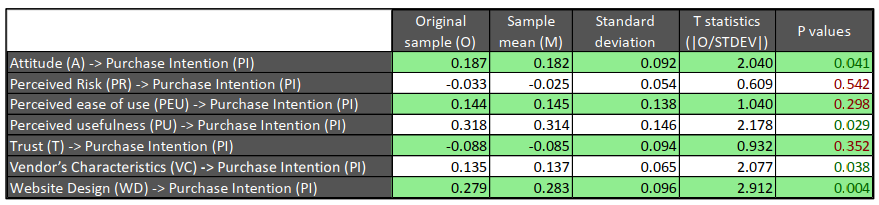


PLS-SEM Model

*Structural Model Path Coefficients*

After evaluating the validity and reliability of the model, a PLS-SEM analysis of the path coefficient was performed. The path coefficient is one of the methods for studying the structural model. In this study, bootstrapping is employed to evaluate standard deviations, T-statistics, and P-values.

Summary of Structural Model Path Coefficient



The study presents data on the relationship between attitudes, perceived risk, ease of use, and website design in a structural equation model. Attitude has a significant positive effect on purchase intention, with a path coefficient of 0.187, indicating a positive effect. However, the relationship between perceived risk and purchase intention is not statistically significant, with a path coefficient of -0.033 and a non-significant P value of 0.542.

Perceived ease of use has a path coefficient of 0.144, a T-statistic of 1.04, and a non-significant P value of 0.298. Perceived usefulness has a path coefficient of 0.318, a T-statistic of 2.178, and a significant P-value of 0.029. Trust, vendor characteristics, and website design have statistically significant relationships with positive path coefficients, with trust and provider characteristics having T-statistics of 0.932 and 2.077 respectively, while website design has a relatively higher T-statistic of 2.912 and a low P-value of 0.004.

The results provide valuable information about the meaning and direction of the relationships between constructs examined in the structural equation model. The P-value, or probability value, evaluates evidence against a null hypothesis, and the study suggests that businesses should prioritize strategies that enhance and cultivate positive consumer attitudes to positively influence purchasing decisions.

*Coefficient of Determination*

R-squared and adjusted R-squared are statistical measures used in regression analysis to assess the proportion of variance in a dependent variable.

R-Square

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In this scenario, the R-squared value of 0.718 indicates that 71.8% of the variance in purchase intention can be explained by the independent variables in the regression model. This suggests that the model is effective in accounting for observed variability in purchase intention values. The adjusted R-squared value of 0.704 penalizes irrelevant predictors and is slightly lower than the R-squared. A high R-squared value indicates the model can explain the variability in purchase intention values. However, researchers should consider the study context, limitations, and potential improvements in the model's explanatory power.

*Effect Size*

The regression model predicts purchase intention using f-squared values.

F-Square Values

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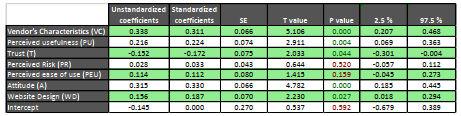
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The perceived utility (PU) accounting for 7.8% of the variance after controlling for other factors. Website design (WD) also contributes to 6.2% of the variance. Attitude and provider characteristics account for 3.6% and 2.9%, respectively. Perceived risk, ease of use, and trust have smaller effects, each explaining less than 1% of the variance. These f-squared values help researchers and practitioners prioritize influential factors and refine strategies to improve purchase intent.

*Regression Analysis*

Table IV represents the regression analysis of the study.

Regression Analysis



Unstandardized coefficients represent the change in the dependent variable (DV) for a one-unit change in the independent variable (IV), while standardized coefficients represent the change in the dependent variable in terms of standard deviations for a one-standard-deviation change in the independent variable. These coefficients allow for comparison of the relative importance of different independent variables. The Standard Error (SE) represents the standard deviation of the sampling distribution of a coefficient, used to calculate confidence intervals and T-values. The T-value measures the number of standard deviations a coefficient estimate is from zero, and the P-value is the probability of obtaining a T-value as extreme as or more extreme than the observed one if the null hypothesis were true. The 2.5% and 97.5% values represent the lower and upper bounds of the 95% confidence interval for each coefficient.

*ANOVA Analysis*

Table V represents the ANOVA analysis of the study.

ANOVA Analysis

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This ANOVA analysis evaluates the significance of a regression model by analyzing the Total Sum of Squares (SST), degrees of freedom (df), mean square (MS), F-statistic (F), and P-value. The SST represents the total variability in the dependent variable, while df represents the number of values that are free to vary. The mean square (MS) is the sum of squares divided by its degrees of freedom, with values for Total, Error, and Regression. The F-statistic (F) is the ratio of the mean square for Regression to the mean square for Error, and a low P-value (0.000) indicates that the observed variation in the dependent variable is unlikely to be due to random chance.

**Conclusion**

The study explores online fashion and accessories purchasing behavior among Malaysian adults in the Klang Valley using SMART PLS 4 data calculation programs. The descriptive analysis provides a rich demographic profile, while visual representations like pie charts and graphs provide clarity on demographic patterns, online platform preferences, and purchase frequency. The measurement model was evaluated using PLS-SEM, with a focus on reliability, convergent validity, and discriminant validity. The structural model path coefficients reveal the relationships between factors and their impact on purchase intention, with attitude, perceived usefulness, and website design as significant influencers.

The analysis extends beyond statistical metrics to practical implications. The demographic insights and validated measurement model provide a comprehensive understanding that is academically relevant and immediately applicable in real-world scenarios. Businesses can use these findings to tailor their marketing strategies, enhance platform design, and build consumer trust effectively.

The study's combination of statistical rigor, practical insights, and actionable recommendations positions it as a valuable contribution to both academia and industry. The study unveils the intricate tapestry of online consumer behavior, paving the way for further exploration in subsequent chapters.

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# Article 11: AN ANALYSIS OF FACTORS THAT AFFECT CONSUMERS’ ONLINE PURCHASE INTENTION FOR PREMIUM PRODUCTS IN MALAYSIA

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***Abstract*—** This study aims to analyze the factors influencing consumers' online purchase intention for premium products, particularly exploring the interrelationship between perceived risk, perceived quality, and customer reviews. The research holds significant value for businesses, retailers, and marketers as it provides insights into crucial aspects that can likely entice consumers to make online purchases for premium products. By understanding the importance of perceived risk, perceived quality, and customer reviews from the perspective of potential customers, businesses can enhance their marketing and promotional strategies to reinforce purchase intention effectively through e-commerce space. Additionally, the study highlights the significance of integrating customer cues in marketing initiatives, allowing businesses to tailor their approaches and boost purchase intention for premium products. Ultimately, the findings of this research are expected to permit businesses and retailers to enhance consumers’ purchase behavioral intentions and, hopefully, shift such intentions to actual purchase, leading to increased sales and improved customer satisfaction.

**Keywords—Perceived Risk, Perceived Quality, And Customer Reviews, Online Purchase Intention**

**Introduction**

The body of knowledge surrounding consumers' buying intention has been extensively explored by scholars in the field of consumer behaviour and marketing. One of the trailblazers that fundamentally contributes to this field is Ajzen, who introduced the Theory of Planned Behaviour (TPB) in 1985. This theory has been applied for, among others, predicting consumer behaviour in a variety of settings (Seow et al., 2017), examining the relationship between perceived risk and attitude (Wang et al., 2020), predicting the effect of attitude on intention (Chetioui et al., 2020), and analysing the impact of customer reviews on purchase intention (Handarkho, 2020).

Apart from TPB, there are other two models that have been examined in this field in the context of purchase intention namely the Signalling Theory (Atkinson & Rosenthal, 2014) and the Risk Perception Theory (Masoud, 2013). While previous studies have largely focussed on the application of each model individually, there is a lack of in-depth understanding on how these theories can be integrated to develop a novel conceptual framework to provide a basis for analysing consumers’ buying intention.

Moreover, previous studies in the field of consumer behaviour in relation to expensive consumer goods have primarily emphasised on purchase intention for luxury products, rather than premium products. Citing some examples, Salem & Salem (2018) examined the factors influencing purchase intention for luxury fashion goods, Ko et al., (2019) and Fu (2020) proposed a universally accepted definition of luxury goods to be established, Hopper (2021) found the relationship between luxury products and customers’ trust in certain brands, Ashfaq et al., (2018) discovered the impact of perceived risk on online buying behaviour of luxury brands, and Husic & Cicic (2009) described luxury products as high-value prestigious goods that evoke consumers’ confidence and increase their self-esteem.

On the other hand, there is only a handful of literature on premium products which include, among others, investigation into the effect of online customer reviews towards purchase behaviour of premium cosmetic products (Sutanto & Aprianingsih, 2016), analysis of the characteristics of a premium house brand (Immonen, 2010), and examination of the relationship between quality and premium products sold under a house brand (Chaniotakis et al., 2009). As such an in-depth understanding of purchase intention towards premium products in the field of consumer behaviour is still inadequate.

Additionally, existing studies have explored various other factors such as trust and security, perceived ease of use and usability, perceived usefulness, social influence, website design and layout, and demographics (Aydın, 2019; Escobar-Rodríguez & Bonsón-Fernández, 2017; Moslehpour et al., 2018). However, there is a lack of research that specifically investigates the effect of and the interrelationship between three specific variables - perceived risk, perceived quality, and customer reviews - on consumers’ purchase intention. Hence, there is still a need for rigorous knowledge in this field by looking at such factors and the combination of these factors in affecting consumers’ purchase intention.

**literature review**

*Online Purchase Intention*

The existing body of literature extensively explores the concept of customers' purchase intention within the space of e-commerce, encompassing various platforms like businesses' websites, online shopping platforms, and social media. Raman (2019) emphasised the importance of understanding consumers' intention to engage in online shopping, as it directly influences their readiness to make internet-based purchases. Meanwhile, Petersen et. al. (2018) stressed the effectiveness of intentional measures over behavioural measures in comprehending customers' mindsets. It becomes crucial to discern whether online purchases are driven by genuine preferences or constraints, making the examination of factors influencing online purchase intention a critical aspect of research in this field of consumer behaviour and marketing.

*Perceived Risk and Online Purchase Intention*

The relationship between risk perception and purchase intention has been the subject of investigation in various domains (Ariffin et al., 2018; Lăzăroiu, 2020; Yu, 2018). Meanwhile, Chen & Chen (2017) highlighted the contrast between in-store shopping, where consumers can physically assess products and interact with sales personnel, and online shopping, which lacks these opportunities, leading to heightened risk perception. A high perceived risk may, in turn, result in a perception of lower control over the online purchase decision, leading to hesitancy to buy products online. This is in line with the Theory of Risk Perception, whereby, consumers tend to avoid risk whenever possible (Rejikumar et al., 2022) and, therefore, an increase in perceived risk will reduce their willingness to purchase.

*Perceived Product Quality and Online Purchase Intention*

In order to establish context, this analysis begins with purchase intention through traditional instore approach whereby, according to Cahyani et al. (2017), perceived quality along with brand image and price have a significant effect on consumers purchase decision. Chen & Chen (2017) pointed up that the ability of consumers to physically inspect the quality of products has a significant influence on buying motivation. Moving on to the perspective of online purchase, Choudhuri (2018) found that perceived product quality, price orientation, and scepticism towards online shopping have a significant impact on online purchase intention. Hence, irrespective of shopping methods, the above findings suggest that perceived quality plays a pivotal role in influencing purchase intention.

*Customer Reviews and Online Purchase Intention*

In tandem with the Signalling Theory, the importance of customer reviews as a means of providing product cues was discussed by Gai (2014) who highlighted insights how consumers, due to the inability to physically interact with the products, heavily rely on the available product information, images, videos, and customer reviews. According to Yang et al. (2019), the presence of customer reviews influences customers’ perception of the quality of premium products which, in turn, affects their purchase intention in line with the TPB. Customers’ reliance on digital cues stresses the importance for businesses to provide relevant and sufficient information to facilitate a seamless and satisfying buying experience for consumers of premium products.

**research methodology**

Data is gathered using a single quantitative data collection technique through the use of an online structured questionnaire. The questionnaire is developed using Google Form and the link is distributed solely using a messaging application namely WhatsApp. The target population for this study comprises Malaysian consumers who have generally engaged in online shopping, in particular those who intend to purchase premium products in the near future.

*Conceptual Framework*

Taking cue from the overall literature review discussed earlier, the three important independent variables that can significantly affect the dependent variable are recognised as shown in Fig. 1.

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Conceptual Framework

*Data Analysis Method*

The primary analysis method of this study employs Structural Equation Modelling (SEM) to examine the data gathered relating to the factors affecting consumers’ online purchase intention for premium products. In employing the above method, Smart-PLS4 application will be used to establish models, thereby allowing pertinent information and data to be quickly analysed to facilitate the development of research findings. Such findings serve as a basis for accepting or, otherwise, rejecting the hypotheses. Smart-PLS4 application is a program that uses the Partial Least Squares (PLS) path modelling method for variance-based Structural Equation Modelling (SEM) where models can be estimated with data using its bult-in algorithms.

**results**

In developing the study findings, as described earlier, PLS-SEM method was applied to conduct the analysis.

*Structural Model*

By meeting all the test criteria, the framework can be applied as a structural model to analyse the relationships between the latent constructs and the observed indicators, thereby allowing the hypotheses to be validly examined.

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Structural Model Analysis – Indicating Path Coefficients and P-Values

*Structural Model Path Coefficient*

A path coefficient measures the strength and direction of the relationship between an independent variable and a dependent variable, which also considers the impact of other factors in the model. It reveals how the standard deviation of the dependent variable changes when the independent variable is changed by one standard deviation while the other variables remain constant.

Structural Model Path Coefficient Analysis

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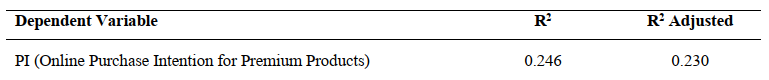
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Employing path coefficients to assess the relationship within the structural model generated results as depicted in Table I. Referring to the P-Values column, all the independent variables recorded values well below 0.05 at a confidence level of 95% indicating that the observed relationships between the variables were statistically significant and thus provide meaningful insights into the analysis. Customer Reviews (CR) recorded a marginally stronger positive effect on consumers’ Online Purchase Intention (0.285, p<0.000) compared to Perceived Quality (0.254, p<0.001). Meanwhile, Perceived Risk had the strongest effect among the independent variables, albeit in an opposite manner, on purchase intention (-0.336, p<0.000). As regards the coefficient values, path coefficients with standardised values above 0.20 are usually acceptable.

*Coefficient of Determination (R-squared Value)*

R-squared is a statistical expression that represents the proportion of variance in the dependent variable that is explained by the independent variables in a regression model.

Coefficient of Determination (R2 Value)



The R-squared value was 0.246 which meant that the independent variables in the model could account for about 24.6% of the variance in the dependent variable. The remaining 75.4% of the variance was not accounted for and could be attributable to other variables not included in this study.

In relation to the Adjusted R-squared, it is a modified version of the R-squared which takes into consideration the number of independent variables in the model. The Adjusted R-squared value is typically slightly lower that the R-squared value as it penalises adding unnecessary variables to the model that may not significantly improve its explanatory power. In this study, the computed R-squared of 0.246 and adjusted R-squared of 0.230 were above the minimum benchmark value of 0.2. In addition, when it comes to predicting human behaviour like purchase intention, the inherent unpredictability of the subject often results in R-squared values falling below 0.5. Thus, the computed R-squared figure of 0.246 in this analysis was reasonable.

*Hypotheses Testing*

*H1: There is a significant relationship between perceived risk and customers' online purchase intention for premium products:* According to the established criteria (Hair et al., 2017), path coefficients with standardised values surpassing 0.20 are deemed substantial, while those falling below 0.10 are considered less substantial in terms of significance. Following the analysis performed, as indicated in Table III, it was observed that Perceived Risk exerted a statistically significant negative influence on Online Purchase Intention, with a coefficient of -0.336, which was above the abovementioned criteria of 0.20, and a p-value of less than 0.001, achieving a confidence level of 95%. A negative influence means that as the perceived risk increased, online purchase intention would tend to decrease, and vice versa. As such, 1-unit increase of standard deviation in Perceived Risk would lead to a decrease of approximately 0.336 units of standard deviation in Online Purchase Intention.

Aggregate Effect of Perceived Risk on Online Purchase Intention

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Hence, the null hypothesis is rejected, and the alternative hypothesis is accepted. In conclusion, there is a significant negative relationship between perceived risk and customers' online purchase intention for premium products.

*H2: Perceived quality significantly impacts customers' online shopping intention for premium products:* As shown in Table IV, there existed a statistically significant positive effect of Perceived Quality on Online Purchase Intention, with a coefficient of 0.254, which was above the recommended criteria of 0.20, and a p-value of much less than 0.05, achieving a confidence level of 95%. A positive effect means that as the perceived quality increased, online purchase intention would tend to increase too and vice versa. As such, 1-unit increase of standard deviation in Perceived Quality would lead to an increase of approximately 0.254 units of standard deviation in Online Purchase Intention.

Aggregate Effect of Perceived Quality on Online Purchase Intention

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Hence, the null hypothesis is rejected, and the alternative hypothesis is accepted. In conclusion, Perceived Quality significantly impacts customers' Online Shopping Intention for Premium Products.

*H3: Customer reviews significantly influence customers' online purchase intention for premium products:* As shown in Table V, there existed a statistically significant positive effect of Customer Reviews on Online Purchase Intention, with a coefficient of 0.285, which was above the recommended criteria of 0.20, and a p-value of less than 0.001, achieving a confidence level of 95%. A positive effect means that as the customer reviews grew, online purchase intention would tend to contract too and vice versa. As such, 1-unit increase of standard deviation in Customer Reviews would lead to an increase of approximately 0.285 units of standard deviation in Online Purchase Intention.

Aggregate Effect of Customer Reviews on Online Purchase Intention

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Hence, the null hypothesis is rejected, and the alternative hypothesis is accepted. In conclusion, Customer Reviews significantly impact consumers' Online Shopping Intention for Premium Products.

*H4: There are significant effects of the demographic profiles of individuals (gender, age, and income) on intention to purchase premium products online:* Having performed the analysis, as indicated in Table VI, it was discovered that Age factor exerted a statistically significant negative effect on Online Purchase Intention, with a coefficient of -0.230, which was above the recommended criteria of 0.20, and a p-value of less than 0.05, achieving a confidence level of 95%. A negative effect means that as the age increased, online purchase intention would tend to decrease, and vice versa. As such, 1-unit increase of standard deviation in Age would lead to a decrease of approximately 0.230 units of standard deviation in Online Purchase Intention. However, Gender and Income did not exert statistically significant effects on Online Purchase Intention as the recorded p-values of 0.338 and 0.679, respectively, were much greater than 0.05.

Structural Model Path Coefficient Analysis (Model A vs Model B)

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Hence, the null hypothesis Age factor is rejected, which means that there is a significant negative relationship between Age and customers' Online Purchase Intention for Premium Products.

Conversely, the null hypotheses relating to Gender and Income are respectively accepted, which means that, there is no significant relationship between Gender and customers' Online Purchase Intention for Premium Products; and there is no significant relationship between individuals’ Income and customers' Online Purchase Intention for Premium Products.

The variables in the model also interacted with each other as depicted in Table VII, whereby, the R-squared recorded a value of 0.299. This suggests that the independent and the demographic variables in the model could account for about 29.9% of the variance in the dependent variable of "Online Purchase Intention for Premium Products". The remaining 70.01% of the variance was not accounted for and could be attributable to other variables not included in this study.

Coefficient of Determination (Model B)

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**Conclusion**

This study illuminates the significance of consumers' perceptions of online shopping risks, product quality, and product reviews as determinants shaping purchase intentions for premium products. The examination yielded compelling results, with the three core hypotheses validated at a robust confidence level of 95%. This substantiates that these factors wield substantial influence over the online purchase intentions for premium products.

The congruence of the study’s findings with those of prior research reinforces the importance of these factors across different contexts. Yet, this study stands apart due to several distinct characteristics. Primarily, while existing literature predominantly investigates luxury products, specific brands, or house-brands, this study concentrates on the sphere of expensive products in a broader sense. Moreover, the approach to constructing the conceptual framework involves a distinct blend of theoretical models, deviating from the typical single-model approach prevalent in many studies. The synergy of the selected independent variables forms a distinctive combination, considering the diverse dimensions within which other influencing factors can be categorized.

It is noteworthy that the R-squared value derived from Model B implies the potential existence of other unexplored factors accounting for 70% of the variance in online purchase intentions for premium products. Nonetheless, despite contributing to approximately 30% of this variance, the identified factors in this study interact synergistically and exert significant influence over consumers' purchase intentions.

In summary, this research underscores the pivotal role of consumers' perceptions regarding risks, quality, and customer reviews in the domain of premium online purchases. The results contribute to a more complete knowledge of consumer behavior in this domain by highlighting the distinctive features of the study and recognizing the potential for other influences. The complex interaction of the factors supports their combined influence on influencing consumers' intentions to purchase premium products online.

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# Article no 12: IMPACT OF MOTIVATION ON EMPLOYEE PERFORMANCE WITH EXTRINSIC REWARDS AND EFFECTIVENESS TRAINING IN A COMPANY

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***Abstract*—** This research delves into the multifaceted impact of motivation on employee performance within a corporate framework, specifically examining the interplay between extrinsic rewards and effectiveness training. The study employs a mixed-methods approach, combining quantitative analysis through surveys and qualitative exploration via interviews and case studies. A comprehensive review of literature on motivation theories, extrinsic rewards systems, and effectiveness training sets the foundation for understanding the complex relationship between motivation and employee performance. The findings reveal a nuanced correlation between motivation, extrinsic rewards, and effectiveness training. Extrinsic rewards, including financial incentives, recognition, and benefits, play a significant role in enhancing short-term performance levels and fostering a sense of appreciation among employees. However, their sustained impact on long-term motivation and performance is contingent on complementing strategies such as effectiveness training. Training programs that equip employees with necessary skills, knowledge, and tools not only contribute to their motivation but also amplify the effects of extrinsic rewards by empowering individuals to utilize these incentives optimally. Furthermore, the research identifies the importance of intrinsic motivation factors, such as job satisfaction, autonomy, and meaningful work, which can significantly influence sustained high performance beyond the scope of extrinsic rewards and training. The implications of this research are manifold for organizations aiming to optimize employee performance. By understanding the intricate relationship between extrinsic rewards, effectiveness training, and intrinsic motivators, companies can design holistic motivational strategies tailored to their workforce, thereby fostering an environment conducive to enhanced performance, increased job satisfaction, and long-term organizational success.

**Keywords—Motivation, Employee Performance, Extrinsic Rewards, Training**

**Introduction**

Employee motivation is critical to the success of any organization. Employees who are motivated are more productive, innovative, and involved in their work. They are also more likely to stay with the company, lowering turnover and saving money on recruiting and training. According to Grant (2008), motivation has an impact on employee outcomes like performance and productivity. He also established that motivated people are more oriented towards autonomy and are more self-driven than less motivated employees. Furthermore, motivated individuals are more engaged and active in their work and jobs, and are more willing to take on responsibilities (Kuvaas, Dysvik & Buch, 2014).

However, since the Covid-19 outbreak, company has struggled with a lack of workforce due to employee turnover, tardiness, and the frequent use of emergency and medical leave. In this situation, Human Resource Management was forced to hire new employees in order to sustain production empowerment. Recently, the corporation announced their intention to extend their business plan. Therefore, they decided to develop employee motivational initiatives to address the difficulties. The growth of any type of employment depends on how motivated the employees are and how long they stay with the organization (Vroom, Porter, & Lawler, 2015). Furthermore, the cost of recruitment and maintenance of employees are significantly reduced, and it can also help in the expansion of vocation if the system can hold the motivated employees for long in the organization (Nyameh et al., 2013).

Early in the year 2022, management adopts an extrinsic rewards system to implement an RM200 incentive policy in motivate employee who arrive on time and work the entire month. Furthermore, the management provides various benefits such as bonuses, allowances, and insurance cover to motivate those who work there. In today's dynamic globalised environment, organizations are continuously seeking to expand and motivate their workers in order to achieve higher levels of performance through the use of various Human Resource applications and practices. Businesses widely use reward management systems to achieve their goals (Güngör & Aydın, 2011).

To instil confidence in employees to continue improving their skills. Therefore, Human resource management provides varied training in order to motivate their employees. The formal process of obtaining knowledge, skills, and competences is known as training. Training practices adopted by organizations have an impact on employee motivation as well as organizational commitment (Meyer & Allen, 1991). Rowden and Conine (2005) state that the purpose of training is to promote employee pleasure with their jobs, and that pleased personnel deliver better service to their customers. Employees who commit to learning are more satisfied with their jobs and perform better as a result (Tsai, 2007). The study looks into how ABC develops approaches in motivated individuals to improve employee performance.

The effectiveness of an organization hinges significantly on the performance of its employees. In today's competitive business landscape, organizations strive to enhance employee motivation to improve performance. As a research paper, the study tries to investigate the employee incentive tactics used by companies to improve organizational performance. The major objective of this study is to examine the elements that encourage people to perform well at work in order to obtain an answer(s) to the research question. Two prominent strategies employed to boost motivation are the provision of extrinsic rewards and the implementation of effective training programs..

The primary goal of this research is to investigate and analyze the impact of motivation on employee performance within a corporate setting, specifically examining the combined influence of extrinsic rewards and effectiveness training. This study aims to provide a comprehensive understanding of how these two motivational factors interact and contribute to enhancing job performance, ultimately benefiting both the individual employees and the organization as a whole. Because appropriate employee motivation is critical to increasing employee job satisfaction and performance. Next, it can improve an organization's efficacy and quality, particularly its business success, which is the core purpose of the corporation.

**literature review**

*Employee Motivation*

Employee motivation, as defined by Shahzadi et al. (2014), is the level of energy, commitment, and creativity that employees bring to their jobs. In a highly competitive labor market, retaining motivated and productive employees is a daunting task. Motivation is not a one-size-fits-all concept; it is a complex and multifaceted phenomenon that varies from one individual to another (Chaudhary et. al., 2012). Motivation can be viewed as the driving force that mobilizes an employee's abilities, energy, and time to fulfil their responsibilities and achieve both personal and organizational goals.

*Employee Performance*

According to Mangkuprawira (2011) said that the performance is the result of a certain work process in a planned manner in order to obtain results according to company standards. Besides that, Rivai (2019), performance is a real behaviour that is displayed by everyone as a work achievement produced by employees in accordance with their role in the company. On the other hand, Sulistiyani (2022) declared that performance is a combination of ability, effort, and opportunity that can be assessed from the results of his work. Employee performance can be measured using the following criteria, according to Mangkunegara (2011): 1) work quality; 2) work quantity; 3) responsibility; 4) cooperation; and 5) initiatives.

*Extrinsic Rewards*

Extrinsic rewards, which include financial incentives like pay, bonuses, promotions, and benefits, play a significant role in motivating employees (Baron, 1988). These rewards are tangible and are often used by organizations to recognize and encourage high performance. However, the effectiveness of extrinsic rewards can vary depending on how they are implemented and perceived by employees. Research by Eisenberger & Stinglhamber (2011) emphasized the importance of an efficient reward system in maintaining employee motivation. A well-designed reward system can lead to increased job satisfaction and improved performance. Conversely, an ineffective reward system can lead to demotivated employees, resulting in issues such as low productivity, conflicts, absenteeism, and high turnover.

*Employee Training*

Employee training is another crucial aspect of enhancing employee performance. Training equips employees with the knowledge and skills necessary to perform their jobs effectively and efficiently. Koh et al. (2010) highlight the role of interactive simulations in training, providing employees with near-real-life experiences that boost their confidence and motivation to excel in their roles. Effective training programs not only improve employees' skills but also enhance their confidence in their abilities (Noe, 2020). Employees who receive proper training are better prepared to meet job requirements and perform tasks efficiently. However, training alone is not sufficient; motivation plays a pivotal role in ensuring that employees apply the knowledge and skills acquired during training to their work effectively (Conte, 2024).

**research methodology**

The research is based on quantitative approach that uses a survey method by collecting data through questionnaires as a measurement tool. A survey is undertaken to collect data on the relationship between employee motivation and employee performance, as well as the demographic parameters and independent variables that mediate employee motivation. The questionnaire is sent among corporate employees via WhatsApp. The number of respondents is 80.

*Conceptual Framework*

The conceptual framework was developed based on the variables identified from the literature review.

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Conceptual Framework

Fig. 1 shows the conceptual framework for the impact of extrinsic rewards and effectiveness training on employee motivation and performance. The conceptual framework given here tries to clarify the complex links between varied extrinsic rewards, effectiveness training, employee motivation, and employee performance within organizational contexts. This framework is intended to provide an organized knowledge of how various aspects interact and influence one another. For the phenomenon of employee motivation and its influence on employee performance to be studied empirically, there is the need for a conceptual framework that pulls together the concepts of employee motivation and employee performance. It demonstrates how variable extrinsic rewards and effectiveness training influences employee motivation. Secondly, employee motivation and effectiveness training influences employee performance. Furthermore, employee motivation appears to be a direct mediator of employee performance.

*Data Analysis Method*

Descriptive analysis is used to investigate the relationship between the variables, while structural equation modelling (SEM) is used to examine the relationship between the variables. A structural model is then created to define the link between variables and to test the hypothesis further. Furthermore, this study examines the impact of extrinsic rewards and effectiveness training on employee motivation level in a company. Employee performance is a dependent variable, with employee motivation serving as a mediator, and extrinsic rewards and effectiveness training serving as independent variables. To examine whether employee motivation is influenced by the independent variable factors of extrinsic incentives and efficacy training.

**results**

SmartPLS 4 is used to analyze the collected data. SmartPLS (Partial Least Squares Structural Equation Modeling) is a statistical analysis software tool commonly used in research particularly when dealing with complex research data. SmartPLS was chosen because it is robust with small sample sizes, which is very useful when researchers have a limited amount of data.

*Structural Model*

The Structural equation modelling (SEM) used to examine the structural relationships of the variables in this study.

A diagram of a work flow

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PLS-SEM measurement model (Source: Result analysis with SmartPLS 4)

*Path Coefficient*

Path coefficient analysis is a reliable statistical technique for categorizing correlation coefficients as direct or indirect effects. It assesses the interconnection of numerous yield relevant variables. Path coefficients are normally between -1 and +1 in terms of importance, with coefficients closer to -1 indicating strong negative correlations and those closer to +1 showing strong positive relationships. The data presented in this study appears to be related to a study or analysis that investigates the impact of motivation on employee performance in a corporation, with a particular emphasis on the role of extrinsic rewards and effectiveness training. These figures appear to be path coefficients, which are statistical metrics used in structural equation modelling to analyse the strength and direction of variables' interactions.

Structure Model Path Coefficient (Source: Result Analysis With Smartpls 4)

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From the result in Table I, the path coefficient between effectiveness training and employee motivation is 0.112, indicating a positive association. In other words, as the effectiveness of training increases, employee motivation tends to increase, but the effect is not very strong. Similarly, the path coefficient of 0.187 between effectiveness training and employee performance indicates a positive relationship between the two variables. As the quality of training increases, employee performance tends to improve. Again, this relationship is positive but relatively weak. However, effectiveness training appears to have a favourable but minor impact on employee motivation and performance.

While the coefficient is relatively large and positive, showing a strong and positive association between employee motivation and employee performance. When employee motivation rises, employee performance is more likely to improve dramatically. This demonstrates employee motivation has a significant positive impact on staff performance. Lastly is the relationship between extrinsic rewards and employee motivation. The coefficient of 0.855 suggests a very strong and positive relationship between extrinsic rewards (such as bonuses, promotions, or other external incentives) and employee motivation. When employees receive extrinsic rewards, their motivation is highly likely to increase significantly.

*Coefficient of Determination (R2)*

This statistic measures the proportion of the variance in the dependent variable (employee performance) that is explained by the independent variable (employee motivation) and any other variables included in the regression model.

R-square overview (Source: Result analysis with SmartPLS 4)

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From the result, R-square value of 0.926 indicates that approximately 92.6% of the variability in employee motivation can be explained by the independent variables in the regression model. For “Employee performance” R-square value is 0.839. This suggests that the mediator variable (employee motivation) and any other independent variables (extrinsic rewards and effectiveness training) in the model account for about 83.9% of the variance in employee performance. In other words, employee motivation is a strong predictor of employee performance, and the model is reasonably good at explaining observed changes in performance.

For "Employee Motivation," the R2 adjusted value is 92.4%. This somewhat lower number than R2 reflects the fact that the model includes independent variables, and it accounts for the potential overfitting that might occur when there are too many variables. While R2 adjusted is 83.5% for "Employee Performance," showing a comparable adjustment for the model's complexity in explaining employee performance.

*Path Coefficient through Bootstrapping*

Bootstrapping is a nonparametric approach that can be used to test the statistical significance of various path analysis and process outputs, such as path coefficients.

Path coefficients- mean, STDEV, T values, p values (Source: Result analysis with SmartPLS 4)

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Table III presented the summary of structural model, and the significant level was set at 0.05 (5%). The relationship between p-values and the t-statistic which demonstrates a small p-value (usually less than 0.05) suggests strong evidence that the null hypothesis is incorrect. In other words, a relatively tiny p-value indicates that the observed association between the variables is statistically significant. While a large p-value (greater than 0.05) indicates that there is little evidence to support the null hypothesis. If the p-value is high, it means that the observed association between the variables could have happened by chance, and there isn't enough statistical evidence to indicate a true relationship.

*Hypotheses Testing*

*H1: Management practices do not significantly affect employee motivation:* the p-value for the "Employee Motivation -> Employee Performance" association is 0.000, less than 0.05. Based on the data, this suggests that there is a significant relationship between employee motivation and employee performance, arguing against the null hypothesis. Therefore, null hypothesis is rejected.

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H1: Management practices do not significantly affect employee motivation

*H2: There is no significant relationship between Employee Motivation, Extrinsic Rewards, and Effectiveness:* there is significant effect of "Extrinsic Rewards -> Employee Motivation" relationship; the p- value is 0.000, which is less than 0.05. This also suggests strong evidence against the null hypothesis, implying a significant association between extrinsic rewards and employee motivation based on the data. Therefore, the effect of Extrinsic Rewards on Employee Motivation is "Supported" because the P-value is less than the typical significance level, indicating a statistically significant effect. However, the p-value for the relationship of "Effectiveness Training -> Employee Motivation" is 0.358, which is greater than 0.05. Based on the facts presented, this implies that there isn't enough evidence to establish that there is a significant association between effectiveness training and employee motivation. In other words, the effect of Effectiveness Training on Employee Motivation is "Unsupported" because the P-value is greater than the typical significance level (e.g., 0.05), indicating that there is no statistically significant effect. Training.

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H2: There is no significant relationship between Employee Motivation, Extrinsic Rewards, and Effectiveness Training

*H3: There is no significant Employee Motivation Mediates the Relationship between Extrinsic Rewards and Effectiveness Training on Employee Performance:* Employee motivation is critical to understanding the relationship between extrinsic rewards, training efficacy, and workplace performance. Determine whether employee motivation plays a substantial mediating function in this connection in this setting. According to Table 11, the relationship between effectiveness training and employee motivation shows that the impact size (0.112) is smaller than the sample mean (0.115), and the p-value (0.358) is bigger than the customary significance level (typically set at 0.05). This implies that training efficacy has an unsupported association with employee motivation, implying that training may not be a substantial driver of motivation in this specific circumstance. While the relationship between extrinsic rewards and employee motivation shows a substantial effect size (0.855) with a very low p-value (0.000), indicating a strong and supported relationship. This implies that extrinsic rewards significantly contribute to employee motivation. For this study, the association between employee motivation and employee performance shows a significant effect size (0.740) and an extremely low p-value (0.000), indicating a robust and supported relationship. This shows that motivated employees perform better regardless of the training they receive. According to the statistics, it appears that employee motivation plays a substantial role in moderating the relationship between extrinsic rewards and employee performance. Employee motivation is positively influenced by extrinsic rewards, and motivated employees tend to perform better. This is consistent with recognised organisational psychology theories such as Maslow's Hierarchy of Needs and Herzberg's Two-Factor Theory, which claim that external factors such as rewards can influence motivation, which in turn affects performance. However, the research does not demonstrate a direct relationship between training effectiveness and employee motivation or performance in this specific scenario. This shows that training alone may not be enough to increase motivation or improve performance without taking into account other elements such as extrinsic rewards. Further research may be required to investigate the interplay of these factors in greater depth in order to understand the full degree of employee motivation as a mediator. Furthermore, qualitative insights from employees and more contextual information about the organisation could provide a fuller understanding of the dynamics at work in this specific case.

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H3: There is no significant Employee Motivation Mediates the Relationship between Extrinsic Rewards and Effectiveness Training on Employee Performance

*H4: The Effectiveness Training do not significantly predict the Employee Performance level:* The analysis shows that Effectiveness Training is not a significant predictor of Employee Motivation, as the p-value (0.358) is bigger than the standard significance level (e.g., 0.05). This means that the association between Effectiveness Training and Employee Motivation is not statistically significant in this study. Similarly, the research demonstrates that Effectiveness Training is not a significant predictor of Employee Performance, as the p-value (0.177) above the conventional significance level. In contrast to the previous two relationships, Employee Motivation is determined to be a significant predictor of Employee Performance, since the p-value (0.000) is smaller than the specified significance level (e.g., 0.05). Therefore, the null hypothesis is accepted.

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H4: The Effectiveness Training do not significantly predict the Employee Performance level

**Conclusion**

The findings reveal a nuanced correlation between motivation, extrinsic rewards, and effectiveness training. Extrinsic rewards, including financial incentives, recognition, and benefits, play a significant role in enhancing short-term performance levels and fostering a sense of appreciation among employees. However, their sustained impact on long-term motivation and performance is contingent on complementing strategies such as effectiveness training. Training programs that equip employees with necessary skills, knowledge, and tools not only contribute to their motivation but also amplify the effects of extrinsic rewards by empowering individuals to utilize these incentives optimally.

Furthermore, the research identifies the importance of intrinsic motivation factors, such as job satisfaction, autonomy, and meaningful work, which can significantly influence sustained high performance beyond the scope of extrinsic rewards and training. The implications of this research are manifold for organizations aiming to optimize employee performance. By understanding the intricate relationship between extrinsic rewards, effectiveness training, and intrinsic motivators, companies can design holistic motivational strategies tailored to their workforce, thereby fostering an environment conducive to enhanced performance, increased job satisfaction, and long-term organizational success. The impact of motivation on employee performance, particularly when extrinsic rewards and effectiveness training are used within a corporation, has several important managerial consequences. For starters, it emphasizes the significance of a well-structured rewards system that is aligned with individual and organizational goals. Managers should create incentive programs that not only recognize and reward exceptional performance, but also cater to a wide range of employee preferences, ensuring that the incentives are meaningful to each individual. Additionally, the effectiveness of training programs in improving employee performance highlights the importance of ongoing learning and development initiatives. Managers should prioritize regular training and skill development opportunities to keep their employees current on industry developments and best practices. Furthermore, these training programs should be targeted to fill specific skill gaps while also aligning with the company's strategic goals. Furthermore, the mix of extrinsic rewards and training emphasizes the importance of a comprehensive approach to motivation. Managers must establish a balance between concrete benefits like bonuses and promotions and intangible rewards like recognition and opportunity for advancement. This method can help to develop a well-rounded incentive strategy that not only improves performance but also develops long-term employee engagement and loyalty.

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# Article 13: THE IMPACT OF EMPLOYEES TRAINING AND DEVELOPMENT ON ORGANIZATIONAL PERFORMANCE

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***Abstract*—** Employee training and development play a crucial role in enhancing organizational performance. For this reason, it is the responsibility of organizational leaders to comprehend the profound implications of training and development on various facets of organizational performance, including employee performance and productivity. Training and development serve as instrumental tools for both organizations and employees in accomplishing a diverse array of objectives. These encompass the elevation of morale, boosting employee engagement, and equipping individuals with the comprehensive competencies essential for the effective execution of their specific roles. In parallel, organizational leaders should employ systematic methodologies for evaluating employee productivity, with determinants stemming from personal attributes, organizational dynamics, environmental factors, motivation levels, skill proficiencies, aptitudes, and perceptions of one's role. Organizations can encourage their staff to effectively contribute to achieving a competitive edge in the modern global marketplace by offering training and development opportunities. On the other hand, organizations invest in employee training and development demonstrates their commitment to employee growth and success. This research investigation is dedicated to unravelling the impact of employee training and development on organizational performance. Moreover, it identifies the pivotal role of employee productivity as mediator factor in the relationship between training and development and organizational performance. The acknowledged significance of training and development in enhancing employee skills, knowledge, and job performance underscores the importance of aligning these initiatives with the overarching goals and strategic vision of the organization.

**Keywords— Employees, Training, Development, Organizational Performance, Employee Productivity, Employee Performance**

**Introduction**

The training and development was founded by Haunstien (1998) which is the objective and purposes are to improve the skills, knowledge, and abilities of employees so that they can perform their jobs better and contribute to the organization's goals and objectives. This can lead to increased productivity, higher quality work, and better customer service. Additionally, offering opportunities for career growth and advancement within the organization can help to motivate and retain talented employees, which is important for the organization's long-term success.

The problem of employee productivity is a significant concern for the successful organizational performances. Therefore, employees training and development is essential to enhance the performance of the employees as well as for organizational effectiveness. Effective training and development programs make the employees efficient, skilled and motivated which ultimately makes the organization success oriented.

Training and development has been identified as a potential solution to this problem, but there is a need for further understanding the specific impact of employees training and development on organization performance. While training is often used as a tool for improving employee productivity, it is unclear to what extent training actually leads to measurable improvements in performance. This is an important problem because organizations invest significant resources in training programs, and they need to be confident that these programs are effective in achieving their intended outcomes. Furthermore, if training is not effective, it can lead to a waste of time and resources, and may result in employee frustration and disengagement. Poor performance can lead to decreased productivity, reduced employee morale, and ultimately, lower organizational profitability. This problem is particularly relevant in today's rapidly changing work environment, where employees need to continually update their skills and knowledge to keep pace with technological and organizational changes.

According to statistical data from the Society for Human Resource Management (SHRM) found that 40% of employees who receive poor training and limited opportunities to develop their skills plan to leave their jobs within the first year highlights the crucial connection between training and development opportunities and employee retention. Employees may get dissatisfied and frustrated in their jobs if they do not receive appropriate training or opportunity to expand their knowledge and abilities. Employees may struggle to carry out their responsibilities effectively without the necessary training, which could undermine their confidence and reduce their sense of fulfilment at work. It can be demotivating for them to feel underappreciated and ill-equipped to handle their obligations. Additionally, providing chances for professional growth and promotion can boost employee dedication and loyalty to the company, resulting in improved retention rates.

It is crucial that any training and development initiatives are prompt, measurable, and applicable to the specific job requirements of the company. The training and staff development programs must aid individual performance to have a positive impact on the organizational performance in the short and long term. As asserted by Becker, Antuar, & Everett (2011), performance is associated with quantity of output, quality of output, timeless of output, presence or attendance on the completed and effectiveness of work completed. Otherwise, where manpower resources development of an organization is not given the appropriate attention, the implication could be poor organizational performance. The success or failure of any business depends on the quality of its human capital and, while it is widely recognized that training and development play important role, there are still many concerns as to which kinds of training, development and skills acquisition bring economic success.

Consequently, it becomes necessary to determine how organizational performance can be influenced through manpower training and development. Based on the information presented, it is important to establish the correlation between training, development, and employee productivity as a mediator role. The organizations can better understand how to design and implement training programs that are effective in improving employee performance and productivity and ultimately, contribute to the success of the organization. Therefore, to maximize the impact of employee training and development on organizational performance, organizations should design and implement training programs that are relevant, engaging, and aligned with business objectives, and ensure that employees are provided with the necessary resources and support to apply their new skills and knowledge on the job. This study has highlight that employee training and development as tool for enhancement of organizational performance, and employee productivity which could be outcome of training and development has been tested as mediator role in the relationship of training and development and organizational performance.

**literature review**

*Training and Development*

Training and development activities are important elements of the human resource management function of an organization. Training and development refers to the practice of providing training, workshops, coaching, mentoring, or other learning opportunities to inspire, challenge, and motivate employees to perform the functions of their position to the best of their ability and within standards set by local, state, federal and private organization.

Training is the most important component of human resource management when it comes to making the best use of human resources as they are an organization’s most important asset (Mahapatro, 2022). Training makes employees feel that they are part of the organization’s family; it creates the sense of belonging in all employees; it creates the professional development and enhances the employee’s skills; it also makes knowledgeable workforce with fewer mistakes. Vidyavihar (2019) state the training is a procedure that takes place over a brief length of time and employs a planned and ordered method, during which non-managerial workers or personnel acquire knowledge and abilities for certain reasons. It may occur in a variety of situations, either on- or off-the-job, and inside or outside the organization. Training enhances knowledge and information about a specific field as well as improves opportunities to network (Wang et al. 2021).

*Organizational Performance*

An organizational performance can be defined as the organization's ability to attain its goals by using human resources in an effective and efficient manner. Therefore, the performance of employees is a determining factor in the success or failure of a business organizational performance. According to Rothwell and Kazanas (2006), effective employee training yields numerous benefits, including the potential for a decrease in errors, leading to an increase in the quality of goods and services. An intelligent and well-trained workforce is crucial for both productivity and the triumph of an organization.

Organizational performance occurs when each person is focused on acquiring the necessary knowledge, enabling them to achieve the goals with the least amount of effort and resources permitted by the organization's standards. Long-term procedures that promote healthy behaviour inside the business and cooperative engagement from managers and employees are all part of organizational development. Organizational performance and development are strongly related; an effective organization cannot exist without a strong development strategy (Burhan et al., 2021).

*Employee Productivity*

Employee productivity (sometimes referred to as workforce productivity) is an assessment of the efficiency of a worker or group of workers. One way to measure productivity is by looking at an employee's production over a given time frame. A worker's productivity will typically be judged in comparison to the average of workers who perform similar tasks. Employee productivity is a crucial factor for organizations because it heavily depends on workforce productivity for any organization to be successful. Productivity can be defined as an overall measure of the ability to produce a good or service. More precisely, productivity refers to the management of specific resources to achieve timely objectives, measured in terms of both quantity and quality.

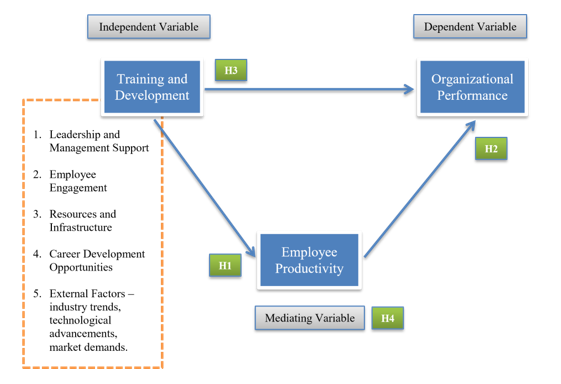
Nel et al. (2004) argue that training and development is the primary factor in the formation of employee human capital, which plays a critical role in determining long-term productivity through employee behaviour. In addition, Nankervis, Compton, and McCarthy (1999) suggest that effective training not only provides employees with the necessary knowledge and skills to complete their job duties, but also contributes to employee satisfaction and productivity, ultimately helping to achieve overall organizational objectives. A highly skilled, competent, flexible, effective, and well-trained workforce is essential to organizational performance, productivity, and success.

**research methodology**

This study utilized the survey research design method and quantitative approach is used. This study employs a mono-method approach, which means that the research choice revolves around using a single data collection method. In this case, the exclusive method chosen is the administration of a questionnaire to gather data for the research.

*Conceptual Framework*

The conceptual framework was developed based on the variables identified from the literature review.



Conceptual Framework

The conceptual framework for this study is based on the following theoretical assumptions and prior research: (1) Human capital theory: This theory suggests that investments in employee training and development can increase the human capital of the organization, leading to improved organizational performance (Becker, 1993); (2) Resource-based view theory: This theory proposes that employee productivity is a valuable resource that can give organizations a competitive advantage in the marketplace (Barney, 1991) and; (3) Mediation theory: This theory suggests that employee productivity may mediate the relationship between training and development and organizational performance, as employee productivity may be an important mechanism through which training and development impacts organizational performance (Baron & Kenny, 1986).

The conceptual framework proposes that training and development will have a positive effect on employee productivity, which in turn will have a positive effect on organizational performance. The proposed framework is based on the assumption that employee productivity is a key mechanism through which training and development impacts organizational performance.

*Data Analysis Method*

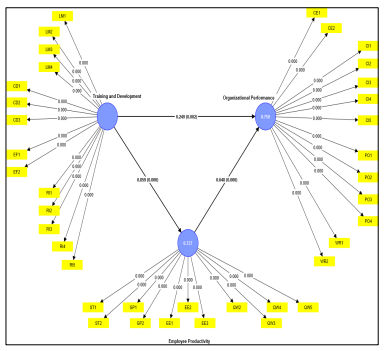
After being obtained through the use of questionnaires, the primary data will be analysed using the SMART PLS 4 software. Partial Least Squares Structural Equations Modelling (PLS-SEM) will be used as the selected statistical method to evaluate the model's outcomes. The choice of SMART PLS 4 software was made for its skills, particularly in developing reliability and validity results even with small sample sizes. Furthermore, the central limit theorem can also be used by SMART PLS 4 to correct anomalous data, optimising the determination coefficient while minimizing errors.

**results**

The raw data obtained in this study will be analyzed using several statistical tools. The statistical tools and interpretation of the results in quantitative data analysis will be using the SMART PLS 4. SMARTPLS is software with graphical user interface for variance-based Structural Equation Modelling (SEM) using the partial least squares (PLS) path modelling method.

*Structural Model*

The structural equation modelling (SEM) used in this study is illustrated in Fig. 2.



Structural Model for the current study (Source: Figure constructed by author using Smart PLS 4.0)

*P-value and Structural Model Path Coefficients*

The path coefficient was performed to estimate the structural model relationship which represents the hypothesized relationship among the constructs. Path coefficient represents estimated path relationships in the structural model. Path Coefficients is vital in accessing the true nature of cause-and-effect relationships between dependent and independent variable.

Structural Model Path Coefficients and the significance of each relationship (Source: Table constructed by Author using Smart PLS 4)

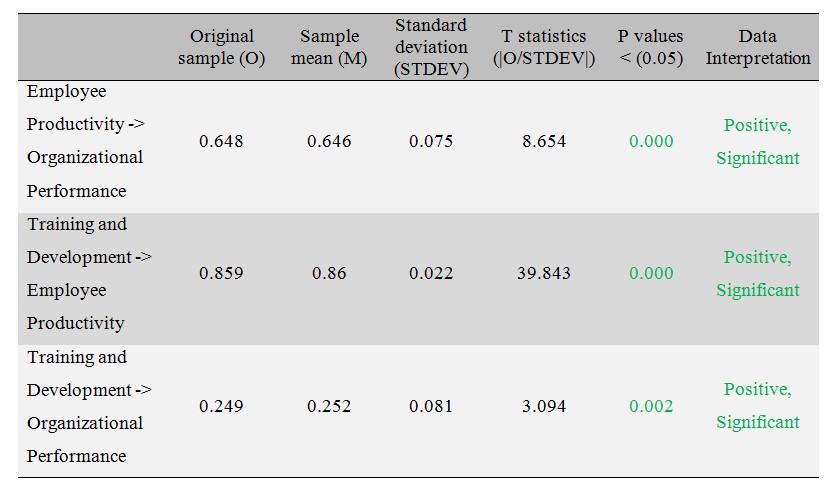


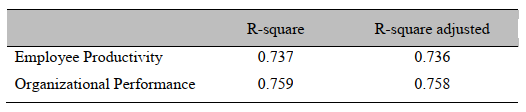
Table I presented the summary of structural model and the significant level was set at 0.05 (5%). This implies that when P-value is exceeded the significant level of 0.05, the result is unsupported. Based on the analysis in Table 4.10 provided, all path coefficients are positive and significant. Training and Development exerts the most substantial influence on Employee Productivity (0.859, p < 0.05). This underscores the statistical significance of the relationship between Training and Development and Employee Productivity. Moreover, this relationship is positive, implying that heightened Training and Development efforts generally coincide with increased Employee Productivity. Additionally, the relationship between Employee Productivity and Organizational Performance is statistically significant, as evidenced by the original sample value of 0.648 and a P-value less than 0.05. Not only is this relationship statistically significant, but it also demonstrates a positive relationship, indicating that an enhancement in Employee Productivity typically corresponds with an upswing in Organizational Performance. Furthermore, the P-value for the relationship between Training and Development and Organizational Performance (0.249) is also less than 0.05, underscoring its statistical significance. Despite the P-value being slightly elevated (0.002) in comparison to the earlier cases, it continues to provide strong evidence that intensified Training and Development efforts are associated with enhanced Organizational Performance.

In summary, all the relationships in this table are statistically significant (P-values < 0.05), and they are positively related. This means that changes or improvements in Employee Productivity and Training and Development are associated with positive changes in Organizational Performance.

*Coefficient of Determination (R2)*

Coefficient of determination, which is also known as R2 value, is most widely used measure to evaluate the predictive power of the structural model R2 value indicates the proportion of the variance in the dependent variable that is explained by linear regression and the independent variable. The coefficient of determination (R2) was used to measure the main model predictive power by exploring the effects of Training and Development -> Employee Productivity and Training and Development -> Organizational Performance.

R-square value for the current research study (Source: Table constructed by Author using Smart PLS 4.0)

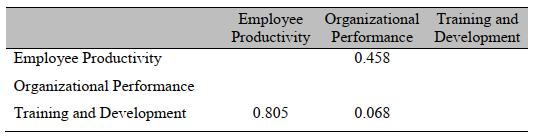


In the provided Table II, there are R-squared and R-squared adjusted values for two variables: Employee Productivity and Organizational Performance. These values serve as indicators of the goodness-of-fit for a regression model and can assist in evaluating the predictive accuracy of the model. The results reveal that the model explains 73.7% of the variance in Employee Productivity and 75.9% in Organizational Performance, signifying a high level of predictive accuracy. Larger values imply that a greater proportion of the variability is attributed to the independent variables, rendering the models more dependable for prediction and inference.

*Effect size (f2)*

The effect size f2 was tested to assess the rank order of each independent variable’s relevance in rank order in explaining the dependent variable. It is representing effect size of independent variables related to variance explained for the overall model. The effect size is examined to understand the magnitude of the difference between variables or the strength of the relationship and is not influenced by the sample size. This is unlike the P-value which provides results in statistically significant whether the findings are likely to be due to chance and the result more likely to be influenced by size of sample.

Effect Size value for each independent variable (Source: Table constructed by Author using Smart PLS 4.0)

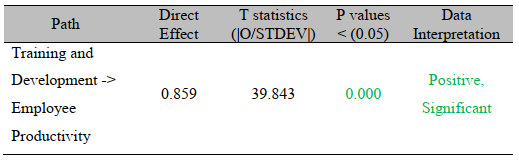


The findings presented in Table III reveal that with the exclusion of Training and Development it has minimal effect on Organizational Performance at 0.068. In contrast to Employee Productivity, this exhibits a large effect on Organizational Performance at 0.458. It's noteworthy that Employee Productivity serves as a mediating factor between Training and Development and Organizational Performance, exclusion of Training and Development will have large effect on Employee Productivity at 0.805.

*Hypotheses Testing*

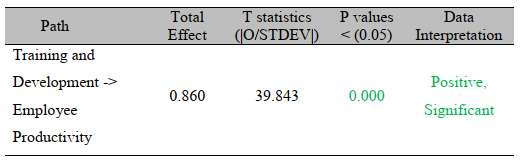
*H1: There is significant relationship between training and development and the enhancement of employee productivity:* the analysis aimed to assess the significance of both the direct and indirect effects in the association between "Training and Development" and "Employee Productivity." As illustrated in Table IV, the results indicate that "Training and Development" has a notably positive and statistically significant impact on "Employee Productivity." Specifically, the direct effect is estimated at 0.859, the associated t-statistic is a substantial 39.843, and the p-value < 0.005, all at a presumed 95% confidence level.

Direct Effect of Training and Development towards Employee Productivity Analysis (Source: Table constructed by Author using Smart PLS 4.0)



The study also examined the total effects, which include both the direct and indirect impacts of the relationship. These findings are presented in Table V. It is observed that the total effects are positive, registering at 0.860, with a t-statistic of 39.843 and a p-value < 0.05. This signifies a significant relevance of utilizing "Training and Development" to elucidate "Employee Productivity."

Total Effect of Training and Development towards Employee Productivity Analysis (Source: Table constructed by Author using Smart PLS 4.0)

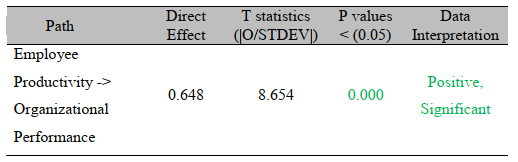


In statistical analysis, a high t-statistic indicates that the estimated effect is significantly different from zero and is highly unlikely to be due to random chance. In other words, it suggests a very strong and robust relationship between “Training and Development” and “Employee Productivity”. T-statistic as high as 39.843 would be considered very strong evidence of a significant relationship between the variables, assuming that the analysis was conducted correctly, and all underlying assumptions of the statistical test were met.

The results of a statistical analysis that shows a significant and positive relationship between “Training and Development” and “Employee Productivity”. The high t-statistic and very low p-value provide strong evidence for this relationship, implying that investments in training and development initiatives have a substantial and beneficial effect on enhancing employee productivity. Therefore, “Training and Development” had positive relationship with “Employee Productivity” (p <0.05) supporting Hypothesis 1 (H1). The “Training and Development” explained 73.7% of variation of “Employee Productivity” (R2 = 0.737).

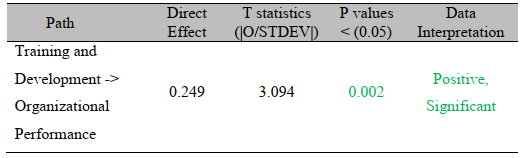
*H2: There is significant relationship between employee productivity and organizational performance:* Table VI illustrates that “Employee Productivity” exerts a robust and statistically significant influence on “Organizational Performance”, with a reported direct effect of 0.648. This numeric value signifies both the strength and direction of the relationship between these variables. The t-statistic, documented as 8.654, and a p-value of less than 0.005, indicating high statistical significance, reinforce the credibility of this relationship. A high t-statistic implies that the estimated effect significantly deviates from zero, while a p-value below the conventional 0.05 threshold underscores its statistical significance. In essence, a p-value is a metric that gauges the likelihood of obtaining a correlation coefficient as extreme as the one observed if the null hypothesis (H0) were true. A p-value lower than the significance level, typically set at p < 0.05, signifies that the relationship between “Employee Productivity” and “Organizational Performance” is statistically significant, allowing us to reject the null hypothesis (H0). Analyzing the calculated correlation coefficient and p-value, we can draw meaningful conclusions. When the correlation coefficient is not only positive but also statistically significant (i.e., p < 0.05), it strongly suggests a significant positive relationship between “Employee Productivity” and “Organizational Performance”, lending robust support alternative Hypothesis 2 (H2).

Direct Effects of Employee Productivity on Organizational Performance Analysis (Source: Table constructed by Author using Smart PLS 4.0)



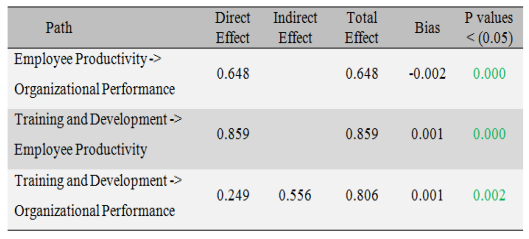
*H3: The effect of organizational performance depends on the impact of the training and development:* Table VII reveals a noteworthy relationship between "Training and Development" and "Organizational Performance." The direct effects, represented by a value of 0.249, elucidate both the strength and direction of this connection. A t-statistic of 3.094, indicating a relatively high value, signifies that the estimated effect significantly deviates from zero. Furthermore, a small p-value, specifically 0.002 (less than the common threshold of 0.05), underscores the statistical significance of this relationship. These findings collectively suggest that investments in training and development programs are strongly associated with enhancements in organizational performance, and this association is not likely due to random chance.

Direct Effect of Training and Development on Organizational Performance Analysis (Source: Table constructed by Author using Smart PLS 4.0)



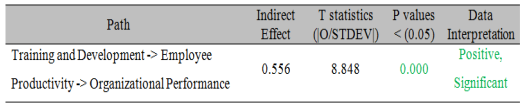
*H4: Employee productivity is significantly mediates relationship between the training and development and organizational performance:* Table VIII presents the result of the mediation analysis. The result show a direct effect of “Training and Development” and “Organizational Performance” (0.249, P < 0.005) before addition of the mediator. The simple mediation analysis revealed that “Training and Development” indirectly influences “Organizational Performance” through its impact on “Employee Productivity”, and the total effect after adding the indirect effect was (0.806, P < 0.001) show the significance of direct effects, “Employee Productivity” as the mediator, supporting the Hypothesis 4 (H4).

Mediation Analysis - The p-values for Direct and Indirect Effect between Variables (Source: Table constructed by Author using Smart PLS 4.0)



As illustrated in Table IX, the bias-corrected bootstrap confidence interval for the indirect effect, with a point estimate of 0.556 and a p-value less than 0.05 was found to not contain zero. This indicates that the indirect effect is statistically significant and provides evidence that the mediator variable plays a significant role in mediating the relationship between variables. For this particular study, it is concluded that the indirect effect analysis method is appropriate and robust for conducting mediation analysis.

Indirect Path Analysis (Source: Table constructed by Author using Smart PLS 4.0)



**Conclusion**

Employee training and development programs play a crucial role in enhancing the performance and productivity of organizations. Employee productivity acts as a mediator between employee training and development programs and organizational performance. Employees receive adequate training and development opportunities, and as a result, their skills and knowledge improve, leading to increased productivity levels. Consequently, this has a positive impact on the organization's overall performance. A study by Chen and Xin (2004) found that employee productivity partially mediates the relationship between training and development programs and organizational performance. They discovered that organizations with effective training and development programs experienced higher levels of employee productivity, which subsequently led to improved organizational outcomes.

Training and development initiatives must be in line with the organization's strategic goals and objectives if they are to have a meaningful impact on organisational performance. Performance is more significantly impacted when the knowledge and abilities gained via training are in line with the requirements of the organisation. While the positive impact of employee training and development on organizational performance is widely acknowledged, several factors can influence the magnitude of this impact.

Initiatives for training and development must have the support from leadership and management. The powerful example provided by leaders who actively support and participate in these programmes is one that the entire organisation can learn from. A culture of continuous learning is fostered by strong leadership support, in which workers see training as beneficial and essential for their development. Higher engagement and improved knowledge and skill retention follow from this. Leaders that stress the value of training motivate their teams to put time and effort into these initiatives. As a result, businesses with strong leadership support frequently receive greater returns on their training expenditures.

Employee engagement is another pivotal factor influencing the impact of training and development efforts. Engaged employees exhibit emotional commitment and motivation toward their work and the organization. They are more likely to embrace training and development opportunities as avenues for personal and professional growth. Engaged employees participate actively in training programs, absorb knowledge more effectively, and are willing to apply newly acquired skills in their roles. This heightened level of engagement positively impacts job performance, contributing to improved organizational performance.

Adequate resources and infrastructure are essential prerequisites for effective training and development programs. This includes financial resources for training materials, technology for e-learning and suitable physical facilities for in-person training sessions. Insufficient resources can lead to subpar training experiences and hinder employees' ability to acquire and apply new skills. As a result, organizations must ensure that they allocate sufficient resources to support their training and development initiatives. A well-funded and equipped training infrastructure enhances the overall effectiveness of these programs.

Employees are more likely to engage in training and development when they perceive clear career development opportunities within the organization. Providing avenues for employees to apply their newly acquired skills and advance in their careers is crucial. When employees see training as a pathway to career growth, they are motivated to participate actively in these programs. In addition, organizations that prioritize career development alongside training initiatives benefit from a skilled and motivated workforce. Such employees are more likely to contribute positively to the organization's performance, making it a win-win situation for both employees and the organization.

Finally, external factors such as industry trends, technological advancements, and changing market demands play a significant role in determining the relevance and effectiveness of training and development programs. Organizations must adapt their training initiatives to align with these external factors. Failure to adapt to industry changes can leave an organization with an out-dated workforce. Conversely, organizations that remain responsive to external changes through on-going training and development are better positioned to remain competitive and thrive in their industry.

In conclusion, the positive impact of employee training and development on organizational performance is unquestionable. However, the extent of this impact is influenced by several crucial factors, including leadership and management support, employee engagement, available resources, career development opportunities, and responsiveness to external factors. Organisations must give priority to these elements and establish a friendly, flexible, and stimulating learning environment if they want to fully reap the rewards of training and development.

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# Article no 14: THE IMPACT OF TRANSFORMATIONAL LEADERSHIP ON EMPLOYEE ENGAGEMENT IN MALAYSIA

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***Abstract*—** This research paper investigates the impact of Transformational Leadership on three dimensions of employee engagement: affective, cognitive, and behavioral, within the Malaysian context. Using an online questionnaire-based method, data was collected from 126 respondents. The results indicate a significant positive relationship between Transformational Leadership and the levels of employee engagement across all three dimensions. This study underscores the importance of Transformational Leadership practices in enhancing and cultivating a deeply engaged workforce in Malaysia.

**Keywords— Transformational Leadership, Affective, Cognitive, Behavioral**

**Introduction**

In today's competitive business environment, employee engagement has been identified as a pivotal factor influencing organizational success. Engaged employees have been linked with improved productivity, innovation, and reduced turnover, resulting in a tangible advantage for companies (Harter, Schmidt, & Hayes, 2002). Nevertheless, many organizations, particularly in Malaysia's culturally varied setting, struggle with reaching and maintaining high levels of engagement despite the obvious advantages of having an engaged workforce.

Transformational leadership, characterized by its inspirational and motivational qualities, has been posited as a potent tool to foster employee engagement (Bass & Riggio, 2006). While global studies have underscored this relationship, there is a noticeable gap in research focused specifically on the Malaysian context. Given Malaysia's unique blend of cultures, traditions, and business practices, it is unclear how the dynamics of transformational leadership interplay with employee engagement.

Moreover, while prominent Malaysian success stories like Grab and AirAsia emphasize the potential of transformational leadership, a comprehensive study that captures a wider spectrum of organizations and sectors within Malaysia is absent. Such a study is essential to determine if these successful instances are anomalies or if transformational leadership truly holds the key to heightened employee engagement across the board in Malaysia.

The lack of knowledge and clarity regarding the effect of transformative leadership on employee engagement in Malaysia's complex business ecosystem is thus the main issue that this research aims to solve. The goal of the research is to clarify this connection in order to offer organizations, leaders, and policymakers’ practical advice on how to use transformational leadership to boost employee engagement.

**literature review**

*Transformational Leadership*

Transformational leadership, a concept initially introduced by James V. Downton and later developed by Bernard M. Bass, is characterized by the ability of leaders to inspire and motivate their followers to exceed their own expectations and performance for the organization (Bass & Riggio, 2006). It primarily encompasses four dimensions: Idealized Influence (leaders as role models), Inspirational Motivation (inspiring a shared vision), Intellectual Stimulation (encouraging creativity and innovation), and Individualized Consideration (attending to individual needs).

*Employee Engagement*

Employee engagement, a multidimensional construct, represents the involvement, commitment, and enthusiasm employees exhibit towards their jobs (Kahn, 1990). A high level of engagement indicates that employees are not only satisfied with their jobs but are also invested in contributing positively towards the organization's goals. Kahn’s (1990) Personal Engagement Theory suggests that employees engage physically, cognitively, and emotionally at work only when they find meaning in their work, feel safe at work, and have enough personal resources at work to carry out their tasks. Psychological meaningfulness in the job is defined by skill variety, task autonomy, role status, role influence, dignified work relations; psychological safety is linked to not facing any negative consequences to self-image, status, or career; and psychological availability is associated with a sense of having the necessary physical, emotional, or psychological resources at work.

*Affective Engagement*

Affective engagement relates to the emotional bonds that employees form with their work and the organization (Macey & Schneider, 2008). Essentially, it emphasizes the feelings of enthusiasm, pride, and fulfilment associated with one's job. According to Macey & Schneider (2008), affective engagement shapes the emotional dimensions of one's involvement in the workplace. An employee who is affectively engaged experiences positive emotions, a profound sense of belonging, and a deep connection with their organization's mission and vision. This is not just about liking one's job, but also about resonating deeply with the organization's ethos, leading to a more profound and enriching work experience.

*Cognitive Engagement*

The concept of cognitive engagement is rooted in the idea of how employees think about their jobs and the broader goals of the organization. Schaufeli et al. (2002) posit that cognitively engaged employees not only understand their roles clearly but also perceive a strong alignment between their personal goals and the organization's objectives. Such alignment often leads to a heightened sense of ownership and responsibility. In their seminal research, Rich, Lepine, and Crawford (2010) suggest that cognitive engagement is characterized by vigor, dedication, and absorption. Vigor points to the levels of energy and mental resilience an employee displays, dedication refers to the levels of significance, enthusiasm, and challenge perceived in one's job, and absorption is the degree to which an employee is engrossed in their work. This deep-rooted focus often makes them lose track of time, indicating high levels of concentration and immersion.

*Behavioral Engagement*

Behavioral engagement serves as the outward expression of an individual’s intrinsic motivations and their alignment with organizational objectives. Saks (2006) articulates that behaviorally engaged employees demonstrate a higher level of initiative, exert additional effort in their tasks, and consistently go above and beyond their defined roles. This dimension of engagement stands as a testament to an employee’s commitment and dedication to their role and the organization at large. Furthermore, Macey & Schneider (2008) postulate that behaviorally engaged employees play a pivotal role in fostering a positive work environment. Their active participation, enthusiasm, and commitment often serve as a beacon for other employees, promoting a culture of excellence and collaborative spirit.

**research methodology**

The research utilised quantitative research method. Using an online questionnaire-based method, data was collected from 126 respondents.

*Theoretical Framework*

The theoretical framework is presented in Fig. 1.

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Theoretical Framework

*Data Analysis Method*

After collecting the primary data from the questionnaires, the data will be analyzed through the Smart PLS 4 software. Smart PLS 4 is a leading software application specifically designed for Partial Least Squares Structural Equation Modeling (PLSSEM), a method that allows researchers to examine complex interrelationships between observed and latent variables. Developed as an advancement from its preceding versions, Smart PLS 4 stands out for its user-friendly interface and ability to handle large datasets, making it particularly attractive for researchers working with primary data sourced from questionnaires.

**results**

The data gathered from the questionnaire are computed using SMART PLS 4 Software.

*Structural Model Path Coefficients*

PLS-SEM analysis was done on the path coefficient after the model's validity and dependability were assessed. One technique for looking at the structural model is the path coefficient. In this study, the standard deviations, T-statistics, and P-values are all evaluated using bootstrapping.

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Structural Model (Bootstrapping)

Fig. 2 presents the structural model of this study. This model is computed based on bootstrapping method, where it has bootstrapped up to 5000 samples.

Summary of Structural Model Path Coefficient

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The summary of the structural model was shown in Table I, and the significance level was selected at 0.05 (5%). This suggests that the result is unsupported when the P-value exceeds the significant level of 0.05. The provided table showcases the results of a statistical analysis evaluating the relationships between Transformational Leadership and three different types of engagement: Affective, Behavioral, and Cognitive.

For the relationship between Transformational Leadership and Affective Engagement, the sample mean is slightly higher at 0.569. With a standard deviation (STDEV) of 0.067, the T statistics—which is computed by dividing the original sample value by its standard deviation—amounts to 8.379. Intriguingly, the corresponding P value is 0. Such a low P value typically signifies that the observed relationship is statistically significant, indicating that Transformational Leadership likely has a notable influence on Affective Engagement.

For Behavioral Engagement, the relationship with Transformational Leadership yields an original sample coefficient of 0.494, with a marginally higher sample mean of 0.502. This relationship bears a standard deviation of 0.061, and a resulting T statistic of 8.13. Once again, the P value is recorded at 0, pointing to a statistically significant relationship. This implies a strong likelihood that Transformational Leadership has a discernible impact on Behavioral Engagement.

Lastly, for Cognitive Engagement, the association with Transformational Leadership results in a sample mean of 0.532, exhibiting a small variance from the original sample. The relationship's standard deviation measures at 0.063, culminating in a T statistic of 8.266. Mirroring the previous patterns, the P value for this relationship is also 0. This reinforces the notion that the relationship between Transformational Leadership and Cognitive Engagement is statistically significant.

In summary, the data suggests that Transformational Leadership holds a statistically significant influence over Affective, Behavioral, and Cognitive Engagements.

*Coefficient of Determination (R2)*

Table II delineates the R-square and R-square adjusted values for three distinct types of engagement: Affective, Behavioral, and Cognitive.

R-square Results

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Affective Engagement presents an R-square value of 0.317, suggesting that approximately 31.7% of the variance in Affective Engagement is explained by the independent variables in the model. However, it is essential to consider the R-square adjusted value, which considers the number of predictors in the model and offers a more precise measure. For Affective Engagement, the R-square adjusted value is 0.311, meaning that after adjusting for the number of predictors, about 31.1% of the variance is explained by the model. The slight reduction from the R-square value accounts for any potential inflation due to the addition of predictors.

Secondly for Behavioral Engagement, the R-square value is 0.244, indicating that the model explains around 24.4% of the variance in Behavioral Engagement. The R-square adjusted for this engagement type is 0.238, showcasing a slight decrement and implying that after adjusting for the predictors, the model elucidates approximately 23.8% of the variance.

Lastly, for Cognitive Engagement, the model presents an R-square value of 0.273. This suggests that the predictors in the model account for about 27.3% of the variance in Cognitive Engagement. Its R-square adjusted value is 0.268, revealing that after accounting for the number of predictors, the model clarifies nearly 26.8% of the variance in Cognitive Engagement.

In summation, the data provides insight into the explanatory power of independent variables over three types of engagement. While the R-square values offer a preliminary understanding, the R-square adjusted values provide a more nuanced and accurate representation, accounting for the number of predictors in the model. Among the three, Affective Engagement has the highest explained variance, followed by Cognitive Engagement, with Behavioral Engagement having the least.

*Effect Size*

The f2 (f-square) statistic is a measure used to assess the effect size in the context of structural equation modeling, specifically for path models.

Effect Size Results

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Looking into the provided data, we can interpret the effect sizes for the influence of Transformational Leadership on different forms of engagement:

Transformational Leadership -> Affective Engagement: With an f2 value of 0.463, the effect of Transformational Leadership on Affective Engagement can be classified as large. This suggests that Transformational Leadership plays a substantial role in explaining the variance in Affective Engagement, even after accounting for the influence of other potential predictors in the model.

Transformational Leadership -> Behavioral Engagement: The f2 value here is 0.323, falling into the medium effect size category. While still a considerable influence, the impact of Transformational Leadership on Behavioral Engagement is slightly less pronounced compared to its effect on Affective Engagement, but it remains significant.

Transformational Leadership -> Cognitive Engagement: Holding an f2 of 0.376, the effect of Transformational Leadership on Cognitive Engagement is between medium and large, leaning more towards a large effect. This means that Transformational Leadership is a potent predictor for Cognitive Engagement.

In summary, Transformational Leadership exhibits strong influence on all three forms of engagement, with the most pronounced effect on Affective Engagement, followed closely by Cognitive Engagement, and then Behavioral Engagement.

*Hypotheses Testing*

*H1: There is a significant impact of transformational leadership on affective engagement of employees in Malaysia:* With a resulting p-value of 0.000, the statistical evidence is overwhelmingly in favor of a significant association between transformational leadership and affective engagement in the Malaysian context. H1 is supported in this study. Bass and Riggio (2006) identified transformational leadership as a potent influencer in promoting motivation, morale, and performance outcomes among employees. Furthermore, a meta-analysis by Wang et al. (2011) discovered that transformational leadership was positively associated with employee task performance and organizational citizenship behavior, key facets of employee engagement. Given this compelling evidence, both from our study and the broader academic literature, it is evident that transformational leadership is a potent catalyst for fostering affective engagement, particularly in diverse cultural settings, possibly extending to regions like Malaysia. Thus, organizations operating within this region might benefit significantly from nurturing transformational leadership practices.

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H1: There is a significant impact of transformational leadership on affective engagement of employees in Malaysia

*H2: There is a significant impact of transformational leadership on cognitive engagement of employees in Malaysia:* Based on Fig. 4, the results of the study underscore a significant impact of transformational leadership on cognitive engagement of employees in Malaysia, as evidenced by the p value of 0.000.This is consistent with the wider literature on the subject. For instance, Bass (1985) elucidated the profound influence transformational leaders have on their followers, motivating them to perform beyond their perceived limits. More contemporary studies, such as Tims, Bakker, & Xanthopoulou (2011), have highlighted how these leaders can heighten daily work engagement, including cognitive engagement, by fostering a positive work environment. Furthermore, Zhu, Avolio, & Walumbwa (2009) posited that the individual characteristics of followers can either enhance or mitigate the positive effects of transformational leadership. Even outside Malaysia, the consistency in the correlation between transformational leadership and increased cognitive engagement suggests a universal trend. Macey & Schneider (2008) expanded on this by elucidating the intricate relationships between leadership styles and various facets of employee engagement, emphasizing the pivotal role transformational leadership plays across different cultural and organizational settings.

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H2: There is a significant impact of transformational leadership on cognitive engagement of employees in Malaysia

*H3: There is a significant impact of transformational leadership on behavioral engagement of employees in Malaysia: As shown in Fig. 5, the results supported H3, in which the value shows 0.000, lower than 0.05. This indicates that transformational leadership significantly affect the behavioral engagement of employees in Malaysia.* This finding resonates with existing literature. For instance, Judge & Piccolo (2004) consolidated various studies to reveal that transformational leadership often correlates with superior employee outcomes, including their behavioral engagement. Breevaart et al. (2014) took this discussion further, examining the daily interactions between supervisors and subordinates, noting a clear uptick in employees' behavioral engagement in the presence of transformational leadership. This is not a trend restricted to Malaysia. In a cross-cultural study, Den Hartog et al. (1999) illustrated that despite some variations based on cultural nuances, the essence of transformational leadership—motivating and inspiring employees— often translates into heightened behavioral engagement globally. In another broad sweep, Podsakoff et al. (1990) examined the mechanisms through which

transformational leaders affect employee outcomes, emphasizing behaviors such as role modeling that led to enhanced employee engagement.

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H3: There is a significant impact of transformational leadership on behavioral engagement of employees in Malaysia

**Conclusion**

In this study, there is a significant impact of transformational leadership on various forms of employee engagement in Malaysia, as supported by a p value of 0 for each of the engagements analyzed, namely affective engagement, cognitive engagement, and behavioral engagement.

The study shows that there is a significant positive impact of transformational leadership on employee engagement in the Malaysian context. However, potential implications might include:

Transformational leadership, which emphasizes inspiration, motivation, and the creation of a shared vision, proves to be a vital determinant of employee engagement in the Malaysian workplace context. Managers and leaders in Malaysian organizations should recognize the significance of this leadership style in enhancing employee motivation, commitment, and overall job satisfaction. By adopting transformational leadership strategies, such as articulating a compelling vision for the future, fostering a culture of innovation, recognizing individual employee contributions, and leading by example, organizations can foster an engaged workforce.

Furthermore, training and development programs should be geared towards equipping leaders with the skills and knowledge to practice transformational leadership. Given the cultural and societal nuances of Malaysia, it is essential for organizations to tailor their leadership development initiatives to resonate with local values and aspirations. Additionally, companies should focus on promoting open communication, encouraging feedback, and creating an environment where employees feel valued, understood, and part of the organization's bigger picture.

Lastly, organizational policies should reflect the emphasis on transformational leadership, and performance metrics should include assessments of leaders based on their ability to engage and inspire their teams. Recognizing and rewarding leaders who effectively employ transformational tactics could create a ripple effect, leading to higher levels of overall organizational engagement, productivity, and retention in the Malaysian business environment.

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# Article no 15:AN INVESTIGATION OF THE IMPACT OF TALENT MANAGEMENT, EMPLOYEE ENGAGEMENT, AND EMPLOYEE SATISFACTION ON EMPLOYEE RETENTION IN MALAYSIA INDUSTRIES

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***Abstract*—** This research project investigates the dynamics of employee retention within the framework of Malaysian industries, by evaluating the influence of three potential determinants – talent management, employee engagement, and employee satisfaction. In this study, online questionnaires were deployed via Google Forms, and the survey link was distributed to 101 respondents via social media platform. The convenience sampling technique, which is a type of non-probability sampling method was employed. Surprisingly, the findings revealed that while employee satisfaction and engagement played a pivotal role in enhancing employee retention rates, talent management strategies did not manifest a significant relationship. This insight contradicts prevalent notions that talent management directly correlates with retention. The study's outcomes suggest a need for Malaysian industries to recalibrate their HR strategies, placing emphasis on ensuring employee well-being and active engagement in their roles rather than solely focusing on talent management protocols. This research serves as a beacon for organizations aiming to optimize their workforce stability in a competitive market.

**Keywords—Talent management, Employee retention, Employee engagement, Employee satisfaction**

**Introduction**

In the global business landscape, talent management stands out as a cornerstone of organizational strategies. Its main goal is to enhance the processes of recruiting, nurturing, and holding onto high-caliber employees (Cappelli, 2008). However, talent management is but one piece of the puzzle. Complementary facets like employee engagement, which can be defined as a profound emotional and psychological connection to the organisation (Kahn, 1990), and employee satisfaction—the contentment derived from job roles and the working environment (Locke, 1976)—are equally pivotal. While these aspects individually and collectively influence organizational outcomes, their direct impact on employee retention, especially within the industrial sectors of Malaysia, requires deeper exploration. Malaysia, as a developing nation, has been aggressively pushing its industrial boundaries, positioning itself as a significant player in the global market.

This rapid industrial growth has driven a fierce competition for talent, especially in sectors such as technology, manufacturing, and finance. Consequently, Malaysia's industries face a double-edged challenge: attracting the right talent and, more importantly, retaining them (Ahmad & Bon, 2013).

Industries like technology, finance, and manufacturing in Malaysia have their unique set of challenges when it comes to talent retention (Mohd Noor & Dola, 2011). However, there is a discernible gap in the literature that offers a granular, industry-specific analysis. An understanding tailored to the nuances of each industry, as opposed to a generic approach, could offer more actionable insights to stakeholders.

Petronas has a strong focus on talent development, offering a range of learning and development programs to its employees. The company also has a talent management system in place to identify and develop high-potential employees. The former President and CEO Datuk Wan Zulkiflee Wan Ariffin, in 2015, announced that the company had spent about RM500 million on talent management across its 51,000 employees in previous years, in the aspects of leadership training and competency building. Meanwhile, the company also looked at the succession plans and employee development needs.

This emphasis on the talent management by Petronas was said due to the changing demographic landscape within the company – 55% of its’ employees were below the age of 35 (NST, 2015). As part of the talent management’s initiatives, CIMB Group Holdings Berhad has established the Future of Work Centre (FOWC) to equip its workforce with crucial digital skills to safeguard the group's future. The company aims to have a minimum of 15% of its employees possessing digital proficiency by 2023. FOWC also explored external placements to offer its employees exposure beyond the banking industry, motivating them to pursue novel prospects and adopt a more receptive approach while navigating their career trajectories (The Edge Markets, 2019).

Employee turnover, which refers to the rate at which employees leave an organization, can be detrimental. It leads to direct costs such as recruitment and training of new employees and indirect costs like loss of institutional knowledge and reduced morale among remaining employees (Holtom et al., 2008). Given the critical nature of the Malaysian industrial sector's growth trajectory, understanding the factors that impact employee retention is paramount.

In essence, while individual aspects of talent management, engagement, and satisfaction have been explored in global literature, their integrated impact on retention in Malaysia's industries remains a grey area. This research aims to shed light on these aspects, examining the interplay between talent management, employee engagement, satisfaction, and retention within the realm of Malaysia's industries.

**literature review**

*Talent Management Practices*

Talent management is regarded as a crucial HR challenge that businesses must address to meet future demands and ensure long-term sustainability. Failure to prioritize talent management can be catastrophic, especially in the current highly competitive business landscape. In today's talent-driven market, one of the most significant obstacles that organizations face is attracting, evaluating, training, and retaining talented employees. Talent management is a comprehensive process that involves planning, recruiting, developing, managing, and compensating employees across the entire organization (Hongal & Kinange, 2020). The impact of talent management practices on organizational performance in the IT industry was examined. The analysis revealed a positive relationship between talent management and overall organizational performance, although the impact is only partial. Employees suggested that improving learning and development initiatives and retention strategies could enhance talent management and ultimately lead to better organizational performance. Integrating talent management with business plans and strategies was said can improve performance, productivity, and profitability, giving organizations a competitive edge in the market (Puja & Shikha, 2022). A successful talent management could help to develop high employee performance which can be justified by the positive turnover in revenues and marketability of the well-developed talent (Syed Abd Nasir et al., 2014).

*Employee Retention*

The workforce's human capital is of utmost importance in the workplace and cannot be easily replaced. It poses a significant challenge to retain skilled and productive employees, particularly in a competitive job market. Effective management of human assets is a key factor in an organization's prosperity, and it is crucial to be mindful of it at all times. Therefore, it is essential for all positions within an organization, including human resource management, to collaborate and develop a retention strategy to help the organization become more competitive and advance in the future. Organisational performance can be adversely impacted by a high employee turnover rate, which can also prove to be a costly affair (Shaw et al., 2009). If an organisation fails to attract employees (Rakhra, 2018) and they were being dissatisfied, underpaid or unmotivated with the jobs (Coff, 1997) they are likely to leave. There was a four-parts model of turnover intentions proposed by (Mobley et al., 1978) with (1) Thinking of quitting; (2) Finding for acceptable alternative of employment; (3) Planning to quit or stay; and (4) Actual turnover. Once the employees have the thought of leaving, they will search for new opportunity. To decide to stay or leave is highly dependent on the next alternative employment. Once it has a better work-life condition than the existing one, they will leave and actual turnover happens (Hosen, 2022).

*Employee Engagement*

Employee engagement refers to the state of an employee being actively involved in, enthusiastic about, and satisfied with their work. It is crucial in retaining talent, as it significantly affects both employee productivity and talent retention. Highly engaged employees are known to produce superior outcomes as they possess a comprehensive understanding of the business context and work collaboratively with their colleagues at the workplace (Aizat Ramli et al., 2018). This is in parallel with another study concluded that highly committed employees try 57% harder on their task, perform 20% better, and 87% less likely to leave, manifesting the employee engagement is the key to their performance and employee retention (Corporate Leadership Council, 2004). Numerous studies and research have been carried out concerning the issue of employee engagement. The most influential factor in keeping employees engaged, according to all the studies conducted, is the "direct relation with manager” (Hongal & Kinange, 2020). Based on the empirical evidences, the relationship between talent management practices and employee engagement was proved to be positive (Aizat Ramli et al., 2018).

*Employee Satisfaction*

Employee satisfaction, referring to the level of contentment an employee experiences in their job, is a significant area of research in human resource management. It is also a pressing concern for companies worldwide. The reason for selecting job satisfaction as the predicted outcome of an employer brand is its close association with employee retention. When an organisation satisfies its employees, they are more likely to remain with the company and share their positive experiences with others, contributing to the organisation's reputation and success (Prasad, 2016). Employee satisfaction can foster employee commitment and customer satisfaction, ultimately resulting in improved organisational profitability (Gaddam, 2008). The implementation of talent management strategies has a positive and significant correlation with employee job satisfaction and performance. These strategies not only contribute to improved organizational outcomes but also have a significant impact on shaping employee attitudes. Providing opportunities for training, development, and career growth can increase employee motivation and discretionary behavior, ultimately resulting in job satisfaction. Jobs with greater potential for growth and advancement are likely to enhance employee performance. As a result, employees who experience higher levels of job satisfaction within their organizations are more productive and less likely to leave their jobs (NIKPOUR, 2018).

**research methodology**

In this study, a deductive research approach is utilized. Drawing from the independent variables – talent management, employee engagement and employee satisfaction, and the dependent variable – employee retention has been crafted to examine the interplay between these factors. In this research, data will be garnered using an online survey deployed via Google Forms. The questionnaire consists of close-ended questions. This method is not only cost-effective and time-saving but also eco-friendly. The data for this project will be collected from July 22, 2023 to September 6, 2023. The target population is the group of employees in Malaysia industries. Given the broad nature of industries in Malaysia, while defining the target population, it would also be crucial to consider factors like the type of industry (e.g., IT, manufacturing, finance), geographical location (urban vs. rural), and company culture (traditional vs. startup). It's essential to ensure that the sample represents the diversity of the Malaysian industrial landscape to draw comprehensive conclusions.

*Theoretical Framework*

The theoretical framework is presented in Fig. 1.

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Theoretical Framework

*Data Analysis Method*

Data analysis is a crucial stage in any research project as it facilitates the translation of raw data into meaningful insights. One of the modern tools used in research to conduct advanced analysis is the SMART PLS 4, which stands for "Smart Partial Least Squares." Upon gathering primary data from the questionnaires, it will be processed using the SMART PLS 4 software. The analysis will employ the Partial Least Squares Structural Equations Modelling (PLS-SEM) as the technique. Unlike other SEM techniques, PLS-SEM, as executed in SMART PLS 4, can handle smaller sample sizes and still provide reliable results.

**results**

Researcher use SMART PLS 4 Software to compute the data.

*Structural Model Path Coefficients*

Following an assessment of model validity and reliability, PLS-SEM analysis was conducted to examine the path coefficients, which is one of the techniques employed to investigate the structural model. In this research, bootstrapping was employed as a method to assess standard deviations, T-statistics, and P-values.

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Structural Model (Bootstrapping)

Fig. 2 illustrates the structural model utilized in this study. This model was generated using the bootstrapping technique, involving the generation of 5000 bootstrap samples.

Summary of Structural Model Path Coefficient

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Table I displays the summary of the structural model, with a significance level set at 0.05 (5%). The values of Original Sample (O) represent the data for each variable in the analysis. It appears to be the effect or score of each variable on Employee Retention. Employee Engagement has an original sample value of 0.426, while Employee Satisfaction has an original sample value of 0.512. Talent Management, however, has a negative original sample value of -0.062. On the other hand, the sample mean represents the average value of the data for each variable across your sample. In this case, the sample means for Employee Engagement, Employee Satisfaction, and Talent Management are 0.431, 0.509, and -0.063, respectively.

The spread or dispersion of the data points from the mean is measured by the Standard Deviation. A lower standard deviation indicates that the data points are close to the mean, while a higher standard deviation suggests that the data points are more spread out. In Table 4.5, the standard deviations for Employee Engagement, Employee Satisfaction, and Talent Management are 0.153, 0.126, and 0.100, respectively. Furthermore, the T statistics (or t-value) is a measure of how many standard deviations an original sample value is away from the sample mean. It is calculated as the absolute value of (Original Sample / Standard Deviation). A higher T statistic indicates a stronger relationship or effect. For Employee Engagement, the T statistic is 2.784, for Employee Satisfaction, the T statistic is 4.057, and for Talent Management, the T statistic is 0.641.

The p-values represent the significance of the relationships between each independent variable (Talent Management, Employee Engagement and Employee Satisfaction) and dependent variable (Employee Retention). In hypothesis testing, a small p-value (typically less than 0.05) indicates that the relationship between the variables is statistically significant, suggesting that the variable has an impact on Employee Retention. Conversely, a large p-value suggests that the relationship is not statistically significant. Previous research has demonstrated that if the P-value is less than 0.05, the model holds significance (Malhora & Peterson, 2006). Additionally, other studies have indicated that when the P-value is less than the 0.05 significance level, the relationship between the independent and dependent variables is considered significant (Uyanık & Güler, 2013). Based on the result shown in table 4.3, Employee Engagement and Employee Satisfaction have very low p-values (0.005 and 0.000, respectively), indicating a statistically significant relationship with Employee Retention. However, Talent Management has a relatively high p-value of 0.522, suggesting that its relationship with Employee Retention is not statistically significant in this analysis.

*Coefficient of Determination (R2)*

The coefficient of determination is a statistical metric used to evaluate the extent to which variations in one variable can be accounted for by differences in another variable when forecasting the result of a specific event.

R-Square results

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R-squared is a statistical measure that represents the proportion of the variance in the dependent variable (in this case, "Employee Retention") that is explained by the independent variables in the regression model. It ranges from 0 to 1, with higher values indicating a better fit of the model to the data. From the Table II, the R-squared value is 0.745, meaning that approximately 74.5% of the variance in "Employee Retention" can be explained by the independent variables included in the regression model. In other words, the model accounts for 74.5% of the variability in Employee Retention, and the remaining 25.5% is unexplained or attributed to other factors not considered in the model.

Another calculated item is Adjusted R-squared, which is a modification of R-squared that takes into account the number of independent variables in the model. It penalises the inclusion of irrelevant or redundant variables and provides a more accurate measure of the model's goodness of fit, especially when dealing with multiple independent variables. Adjusted R-squared, in this analysis, is 0.737. This adjusted value accounts for the complexity of the model by considering the number of independent variables. It is slightly lower than the R-squared value, as it penalizes the inclusion of unnecessary variables. The value of 0.737 manifests that about 73.7% of the variance in "Employee Retention" can be explained by the independent variables, adjusting for the model's complexity.

Based on past researches under discipline of marketing, the rule of thumb for R2 value of 0.25, 0.5, 0.75, represent weak, moderate, substantial respectively (Hair et al., 2011; Henseler et al., 2009). From table 4.6, these statistics indicate the goodness of fit of the regression model for predicting "Employee Retention." An R-squared value of 0.745 suggests that the model explains a substantial portion of the variance in Employee Retention, while the adjusted R-squared value of 0.737 provides a more conservative estimate of the model's performance, considering the complexity of the model. These values suggest that the model is relatively effective at explaining and predicting Employee Retention, but there may still be unexplained variability or room for improvement in the model..

*Hypotheses Testing*

*H1: Talent Management has significant influence on Employee Retention:* As shown in Fig. 3, this study does not provide support for H1, indicating that Talent Management is not a statistically significant factor influencing Employee Retention. This conclusion is drawn from the observed p value of 0.522, which exceeds the threshold of 0.05. The relationship between talent management and employee retention has been a topic of interest in organisational behavior and human resource management research.

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H1: Talent Management has significant influence on Employee Retention

*H2: Employee Engagement has significant influence on Employee Retention:* As depicted in Fig. 4, this study does provide support for H2, indicating that Employee Engagement is a statistically significant factor influencing Employee Retention. This conclusion is drawn from the observed p value of 0.005, which below the threshold of 0.05.The hypothesis which stated that employee engagement has a significant positive effect on employee retention was then accepted. Engaged employees exude enthusiasm, positivity, and proactivity, benefiting both themselves and the larger organisation.

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H2: Employee Engagement has significant influence on Employee Retention

*H3: Employee Engagement has significant influence on Employee Retention:* As shown in Fig. 5, this study does support to H3,suggesting that Employee Engagement is indeed a statistically significant factor impacting Employee Retention. This determination is based on the observed p value of 0.000, which falls below the 0.05 threshold.

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H3: Employee Engagement has significant influence on Employee Retention

**Conclusion**

Throughout the whole research, the study highlighted that while both employee engagement and employee satisfaction significantly influence employee retention, talent management, surprisingly, did not show a significant relationship. These findings challenge some commonly held perceptions, especially regarding the role of talent management in retention.

The emphasis on employee engagement and satisfaction resonates with the global shift towards understanding the importance of mental well-being, job satisfaction, and a sense of purpose in the workplace. In an era where industries are increasingly competing for top talent, these insights are invaluable for decision-makers and HR professionals within Malaysia.

In summary, this study not only contributes to the academic discourse on employee retention but also offers a tangible roadmap for industries in Malaysia, directing them towards areas that need attention and intervention. As the industrial landscape continues to evolve, such research becomes an indispensable tool in ensuring that businesses can retain their most crucial asset: their employees.

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# Article no 16: DETERMINING THE KEY FACTORS INFLUENCING PERFORMANCE IN THE BAKERY SECTOR FOR SMALL-MEDIUM ENTERPRISES (SMES) IN MALAYSIA

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***Abstract*—** This research explores the determinants of SME performance in Malaysia's bakery sector, focusing on entrepreneurial skills, marketing strategy, and government support. Employing a pragmatic research philosophy and deductive approach, it utilizes a survey method with non-probability convenience sampling of 101 respondents aged 20-50. Smart data analysis integrates demographic information for filtering. The paper outlines the research methodology, covering design, data collection, and analysis. Employing a quantitative research design, it measures variables related to entrepreneurial skills, marketing strategy, and government support, assessing their impact on bakery SME performance. Influenced by the "onion" research design, the methodology embraces layers crucial for a comprehensive study. Ethical considerations ensure participant confidentiality, informed consent, and voluntary participation. The discussion and conclusion provide insights into findings, with practical and theoretical recommendations. The researcher's reflection contributes insights for future research, emphasizing ethical practices and methodological considerations.

**Keywords— Performance Determinants, SME, Malaysian Bakery Sector, Entrepreneurial Skills, Marketing Strategy, Government Support**

**Introduction**

The operational success of small and medium-sized enterprises (SMEs) within the bakery sector in Malaysia faces a myriad of challenges emanating from both internal and external factors. Among these challenges, entrepreneurial skills, marketing strategies, and the adequacy of government support emerge as pivotal determinants influencing the overall landscape for these businesses. Despite their acknowledged significance, a substantial research problem persists due to a lack of clarity regarding the relative impact of these factors and the intricate interrelationships between them. Prior studies have individually underscored the importance of entrepreneurial skills, marketing strategies, and government support (Lee et al., 2022; Ng et al., 2020). However, the existing gap lies in comprehending how these elements interact and collectively contribute to the holistic performance of bakery SMEs in Malaysia.

The bakery sector in Malaysia stands as a crucial pillar of the nation's economy, playing a pivotal role in employment generation, fostering innovation, and driving overall economic growth. This industry encompasses a wide array of products, including bread, pastries, cakes, biscuits, and confectionaries, catering to diverse consumer preferences and cultural tastes. It benefits from Malaysia's rich culinary heritage and multicultural society, offering a blend of traditional flavours and modern innovations. Within the bakery sector, small and medium-sized enterprises (SMEs) hold particular significance, serving as the backbone of entrepreneurial activity and business development (Lim & Teoh, 2021). These SMEs contribute not only to economic growth but also demonstrate agility, adaptability, and innovation within the industry. They often specialize in niche products, cater to local tastes, and foster community engagement, contributing to the vibrancy and diversity of the bakery market.

Entrepreneurial skills, such as innovation, risk management, and resource allocation, are essential for SMEs to navigate the competitive bakery industry landscape (Tan et al., 2024). This gap can impede their ability to compete effectively in the bakery industry, innovate products, manage risks, and utilize resources optimally. Marketing strategies, including market positioning and branding, are crucial for building customer relationships and sustaining a competitive edge (Chou et al., 2020). SMEs in the bakery sector may struggle with developing and executing effective marketing strategies. Challenges may include inadequate market positioning, weak branding, and insufficient customer engagement efforts, resulting in limited market reach, reduced customer base, and diminished competitiveness. Furthermore, the extent of government support, encompassing financial assistance and regulatory frameworks, significantly influences the operational environment for bakery SMEs. Challenges such as complex application processes, stringent eligibility criteria, and bureaucratic obstacles can hinder SMEs' ability to leverage government support for business growth and sustainability.

Bakery SMEs operate in a highly competitive industry characterized by numerous established players and continuous innovation. SMEs may struggle to compete with larger bakery chains or well-established brands, particularly in terms of market penetration, product differentiation, and pricing competitiveness. Bakery SMEs often confront resource constraints, including limited access to capital, skilled labour, and advanced technology. These constraints can hinder their capacity to invest in innovation, upgrade equipment, or expand operations, thereby limiting their growth prospects and competitiveness in the market.

Therefore, this research aims to address these challenges by investigating the nuanced relationships between entrepreneurial skills, marketing strategies, and government support. By conducting an in-depth examination of these factors and their interconnectedness, the study seeks to provide evidence-based insights that are indispensable for enhancing the performance and sustainability of bakery SMEs in the complex business environment of Malaysia.

**literature review**

*Entrepreneurial Skills*

Entrepreneurial skills encompass a range of competencies and traits exhibited by business owners and managers, including innovation, risk-taking propensity, proactiveness, and strategic vision (Rauch & Hulsink, 2015). Understanding the influence of entrepreneurial skills on SME performance is crucial for identifying the entrepreneurial characteristics that drive success in the bakery industry. The study of entrepreneurial skills has its roots in the works of seminal scholars such as Schumpeter (1959) and Kirzner (1973), who highlighted the central role of entrepreneurship in driving economic development and innovation. Recent research on entrepreneurial skills has expanded to encompass not only individual-level competencies but also organizational aspects of entrepreneurship, such as entrepreneurial orientation and the fostering of an entrepreneurial culture within firms (Lumpkin & Dess, 1996).

*Marketing Strategy*

Marketing strategy refers to the overarching plan or approach adopted by a firm to effectively promote its products or services, differentiate itself from competitors, and achieve its business objectives (Kotler & Armstrong, 2018). Understanding the impact of marketing strategy on SME performance is crucial for identifying the strategies that drive success in the bakery industry. The study of marketing strategy has a long history, with early scholars such as McCarthy (1960) and Porter (1980) laying the groundwork for understanding the strategic dimensions of marketing. Recent developments in marketing strategy research have witnessed a shift towards more dynamic and integrated approaches to marketing strategy, reflecting the changing dynamics of consumer behaviour, technology, and competitive landscapes. Scholars have emphasized the importance of digital marketing, customer relationship management, and brand differentiation as essential elements of contemporary marketing strategies. The evolving nature of marketing strategy research reflects the adaptation of marketing practices to the modern business environment.

*Government Support*

Government support refers to the various forms of assistance, incentives, and policies provided by public authorities to promote the growth and competitiveness of SMEs, including financial support, regulatory frameworks, and capacity-building programs (North, 1990). Understanding the influence of government support on SME performance is crucial for identifying the role of public policy in shaping the business environment for bakery SMEs. The role of government in supporting SMEs has been a subject of interest for scholars and policymakers alike, with seminal works by Baumol (1990) and Scott (2006) highlighting the impact of institutional arrangements on entrepreneurship and small business development. Researchers have explored the impact of government interventions, financial incentives, regulatory frameworks, and business support services on SME performance and competitiveness. Recent developments in government support research have emphasized the need for targeted and responsive government support mechanisms that address the specific needs and challenges faced by SMEs in different industries. Scholars have highlighted the importance of entrepreneurial ecosystems, innovation clusters, and access to finance as critical elements of contemporary government support programs.

*SME Performance*

SME performance encompasses various aspects, including but not limited to financial performance, market share, growth rate, and overall competitiveness. Research on the performance of SMEs has a rich historical backdrop, with scholars such as Penrose (1959) emphasizing the role of firm-specific resources and capabilities in driving performance. Over the years, scholars have employed various performance measures and methodologies to understand, evaluate SME performance and aiming to identify the determinants and factors that contribute to their success or failure. Recent developments in SME performance research have seen a shift towards more comprehensive and multidimensional approaches to measure SME performance. Scholars have emphasized the importance of considering various aspects of performance, including financial indicators, market positioning, innovation, and sustainability. This shift reflects the growing complexity of SME operations and the need to capture a holistic view of their performance.

**research methodology**

The study focuses on three main factors: entrepreneurial skills, marketing strategy, and government support. Understanding and analysing these factors is essential for shedding light on the performance of SMEs in the bakery industry and identifying the most significant factor contributing to their success. In this study, a quantitative research design will be employed to measure the variables of entrepreneurial skills, marketing strategy, and government support and their impact on the performance of SMEs in the bakery sector in Malaysia.

*Conceptual Framework*

The conceptual framework revolves around the dependent and independent variables.

A diagram of performance indicators

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Conceptual Framework

*Data Analysis Method*

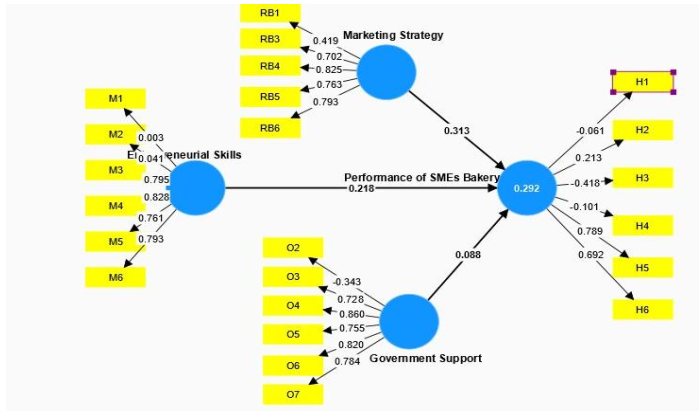
When it comes to research and data analysis, using sophisticated instruments is essential for thorough and perceptive studies. We use SmartPLS 4 Software in this investigation, a powerful tool designed for path modelling and structural equation modelling (SEM). SmartPLS 4, which is well-known for its effectiveness, enables researchers to evaluate theoretical models, identify cause-and-effect links among variables, and traverse complex interactions within datasets. Because of its adaptability, it may be used for a wide range of research initiatives, especially in fields like business and the social sciences.

**results**

Through the utilization of SmartPLS 4, this study aims to generate reliable and valid findings that contribute to the existing body of knowledge on SME performance in the bakery industry.

*Structural Model*

PLS-SEM aims to maximize the variance of the dependent variable to evaluate the predictive capabilities of the model. This meticulous procedure is essential for verifying the validity and dependability of the study's findings before exploring complex relationships. In this section, PLS-SEM model assessment will first be focusing on the measurement model to evaluate the reliability and validity of the construct measures. The analysis and results section that follows seeks to shed light on the nuances and implications that resulted from the PLS-SEM analysis, thereby advancing a thorough comprehension of the structural dynamics of the study.



PLS-SEM Model

*R-Square*

The presented data provides R-square and R-square adjusted values for the variable "Performance of SMEs Bakery." These coefficients are key metrics in regression analysis, indicating the proportion of variability in the dependent variable (SMEs bakery performance, in this case) that is explained by the independent variables included in the model.

R-Square

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The R-square value of 0.292 suggests that approximately 29.2% of the variability in SMEs bakery performance can be accounted for by the variables considered in the regression model. The R-square adjusted value, slightly lower at 0.27, adjusts the R-square to account for the number of predictors in the model, offering a more conservative estimate of the model's generalization to new data. Both values collectively provide valuable insights into the goodness-of-fit of the regression model, indicating the degree to which the chosen independent variables contribute to explaining the observed variations in the performance of small and medium-sized enterprises in the bakery sector.

The R-Square value of 0.292 suggests that approximately 29.2% of the variability in the performance of small and medium-sized enterprises (SMEs) in the bakery sector is explained by the factors considered in the regression model. The Adjusted R-Square, slightly lower at 0.27, adjusts this value to account for the number of predictors in the model, providing a more conservative estimate of the model's generalization to new data. These values collectively indicate a moderate level of explanatory power, implying that the chosen independent variables contribute to understanding a significant portion of the observed variations in bakery performance. While the model may not capture all factors influencing performance, the identified predictors play a meaningful role. The findings have implications for stakeholders and decision-makers in the bakery industry, providing insights into key factors affecting SMEs' performance and potentially guiding strategies for improvement.

Despite the insights provided by the R-Square and Adjusted R-Square values, it's important to acknowledge the limitations of the regression model. The explanatory power, while moderate, indicates that there are unaccounted-for factors influencing SMEs bakery performance. The model might benefit from the inclusion of additional relevant variables that were not considered in the current analysis. Moreover, the observed R-Square adjusted value suggests that the model's generalization to new data might be somewhat constrained. Future research could explore potential sources of variability that were not captured in the current model or consider alternative modeling techniques. Additionally, external factors such as market dynamics, economic conditions, or technological advancements could be important considerations that are beyond the scope of the current model. Therefore, cautious interpretation and consideration of these limitations are essential for a comprehensive understanding of SMEs bakery performance, and further research could refine and expand upon the current findings.

*F Square*

The presented data consists of f-square values, each representing the effect size of specific predictor variables on the dependent variable "Performance of SMEs Bakery."

F Square

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These coefficients quantify the proportion of variance in SMEs bakery performance that can be uniquely attributed to each independent variable, beyond any shared variance with other predictors. For example, the f-square value of 0.034 for "Entrepreneurial Skills" suggests that approximately 3.4% of the variability in the performance of small and medium-sized enterprises (SMEs) in the bakery sector can be explained by entrepreneurial skills when considered independently. Similarly, the values of 0.008 for "Government Support" and 0.07 for "Marketing Strategy" signify the unique contribution of each of these factors to explaining the variance in SMEs bakery performance. These f-square values provide a quantitative measure of the individual impact of specific predictors, aiding in the understanding of their relative importance in influencing the observed outcomes in the context of SMEs in the bakery industry.

*Path Coefficients*

The provided data represents path coefficients, which are standardized regression coefficients in a structural equation model, indicating the strength and direction of the relationships between independent variables and the dependent variable. In this context, the path coefficients show the impact of each predictor variable on the "Performance of SMEs Bakery."

Path coefficient

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For "Entrepreneurial Skills," the path coefficient is 0.218, suggesting a positive relationship between entrepreneurial skills and SMEs bakery performance. Specifically, a one-unit increase in entrepreneurial skills is associated with a 0.218-unit increase in the predicted performance of SMEs in the bakery sector.

For "Government Support," the path coefficient is 0.088, indicating a positive but smaller relationship. A one-unit increase in government support is associated with a 0.088unit increase in the predicted performance of SMEs in the bakery sector.

Lastly, for "Marketing Strategy," the path coefficient is 0.313, indicating a stronger positive relationship. A one-unit increase in marketing strategy is associated with a 0.313unit increase in the predicted performance of SMEs in the bakery sector.

In summary, these path coefficients quantify the standardized impact of each predictor on the performance of SMEs in the bakery industry, providing insights into the relative importance and direction of these relationships within the structural equation model.

*P Values*

In the provided data, the p-values associated with each predictor variable (Entrepreneurial Skills, Government Support, and Marketing Strategy) play a crucial role in hypothesis testing. These p-values indicate the probability of observing the reported T statistics (|O/STDEV|) or more extreme values under the assumption that there is no true effect of the predictor variable on the Performance of SMEs Bakery.

Summary of P Values

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*Entrepreneurial Skills -> Performance of SMEs Bakery:* The p-value of 0.121 suggests a 12.1% probability of observing a T statistic as extreme as 1.552, assuming there is no genuine effect of Entrepreneurial Skills on the Performance of SMEs Bakery. With a p-value higher than the conventional significance level of 0.05, there may not be enough evidence to reject the null hypothesis. The observed relationship may not be statistically significant.

*Government Support -> Performance of SMEs Bakery:* The p-value of 0.417 indicates a 41.7% probability of observing a T statistic as extreme as 0.812, assuming there is no true effect of Government Support on the Performance of SMEs Bakery. With a p-value greater than 0.05, there may not be sufficient evidence to reject the null hypothesis. The observed relationship may not be statistically significant.

*Marketing Strategy -> Performance of SMEs Bakery:* The p-value of 0.029 implies a 2.9% probability of observing a T statistic as extreme as 2.189, assuming there is no genuine effect of Marketing Strategy on the Performance of SMEs Bakery. With a p-value less than 0.05, there is evidence to reject the null hypothesis. The observed relationship may be statistically significant.

In summary, the p-values help assess the statistical significance of the observed relationships. A lower p-value indicates stronger evidence against the null hypothesis, suggesting that the observed effects are more likely to be real and not due to random chance. Researchers often use a significance level, such as 0.05, to make decisions about the statistical significance of their findings.

**Conclusion**

Focused on unraveling the intricacies of SME performance in the Malaysian bakery sector, this study delves into three core factors: entrepreneurial skills, marketing strategy, and government support. Through theoretical exploration, the research aims to shed light on the interplay of these variables and their impact on SME success. The methodology, grounded in pragmatism, adopts a deductive approach, utilizing a survey-based design that is exclusively quantitative and cross-sectional. Employing a non-probability convenience technique, data will be collected from 101 respondents aged 20-50 working in Malaysia. The survey, designed for both online and offline distribution, incorporates demographic inquiries to filter and ensure statistical significance. The p-values associated with predictor variables (Entrepreneurial Skills, Government Support, and Marketing Strategy) in the collected data will play a pivotal role in hypothesis testing, offering insights into the true effects of these factors on SME performance in the bakery sector. The study seeks to not only comprehend the dynamics of SMEs but also contribute valuable insights for industry stakeholders and policymakers alike.

Practical recommendations stemming from our research on the performance of small-medium enterprises (SMEs) in the Malaysian bakery sector focus on enhancing entrepreneurial skills, leveraging government support, and refining marketing strategies. To bolster entrepreneurial skills, SME owners and managers should invest in continuous training programs and workshops aimed at fostering innovation, leadership, and adaptability within their workforce. Collaboration with government agencies is crucial for SMEs to navigate regulatory frameworks and avail themselves of financial incentives and support programs. These programs could include hands-on sessions on product development, financial management, and customer relationship management.

Theoretical recommendations center on the refinement of existing entrepreneurial, governmental, and marketing theories to better encapsulate the nuances of the bakery industry. Scholars should explore interdisciplinary perspectives, incorporating insights from economics, psychology, and management to develop a holistic understanding of SME dynamics. Moreover, integrating cultural and contextual factors into established marketing and entrepreneurial theories can enrich their applicability within the unique Malaysian bakery context (Shane & Venkataraman, 2000). This could involve conducting qualitative studies to understand consumer preferences, cultural influences on purchasing behavior, and market trends specific to the bakery industry in Malaysia.

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# Article no 17:THE INCREASING ADOPTION OF ELECTRIC VEHICLES (EVs)

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***Abstract*—**The increasing adoption of electric vehicles (EVs) holds great promise for sustainable transportation, but it also poses significant challenges related to the strain on the electricity grid. This literature review explores the impact of EV adoption on the electricity grid and the measures required for a sustainable and efficient transition to EVs. The research context highlights the rapid growth of EVs globally and the potential strain on the grid due to their increasing demand for electricity. The problem statement emphasizes the need to address this issue comprehensively to avoid disruptions and ensure a smooth transition. The research gap analysis identifies the need for in-depth studies on grid management strategies and the integration of renewable energy sources and smart grid technologies. The study's objectives are to assess the drivers of EV adoption, examine the relationship between sustainable transportation and EV transition, assess grid strain's effects, and explore perceived impacts. This research contributes valuable insights to policymakers, utility companies, and stakeholders working towards sustainable EV adoption and grid management.

**Keywords—Electric Vehicles, Sustainable Transportation, Smart Grid Technologies**

**Introduction**

Electric vehicles (EVs) have gained significant attention as an alternative to conventional gasoline-powered vehicles due to their potential to reduce greenhouse gas emissions and improve air quality (Nguyen et al., 2020). The increasing adoption of EVs is driven by the need for more sustainable transportation, but it has led to potential strain on the electricity grid, particularly during peak hours (Peng et al., 2018). This issue has been present since the early adoption of EVs and is important to manage for a sustainable and efficient transition to EVs. In this literature review, we will explore the impact of the increasing adoption of EVs on the electricity grid and the measures that can be taken to manage this impact for a sustainable and efficient transition to EVs.

According to the International Energy Agency's Global EV Outlook 2021 report, the global electric car stock reached over 10 million in 2020, representing a 41% increase from 2019. This indicates a significant increase in the uptake of EVs over the past few years. Nevertheless, petrol and diesel cars still dominate the global car market, accounting for over 95% of global passenger car sales in 2020 (IEA, 2021).

The increasing adoption of electric vehicles (EVs) has been driven by the need for more sustainable transportation. The transportation sector is a significant contributor to greenhouse gas emissions, and the shift to electric vehicles is seen as one of the most promising ways to reduce these emissions. The International Energy Agency (IEA) predicts that the number of electric cars on the road worldwide will reach 145 million by 2030, up from 11 million in 2020 (IEA, 2020).

However, the increasing adoption of EVs has led to a potential strain on the electricity grid. As more and more people switch to electric vehicles, the demand for electricity to power these vehicles will increase, and this can lead to issues such as blackouts or brownouts in areas where the grid is already under strain. In addition, the charging of electric vehicles can cause a surge in electricity demand, which can be challenging for utilities to manage. This issue started since the early adoption of EVs, and it is important to manage it for a sustainable and efficient transition to EVs.

The potential strain on the electricity grid is a significant issue, as it threatens the ability of electric vehicles to deliver on their promise of sustainable transportation. It is essential to address this issue to ensure that the transition to electric vehicles is sustainable and efficient. One potential solution to this issue is the use of smart charging, which can help to manage the demand for electricity from electric vehicles. Smart charging involves using software and other technologies to control when and how electric vehicles are charged, to ensure that the charging process is spread out and does not put too much strain on the electricity grid (IEA, 2021).

Another solution is the use of renewable energy sources to power electric vehicles. The use of renewable energy sources such as solar or wind power to generate electricity for electric vehicles can help to reduce the strain on the electricity grid, as well as further reducing greenhouse gas emissions. In addition, the use of renewable energy sources can help to make electric vehicles even more sustainable, by ensuring that the electricity used to power them is itself produced sustainably.

The increasing adoption of electric vehicles is a crucial step in the transition towards more sustainable transportation, however, this adoption has led to a potential strain on the electricity grid, which threatens the ability of electric vehicles to deliver on their promise of sustainable transportation. It is important to manage this issue for a sustainable and efficient transition to electric vehicles.

Therefore, it is critical to continue researching this issue and developing effective solutions to ensure a sustainable and efficient transition to EVs, particularly in terms of charging infrastructure and grid capacity. By analysing the current state of EV charging infrastructure and the electricity grid's capacity, this study will identify potential gaps and opportunities for improvement. The findings from this research could provide valuable insights into how to manage the usage of EVs for a sustainable and efficient transition to EVs.

**literature review**

*EV Adoption on the Electricity Grid*

The transition from traditional gasoline-powered vehicles to electric vehicles (EVs) is driven Research indicates that the increasing adoption of EVs is a global phenomenon with significant implications for the electricity grid. Nguyen et al. (2020) emphasize the role of EVs in reducing greenhouse gas emissions, but they also highlight the need to address challenges related to grid capacity and reliability. As the number of EVs on the road rises, there is a growing concern about the grid's ability to handle the increased demand for electricity, particularly during peak charging times (Peng et al., 2018).

*Behavioral Intention*

Consumer behavioural intention to adopt EVs is influenced by various factors, including environmental consciousness, economic considerations, and convenience (Mehdizadeh et al., 2024). Positive attitudes toward EVs, perceptions of reduced operational costs, and the desire to contribute to environmental sustainability are key drivers of consumer intention (Sierzchula et al., 2014). A critical aspect of consumer behavioural intention relates to charging patterns. Research has shown that consumers are more likely to charge their EVs during off-peak hours if offered incentives or if they perceive cost savings (Liu et al., 2019). Behavioural intention to adopt smart charging practices is influenced by factors such as tariff structures, public charging infrastructure, and information availability (Yang et al., 2017).

Companies specializing in EV charging infrastructure and smart grid technologies have a behavioural intention to develop and market innovative solutions that encourage off-peak charging. Their aim is to provide convenient and cost-effective charging options for EV users (Sanchez-García et al., 2022). Industry stakeholders often collaborate with governments and research institutions to advance technologies and policies that support grid-friendly EV charging. Their behavioural intention is driven by the potential market for EV-related products and services (Nelder & Rogers, 2019).

**research methodology**

In this research, the quantitative approach was chosen to precisely measure variables, identify patterns, and statistically test hypotheses concerning electric vehicle adoption and its impact on the electricity grid, aligning with the study's objectives and the need for numerical data analysis. An online survey will be employed to gather data from the target participants. Questionnaires will be created using Google Forms for data collection. The choice of an electronic survey for this study is based on its recognized convenience and efficiency as a data collection method. The online survey will be distributed to a total of 386 respondents through various online platforms, including WhatsApp, Facebook Groups, Instagram and interest groups. The questionnaire is structured into 5 sections: Section 1 focuses on gathering demographic information from the participants, while Section 2 to 5 are designed to assess all four variables. All items will be rated using a five-point Likert scale, with responses ranging from one to five (1=Strongly Disagree, 5=Strongly Agree).

*Conceptual Framework*

The conceptual framework outlined in Fig. 1 revolves around the sustainable and efficient transition to electric vehicles (EVs) and the key factors that influence this transition.

A diagram of a graph

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Conceptual Framework

The independent variables of the study are the increasing adoption of EVs, the need for sustainable transportation and the potential strain on the electricity grid. In other hand, the dependent variable of the study is the sustainable and efficient transition to EVs.

*Data Analysis Method*

Following the collection of primary data via the questionnaires, the data will undergo analysis using SMART PLS 4 software. To scrutinize the model's outcomes, Partial Least Squares Structural Equations Modelling (PLS-SEM) will be the chosen analytical approach. The rationale behind opting for SMART PLS 4 software lies in its capability to establish reliability and validity results effectively, even with relatively small sample sizes. Additionally, SMART PLS 4 has the capacity to adjust for abnormal data using the central limit theorem, thereby maximizing the R-squared value and minimizing errors in the analysis.

**results**

The data gathered through the questionnaire will undergo thorough analysis and interpretation. The SMART PLS 4 Software will be utilized for data computation.

*Structural Model*

In Partial Least Squares (PLS) structural modeling, path coefficients represent the strength and direction of the relationships between latent constructs (variables). These coefficients quantify the extent to which a one-unit change in the independent variable affects the dependent variable, considering the underlying measurement model. PLS path coefficients are used to assess the structural relationships within the model and provide insights into the causal or predictive connections between latent constructs.

Fig. 2 presented the structural model of this study. This model is computed based on bootstrapping method, where it has bootstrapped to 5000 samples.

A diagram of a flowchart

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Structural Model (Bootstrapping)

*Path Coefficient*

Table I provides information about the path coefficients, their relationship to the sample mean, their variability (standard deviation), their significance (T statistics), and their statistical significance (P-values) for three different relationships between independent variables and the dependent variable.

Path Coefficients (Bootstrapping)

A screenshot of a test

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*Original Sample (O):* This column contains the actual values of the path coefficients for three different relationships between independent variables (IV1, IV2, IV3) and the dependent variable (DV4-sustainable and\_efficient transition). Each row corresponds to a different relationship, and the values in this column represent the strength and direction of these relationships as observed in your data. For the first relationship (IV1 -> DV4), the original sample coefficient is 0.183. For the second relationship (IV2 -> DV4), the original sample coefficient is 0.601. For the third relationship (IV3 -> DV4), the original sample coefficient is 0.158.

*Sample Mean (M):* This column contains the mean or average values of the path coefficients for the same relationships. It gives you an idea of what the expected or typical values for these coefficients might be in the population. For the first relationship (IV1 -> DV4), the sample mean coefficient is 0.186. For the second relationship (IV2 -> DV4), the sample mean coefficient is 0.598. For the third relationship (IV3 -> DV4), the sample mean coefficient is 0.164.

*Standard Deviation (STDEV):* This column represents the standard deviation of the path coefficients for these relationships. The standard deviation is a measure of how much the coefficients vary or spread out from the mean. Smaller standard deviations suggest that the data points are clustered closely around the mean, while larger standard deviations indicate more dispersion. For all three relationships, the standard deviation is 0.03. This suggests that the data points for these coefficients are relatively close to the mean.

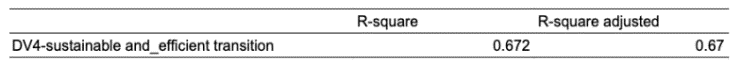
*T Statistics (|O/STDEV|):* T statistics are calculated by dividing the absolute value of the original sample coefficient (O) by the standard deviation (STDEV). T statistics tell you how many standard deviations the original sample coefficient is away from the mean. - For the first relationship (IV1 -> DV4), the T statistic is calculated as 0.183 / 0.047 ≈ 3.86. For the second relationship (IV2 -> DV4), the T statistic is calculated as 0.601 / 0.03 ≈ 20.198. For the third relationship (IV3 -> DV4), the T statistic is calculated as 0.158 / 0.03 ≈ 5.198. These T statistics are measures of the significance of the coefficients. Larger T statistics indicate that the coefficient is significantly different from zero.

*P Values:* The P-values are associated with the T statistics and are used to assess the statistical significance of the relationships. In all three cases, the P-values are listed as 0. This typically suggests that the relationships between the independent variables (IV1, IV2, IV3) and the dependent variable (DV4) are statistically significant. A P-value of 0 indicates that the observed results are highly unlikely to have occurred by chance.

*Coefficient of Determination (R2)*

The Coefficient of Determination (R-squared or R2) is a statistical measure that quantifies the proportion of the variance in the dependent variable that is explained by the independent variables in a regression model. It is expressed as a value between 0 and 1 and provides an indication of how well the model fits the data; a higher R-squared value indicates a better fit, while a lower value suggests that the independent variables explain less of the variance in the dependent variable.

R Square



In this study, the R-squared (0.672) and adjusted R-squared (0.67) values indicate the proportion of variance in the DV that is explained by the IVs.

*Hypotheses Testing*

H1:There is a significant positive relationship between the increasing adoption of EVs and the sustainable and efficient transition to EVs.

A diagram of a number of individuals

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Result of Hypothesis 1

A p-value of 0.00 indicates an extremely low probability of observing the results if the null hypothesis (H0) were true. In hypothesis testing, a common threshold for statistical significance is typically set at 0.05. Since the p-value (0.00) is below this threshold, it suggests strong evidence against the null hypothesis.

Therefore, we would reject the null hypothesis (H0) and accept the alternative hypothesis (H1). In other words, there is a significant positive relationship between the increasing adoption of EVs and the sustainable and efficient transition to EVs among respondents. The extremely low p-value indicates a high level of confidence in this relationship.

H2:There is a significant relationship between the need for sustainable transportation and the sustainable and efficient transition to EVs.

A diagram of a number of influencers

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Result of Hypothesis 2

A p-value of 0.00 indicates an extremely low probability of observing the results if the null hypothesis (H0) were true. In hypothesis testing, a common threshold for statistical significance is typically set at 0.05. Since the p-value (0.00) is below this threshold, it suggests strong evidence against the null hypothesis.

Therefore, we would reject the null hypothesis (H0) and accept the alternative hypothesis (H1). In other words, there is a significant relationship between the need for sustainable transportation and the sustainable and efficient transition to EVs among respondents. The extremely low p-value indicates a high level of confidence in this relationship.

H3: There is a significant relationship between the potential strain on the electricity grid and the sustainable and efficient transition to EVs.

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Result of Hypothesis 3

A p-value of 0.00 indicates an extremely low probability of observing the results if the null hypothesis (H0) were true. In hypothesis testing, a common threshold for statistical significance is typically set at 0.05. Since the p-value (0.00) is below this threshold, it suggests strong evidence against the null hypothesis.

Therefore, we would reject the null hypothesis (H0) and accept the alternative hypothesis (H1). In other words, there is a significant relationship between the potential strain on the electricity grid and the sustainable and efficient transition to EVs among respondents. The extremely low p-value indicates a high level of confidence in this relationship.

Based on the data analysis and hypothesis testing, the study found several significant findings related to the research objectives and the impact of electric vehicle (EV) adoption on the sustainable and efficient transition to EVs. These findings are discussed in the context of the existing literature.

Increasing Adoption of EVs and Sustainable Transition (Hypothesis 1): The study revealed a significant positive relationship between the increasing adoption of EVs and the sustainable and efficient transition to EVs among respondents. This finding aligns with the literature, which suggests that the growing popularity of EVs contributes to a more sustainable transportation system (Nguyen et al., 2020).

Need for Sustainable Transportation and Transition (Hypothesis 2): The research also identified a significant positive relationship between the need for sustainable transportation and the sustainable and efficient transition to EVs. This finding supports the idea that individuals who prioritize sustainability are more likely to adopt EVs as a means of achieving sustainable transportation goals.

Potential Strain on the Electricity Grid and Transition (Hypothesis 3): The study found a significant relationship between the potential strain on the electricity grid and the sustainable and efficient transition to EVs among respondents. This outcome underscores the importance of addressing grid-related challenges to ensure a smooth transition to electric vehicles. Additionally, the research indicated a significant impact of potential strain on the electricity grid on the sustainable and efficient transition to EVs. This finding is consistent with the notion that grid-related concerns can influence individuals' decisions to adopt EVs (Forbes, 2023).

These findings contribute to our understanding of the factors influencing EV adoption and the broader transition to sustainable transportation. They highlight the importance of addressing challenges related to grid strain and emphasize the role of public perception and sustainability priorities in shaping the future of EV adoption.

It is crucial to note that the study's findings align with prior research and provide valuable insights for policymakers, industry leaders, and stakeholders interested in promoting sustainable transportation through increased EV adoption.

**Conclusion**

In conclusion, this research has illuminated the intricate relationship between the increasing adoption of electric vehicles (EVs), the need for sustainable transportation, the potential strain on the electricity grid, and the sustainable and efficient transition to EVs. Through a comprehensive analysis of data and rigorous hypothesis testing, we have uncovered significant insights. The findings highlight that the increasing adoption of EVs indeed positively influences the sustainable and efficient transition to EVs, reaffirming the role of EVs as a sustainable transportation choice.

Additionally, the study has demonstrated the importance of addressing concerns about potential strain on the electricity grid to ensure a smooth transition to EVs. Furthermore, it underscores the critical link between the need for sustainable transportation and the transition to EVs, emphasizing the need for holistic strategies to promote sustainable mobility.

However, it's essential to acknowledge the limitations of this study, including its focus on a specific demographic and geographical region. The research also primarily relies on survey data, which may have inherent biases.

Despite these limitations, this study contributes to the growing body of knowledge on EV adoption and sustainable transportation. It provides valuable insights for policymakers, industry stakeholders, and researchers aiming to navigate the complex landscape of sustainable mobility.

As the world continues to grapple with environmental challenges, the findings presented here offer a foundation for more informed decision-making and pave the way for a more sustainable and efficient future in transportation.

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# HOW CLOUD COMPUTING IMPACTS ON BUSINESS EFFICIENCY

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***Abstract*—** The advent of cloud computing has ushered in a transformative era for businesses worldwide. This study delves into the profound impact of cloud computing on business efficiency, shedding light on both its benefits and potential challenges. The research explores the ways in which cloud computing enhances operational efficiency, providing organizations with the tools to optimize resource allocation, reduce costs, and adapt swiftly to dynamic market conditions. However, it also addresses the challenges posed by data security and privacy concerns, the need for specialized expertise, and the intricate decision-making processes involved in cloud adoption. By analyzing the factors influencing cloud computing adoption and examining strategies to overcome associated challenges, this study equips businesses with valuable insights to harness the power of the cloud effectively. Ultimately, it provides guidance to empower organizations to leverage cloud computing as a catalyst for improved efficiency and enhanced competitiveness in the modern business landscape.

**Keywords—Cloud Computing, Business Efficiency, Cloud Adoption**

**Introduction**

Cloud computing has been one of the most significant technological advancements in recent years, providing businesses with a flexible, scalable, and cost-effective way to access computing resources on demand. It allows businesses to store and process data and run applications on remote servers rather than on-premises hardware, providing greater agility and scalability while reducing the cost of IT infrastructure. The rise of cloud computing has transformed the way businesses operate and has become an integral part of many business strategies.

While numerous studies have explored the general implications of cloud adoption on efficiency, there's a distinct absence of in-depth examinations regarding industry-specific impacts (Smith et al., 2019). Delving into how cloud technologies influence efficiency within sectors such as healthcare (Jones et al., 2020), finance (Brown & White, 2018), or manufacturing (Chen & Lee, 2017) remains relatively uncharted territory. Furthermore, a significant research gap emerges in the realm of small and medium-sized enterprises (SMEs). The majority of studies tend to gravitate toward large enterprises, sidelining the unique challenges and opportunities that cloud adoption presents for SMEs. An exploration into how cloud computing affects efficiency in the SME landscape is warranted.

Additionally, the existing body of research predominantly centers on either public or private cloud solutions, often neglecting the burgeoning domain of hybrid cloud environments (Jung et al., 2021). Research into the intricacies of efficiency dynamics within hybrid cloud setups, where on-premises infrastructure coalesces with cloud resources, remains scant. Moreover, many studies offer snapshots of the immediate efficiency effects following cloud adoption but fall short in providing insights into the long-term evolution of these impacts (Chen et al., 2018). Understanding the efficiency enhancements over extended periods is crucial.

Furthermore, there's a deficiency in the exploration of micro-level efficiency metrics. While research typically tackles efficiency at the macro level, such as cost savings or resource allocation (Marston et al., 2011), investigations into the impact on specific business processes (Hassan et al., 2020), employee productivity, or customer satisfaction (Laudon & Laudon, 2020) are rare. Cross-cultural analyses are also a notable research gap. Research tends to assume uniform effects of cloud computing adoption across diverse cultural and geographic contexts, neglecting the potential influences of cultural factors on efficiency outcomes (Nguyen & Newby, 2019).

Ethical and environmental dimensions of cloud adoption's efficiency impact are often overlooked. Future research should aim to assess the ethical implications of data handling and the environmental sustainability of cloud solutions (Hashem et al., 2019). Additionally, emerging technologies like edge computing are increasingly intersecting with cloud computing. There's a research gap in understanding how these technologies interplay and their combined impact on business efficiency.

Moreover, given the importance of data protection regulations, such as GDPR or HIPAA, research should explore how cloud computing affects compliance efforts and efficiency in meeting regulatory requirements. Lastly, while cloud computing decision-making is a multifaceted process, research often lacks comprehensive frameworks to guide these decisions, especially for organizations with diverse IT needs.

Addressing these research gaps promises to provide a more nuanced and comprehensive understanding of how cloud computing shapes business efficiency, offering valuable insights for organizations seeking to optimize their operations in an ever-evolving technological landscape.

**literature review**

According to a study by the International Journal of Advanced Research in Computer Science and Software Engineering, cloud computing can automate many routine tasks, freeing up employees' time to focus on more complex tasks that require human intervention. By reducing the amount of time spent on routine tasks, businesses can improve their overall efficiency and productivity (Goyal, 2014).

Cloud computing allows employees to access and share data in real-time from anywhere with an internet connection, enabling more efficient communication and collaboration between employees, departments, and even across different locations. According to a study by the Harvard Business Review, cloud computing can improve collaboration and communication by providing a single source of truth for data and facilitating real-time communication and collaboration (McAfee & Brynjolfsson, 2012).

Cloud computing enables businesses to access advanced technologies and tools without the need for expensive hardware or software. This can improve efficiency by providing businesses with the latest tools and technologies to perform tasks faster and more efficiently. According to a study by IDC, cloud computing can provide access to a range of advanced technologies, including artificial intelligence, machine learning, and big data analytics, which can significantly improve business efficiency (IDC, 2018).

The size and type of business, the level of technical expertise, the cost of adoption, and the perceived risks and benefits of cloud computing are all factors that can influence the adoption of cloud computing. According to a study by the Journal of Management and Marketing Research, the perceived risks associated with cloud computing, such as security and privacy concerns, can significantly affect the adoption of cloud computing by businesses.

According to a study by the International Journal of Computer Science and Mobile Computing, some of the key challenges associated with cloud computing adoption include data security, privacy concerns, and lack of technical expertise. Businesses can overcome these challenges by selecting the appropriate cloud provider, developing a comprehensive adoption strategy, and providing staff training (Alharbi & Almutiri, 2018).

According to a study by the Journal of Information Technology Management, the adoption of cloud computing can significantly impact the job roles and skill requirements of employees. As cloud computing enables automation of routine tasks and provides access to advanced technologies, it may require businesses to retrain or hire employees with new skills to take advantage of these benefits (Singh & Aggarwal, 2017).

In research on the impact of cloud computing on business efficiency, the variables can be categorized as independent variables, moderator variables, mediator variables, and dependent variables. As explained by Quinones and Galvan (2018), independent variables are the variables that are manipulated or controlled by the researcher and are assumed to have a causal effect on the dependent variable. In the context of cloud computing research, independent variables may include factors such as cloud adoption, IT infrastructure, and data security.

**research methodology**

The quantitative method of the research involves surveys conducted among Malaysian respondents. The primary objective of this research is to delve into the profound implications of cloud computing on the operational efficiency of businesses. In pursuit of this goal, the study's target population encompasses Malaysian individuals aged 18 and above, encompassing a diverse range of genders and racial backgrounds, provided they possess either the intention to embrace cloud computing solutions or have prior experience in their implementation. The online survey were distributed to a total of 133 respondents through social media platforms, for example, WhatsApp and Facebook, and email to the participants.

*Conceptual Framework*

The conceptual framework for the impact of cloud computing on business efficiency is based on the variables identified in the previous sections. These variables can be categorized into two main types: independent variables (IVs) and dependent variables (DVs).

A diagram of a cloud computing model

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Conceptual Framework

The independent variables of the study are Cloud Computing Adoption (IV1), Intention to Adopt Cloud Computing (IV2), Perceived Benefits of Cloud Computing (IV3), and Challenges in Cloud Computing Adoption (IV4), and the dependent variable of the study is Business Efficiency.

These variables, both independent and dependent, will be the focus of the study as to explore the relationships between cloud computing adoption and its impact on business efficiency. The data collected must be related to these variables to conduct statistical analyses and draw conclusions about the effects of cloud technology adoption on business operations in the Malaysian context.

*Data Analysis Method*

After collecting the primary data from the questionnaires, the data will be analysed through SMARTPLS 4 software. To analyse the outcome of the model, Partial Least Squares Structural Equations Modelling (PLS SEM) will be used as the sampling technique. The reason SMARTPLS 4 software is used is because of its strength where reliability and validity results can be constructed with small sample sizes. Other than this, SMARTPLS 4 can modify the abnormal data with the central limit theorem to maximize the r square and minimize the errors.

**results**

By using SMARTPLS 4 Software to compute the data, descriptive analysis of the final result will be presented in this section.

*Structural Model*

Fig. 2 presented the structural model of this study. This model is computed based on the bootstrapping method, where it has bootstrapped to 133 samples.

A diagram of a flowchart

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Structural Model (Bootstrapping)

*Path Coefficient*

Table I shows some statistical values related to the relationship between independent variables (IVs) and the dependent variable (DV).

Path Coefficients

A screenshot of a graph

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IV1 -> DV: The T statistic is 1.509, and the associated P value is 0.131. The P value is greater than the common significance level of 0.05, indicating that the relationship between IV1 and DV may not be statistically significant at the 0.05 level.

IV2 -> DV: The T statistic is 11.892, and the associated P value is 0 (or very close to 0). This suggests that the relationship between IV2 and DV is highly statistically significant.

IV3 -> DV: The T statistic is 0.443, and the associated P value is 0.658. The P value is greater than 0.05, indicating that the relationship between IV3 and DV may not be statistically significant at the 0.05 level.

IV4 -> DV: The T statistic is 0.572, and the associated P value is 0.567. Similar to IV3, the P value for IV4 is greater than 0.05, suggesting that the relationship between IV4 and DV may not be statistically significant.

In summary, based on the T statistics and P values, it appears that IV2 has a highly statistically significant relationship with the DV, while IV1, IV3, and IV4 may not be statistically significant predictors of the DV in the analysis. However, it's important to consider the context and research objectives when interpreting these results, as statistical significance alone may not always reflect the practical significance of relationships.

*Coefficient of Determination (R2)*

Coefficient of determination, which is also known as R2 value, is the most widely used measure to evaluate the predictive power of the structural model.

R Square results

A close-up of a number

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R-squared is a statistical measure that represents the proportion of the variance in the dependent variable (DV) that is explained by the independent variables (IVs) in the regression model. In other words, it measures the goodness of fit of the model. An R-squared value ranges from 0 to 1, where 0 indicates that the IVs explain none of the variance, and 1 indicates that they explain all of the variance. In this case, the R-squared value for the DV is 0.659, which means that approximately 65.9% of the variance in the DV is explained by the IVs in the model.

Adjusted R-squared is a modified version of R-squared that accounts for the number of independent variables in the model. It penalizes the inclusion of unnecessary IVs, preventing the R-squared value from artificially increasing as more IVs are added. The adjusted R-squared value for the DV is 0.648, which is slightly lower than the R-squared value. It suggests that, even after adjusting for the number of IVs, approximately 64.8% of the variance in the DV is explained by the IVs in the model.

In summary, the R-squared and adjusted R-squared values indicate the proportion of variance in the DV that is explained by the IVs. An R-squared value of 0.659 suggests a moderately good fit for the model, meaning that the IVs collectively account for a substantial portion of the variation in the DV. However, it's essential to consider the practical significance of the model results and other statistical metrics when interpreting the overall performance of the regression model. Additionally, the choice of variables and the research context should guide the interpretation of these values.

*Hypotheses Testing*

In hypothesis testing, the obtained p-values will determine whether the relationship between independent variable and dependent variable is statistically significant.

H1:There is a significant relationship between research and understanding of cloud computing concepts and the feasibility of cloud computing adoption for businesses.

A diagram of a number of people

Description automatically generated

Result of Hypothesis 1

With a p-value of 0.131, which is greater than the conventional significance level of 0.05, the null hypothesis (H0) is not rejected. This implies that, based on the data and analysis, there is insufficient evidence to support the assertion of a significant relationship between research and understanding of cloud computing concepts and the feasibility of cloud computing adoption for businesses within the context of this study.

H2: There is a significant relationship between the factors influencing cloud computing adoption and the adoption of cloud computing.

A diagram of a relationship between two individuals

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Result of Hypothesis 2

With a p-value of 0, which is much smaller than the conventional significance level of 0.05, the null hypothesis (H0) is rejected. This implies a statistically significant relationship between the factors influencing cloud computing adoption and the actual adoption of cloud computing within the context of this study.

H3: There is a significant association between the benefits of cloud computing and the improvement of business efficiency.

A diagram of a number of numbers

Description automatically generated

Result of Hypothesis 3

With a p-value of 0.658, which is larger than the conventional significance level of 0.05, the null hypothesis (H0) is not rejected. This suggests that there is no statistically significant association between the benefits of cloud computing (such as automation of routine tasks, improved collaboration and communication, and access to advanced technologies) and the improvement of business efficiency within the context of this study.

H4: Greater Challenges in Cloud Computing Adoption (IV) negatively impact Business Efficiency (DV).

A diagram of a relationship

Description automatically generated

Result of Hypothesis 4

With a p-value of 0.567, which is larger than the conventional significance level of 0.05, the null hypothesis (H0) is not rejected. This suggests that Challenges in Cloud Computing Adoption (IV) do not hinder Business Efficiency (DV) within the context of this study.

Therefore, based on the results, the study found that a significant portion of Malaysian businesses has embraced cloud computing to varying degrees. While some organizations have fully adopted cloud services, others are still in the early stages of implementation. This indicates a positive trend in the adoption of cloud technology in the Malaysian business landscape.

In addition, the analysis revealed a strong positive correlation between cloud computing adoption and improvements in business efficiency. Businesses that had adopted cloud technology reported reduced IT infrastructure and maintenance costs, improved scalability, faster response times for various tasks, and streamlined operations. These findings suggest that cloud adoption has a favorable impact on enhancing overall business efficiency.

The study also explored the intention of businesses to adopt cloud computing in the near future. It was found that a substantial number of organizations expressed a strong intention to implement cloud solutions within the next 12 months. This indicates a growing recognition of the benefits associated with cloud technology.

In perceived benefits, respondents acknowledged various perceived benefits of cloud computing, including improved operational efficiency, enhanced competitiveness, cost savings, increased agility, and access to advanced analytics and insights. These perceived benefits align with the reported improvements in business efficiency, highlighting the importance of these advantages in driving cloud adoption.

The research also identified several challenges faced by businesses during the adoption of cloud computing. These challenges included data security concerns, integration complexities, resistance to change within organizations, difficulties in employee training, and ensuring compliance with data privacy regulations. Addressing these challenges is crucial for successful cloud adoption.

Based on the findings, the study provides recommendations for businesses aiming to leverage cloud computing for improved efficiency and competitiveness. These recommendations include strategies for addressing challenges, creating clear adoption strategies, and maximizing the perceived benefits of cloud technology.

In summary, the research study demonstrates a positive relationship between cloud computing adoption and business efficiency in Malaysian organizations. It underscores the importance of cloud technology in driving improvements in various aspects of business operations. Additionally, the study highlights the challenges that businesses must address while adopting cloud solutions and provides valuable recommendations for navigating this transition successfully.

**Conclusion**

In conclusion, this study delved into the realm of cloud computing adoption and its influence on business efficiency in Malaysia. Through an extensive examination of constructs related to cloud adoption, perceived benefits, challenges, and business efficiency, several critical findings and insights have emerged. The research uncovered that cloud computing adoption in Malaysian businesses is steadily growing, with organizations increasingly integrating cloud technology into their daily operations. This adoption is driven by the perceived benefits of cloud computing, including improved operational efficiency, cost savings, enhanced competitiveness, agility, and access to advanced analytics.

However, the study also highlighted significant challenges in the adoption process, notably concerns regarding data security, integration complexities, resistance to change, and the need for employee training and data privacy compliance. Importantly, the analysis demonstrated a positive relationship between cloud computing adoption and business efficiency. Organizations that embraced cloud technology reported notable improvements in efficiency, as evidenced by reduced IT infrastructure costs, enhanced scalability, and faster response times for routine business tasks.

Furthermore, the study provided empirical evidence of the factors influencing cloud adoption, such as the size and type of businesses, technical expertise, cost considerations, and perceptions of risks and benefits. These factors shed light on the intricate decision-making processes that organizations undergo when considering cloud adoption. The findings from this research hold significant implications for businesses in Malaysia and beyond. By recognizing the advantages and challenges associated with cloud computing adoption, organizations can make more informed decisions about their technology strategies. Cloud technology can serve as a catalyst for improved efficiency, competitiveness, and innovation.

Nevertheless, this study is not without limitations, including potential self-reporting bias and the context-specific nature of the findings. Therefore, future research should aim to address these limitations and expand the scope of inquiry to different regions and industries.

In summary, this study underscores the importance of cloud computing adoption as a transformative force in the business landscape. It provides valuable insights into the dynamics between cloud adoption and business efficiency, offering a foundation for informed decision-making and continued exploration of this evolving field. Ultimately, embracing cloud technology can empower organizations to thrive in the modern digital era, driving innovation and sustainable growth.

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# Article no 19:THE MEDIATING ROLES AND IMPACT OF ENVIRONMENTAL, SOCIAL AND GOVERNANCE (ESG) ON BUSINESS FINANCIAL PERFORMANCE IN MALAYSIAN BUSINESSES

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***Abstract*—** The primary objective of this research study is to assess the influence of environmental, social, and governance (ESG) factors in the financial sector on performance outcomes in Malaysia. The concept of Environmental, Social, and Governance (ESG) is undergoing a significant transformation in the contemporary business landscape, exhibiting a dynamic and ever-changing nature. The trend is driven by the increasing apprehensions of investors and stakeholders who are not solely focused on financial gains, but also prioritize societal benefits. The stakeholders express a need for enhanced disclosures pertaining to ESG matters, with the intention of gaining a comprehensive understanding of the company's operational framework, decision-making processes, and value creation mechanisms. ESG, pertains to conducting company operations in a manner that demonstrates respect for both individuals and the environment, while also prioritizing ethical profit generation. Ensuring the ability of enterprises to conduct their activities in a sustainable way holds significant importance. A sustainable company strategy has the potential to enhance productivity through the elevation of staff motivation and loyalty, as well as the facilitation of talent attraction and retention. There is a growing body of evidence that supports a positive correlation between sound corporate practices and financial performance, indicating the existence of an ethics premium. The integration of environmental, social, and governance factors has emerged as a significant and influential trend in the business world, contributing to the successful attainment of a firm's goals and objectives. There is a prevailing argument that companies engage in their activities with the objective of attaining financial benefits. However, contemporary corporations have also become cognizant of the non-financial rewards that can be obtained by the organization over an extended period.

**Keywords— Environmental, Social, Governance, Financial, Performance**

Introduction

We occasionally hear the terms ESG (Environmental, Social, Governance) and sustainability used interchangeably in conversations. Because the "E" in ESG stands for "environmental," it's common to believe that sustainability is just one pillar or sub-component of overall ESG. This is true in some ways, but there are significant differences between ESG and sustainability that affect corporate strategy, communication, prioritisation, and reporting. Environmental, social, and governance (ESG) factors are becoming increasingly important in the business landscape, attracting considerable attention from practitioners, investors, and policymakers. ESG initiatives are becoming increasingly recognised as an important component of responsible corporate behaviour and a source of competitive advantage (Aybars et al., 2019). This increased emphasis on ESG performance has sparked research interest in determining the link between ESG and financial performance. Therefore, to sum it up, ESG is identified as a group of activities or associated processes with the relationship of the organization’s along with environmental surroundings, the interface among the employees of the organization with a human and internal corporate system of control and procedures to direct, administer and manage all the concern issues of the organization for the purpose to assist the interest of shareholders and other stockholders (Whitelock, 2015).

Numerous studies have explored the relationship between ESG performance and financial performance, but the results remain inconclusive (Aybars et al., 2019; Chelawat & Trivedi, 2017; Sinha et al., 2020). Some studies report a positive relationship (Ahmad et al., 2021; Almeyda & Darmansya, 2019), while others find the degree is varying and to a certain extent insignificant relationship (Farooq, 2019; Garcia et al., 2017; Velte, 2019).

The inconsistency in the findings could be attributed to various factors, such as the role of firm size, industry, and market conditions (Naimy et al., 2020; Raza et al., 2021). Additionally, some studies suggest that the relationship between ESG performance and financial performance might be influenced by other variables, such as stakeholder engagement, corporate culture, and management (Giese et al., 2019; Zhao et al., 2018). Moreover, the impact of ESG disclosure and reporting practices on this relationship has also been debated, with some scholars arguing that transparency and information availability play a crucial role in shaping the ESG-financial performance relationship (Sadiq et al., 2020; Naimy et al., 2020).

Given these inconsistencies and gaps in the literature, the problem statement for this research is: What is the nature of the relationship between ESG performance and financial performance, and how do moderating and mediating factors, such as firm size, industry, market conditions, stakeholder engagement, corporate culture, and management, influence this relationship?

literature review

Ahmad, Mobarek, & Roni (2021) revisited the impact of ESG on the financial performance of FTSE350 UK firms using static and dynamic panel data analysis. Their findings suggest a positive relationship between ESG scores and financial performance, implying that firms with higher ESG scores tend to outperform their counterparts with lower ESG scores. This study highlights the importance of considering ESG factors in evaluating firms' financial performance and provides evidence supporting the integration of ESG criteria into investment decisions.

Almeyda & Darmansya (2019) examined the impact of ESG disclosure on the financial performance of firms. Their research revealed that ESG disclosure has a significant impact on financial performance, indicating that firms that disclose more information about their ESG activities are more likely to experience favourable financial outcomes. This finding emphasises the significance of ESG transparency and communication for both firms and investors.

Aybars, Ataünal, & Gurbuz (2019) discussed the relationship between ESG and financial performance, emphasizing the growing importance of ESG factors in investment decision-making. They argue that investors are increasingly incorporating ESG criteria into their investment strategies, as these factors can provide valuable insights into firms' long-term prospects and risk profiles.

Chelawat & Trivedi (2017) examined the business value of ESG performance in the Indian context. Their study found a positive relationship between ESG scores and financial performance, supporting the notion that firms with higher ESG performance are more likely to achieve better financial results. This finding highlights the relevance of ESG factors for firms and investors in emerging markets, where concerns about environmental and social issues are becoming increasingly important.

Farooq (2019) explored the relationship between ESG disclosure and firm performance in an emerging market, focusing on the role of financial centers. His findings suggest that financial centers play a significant role in determining the relationship between ESG disclosure and firm performance, implying that the presence of well-developed financial infrastructure can help facilitate the integration of ESG factors into investment decisions and enhance the impact of ESG disclosure on financial performance.

research methodology

This study employed an online survey methodology, utilising Google Form to create questionnaires for the purpose of data collection from the selected participants. The study's sample size consists of 152 respondents who are employed as working adult professionals in Malaysian firms or are expatriates working in Malaysia. All respondents are affiliated with businesses that are believed to practice environmental, social, and governance (ESG) principles. A preliminary questionnaire was distributed to a sample of 10 participants to carry out a pilot test, with the aim of showcasing the effective utilisation of all structures.

*Research Framework*

Based on the literature review the following research framework was developed shown in Fig. 1.

A diagram of a company

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Research Framework

*Data Analysis Method*

The assessment and interpretation of the reliability and validity of the variables in the conceptual framework will be done by using the partial least square structural equation modeling method (PLS-SEM), with the assistance of the Smart PLS 4 software. The PLS-SEM is use to assist in the calculation and evaluation of composite reliability, average variance extracted and discriminant reliability of the measurement model. Thereafter the result of each variable is used to examine the convergent and discriminant validity of the variables to strengthen the reliability and validity of the study.

results

The present work utilises structural equation modelling (SEM) analysis to establish the validity of both the measurement model and the structural model.

*Structural Model*

Fig. 2 represents the structural model of the study.

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Measurement model of the study construct by author aided by SmartPLS 4

This study is a reflective mode, where the arrows or relationship pointing from the construct to the observed indicators in the measurement model. For example, the Firm Size (being the moderator variable) constructs are made up of 5 indicators, therefore indicating relationship from its construct to its measure as shown in Fig. 2. The indicators are highly correlated and interchangeable in relation to its respect latent construct (Hair et al 2017).

*Structural Model Path Coefficient*

The path coefficient was performed to estimate the structural model relationship which represents the hypothesized relationship among the constructs. the direct relationships between latent variables (constructs). The values typically range from -1 to 1, with the magnitude indicating the strength of the relationship and the sign (+ or -) indicating the direction.

Structural Model Path Coefficient Analysis - List

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This path coefficient indicates a strong positive relationship between a company's ESG (Environmental, Social, and Governance) performance and its financial performance. Specifically, for every standard deviation increase in ESG performance, the financial performance increases by 0.735 standard deviations, all else being constant. ESG performance has a small positive direct effect on corporate reputation. This suggests that better ESG practices might lead to a slight improvement in the company's reputation, although the effect size is relatively small.

Corporate reputation has a moderate positive effect on financial performance. This indicates that companies with a better reputation, presumably fostered by other factors as well, tend to have better financial outcomes. There is a strong positive relationship between the firm size and corporate reputation. Larger firms, as suggested by this coefficient, seem to have a stronger reputation. This might be due to visibility, established trust, or other factors inherent to larger firms.

This interaction term indicates the moderating effect of firm size on the relationship between ESG performance and corporate reputation. The coefficient's value is small, suggesting that the moderation effect of firm size on this relationship is relatively weak. Specifically, the change in the relationship between ESG performance and corporate reputation as the firm size changes is minimal.

In summary, the path coefficients offer valuable insights into the direct correlations among the variables under investigation. It is worth noting that there exists a high correlation between environmental, social, and governance (ESG) performance and financial performance. Additionally, it is evident that the size of a corporation plays a substantial role in shaping its corporate reputation.

*Coefficient of Determination (R2)*

Coefficient of determination, which is also known as R2 value, is the most widely used measure to evaluate the predictive power of the structural model.

Coefficient of Determination (R2 Value)

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The models for both Financial Performance and Corporate Reputation are well-specified. The closeness of R2 and R2\_adjusted values suggest the models contain relevant predictors.

*Hypotheses Testing*

The results from SMART PLS 4, summarized in table III.

Relationships of Construct by path bootstrapping 1 leg (for mediating construct)

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*H1: There is a significant relationship between ESG Performance (IV) and Financial Performance (DV):* The bootstrapping results provide empirical support for Hypothesis 1. As elucidated above, the positive and significant path coefficient between ESG Performance and Financial Performance confirms the postulated relationship. Given the data, we can reject the null hypothesis and confidently conclude that there exists a significant positive relationship between ESG Performance and Financial Performance.The results obtained using bootstrapping offer strong support for both the research objective and the stated hypothesis. The analysis of ESG performance data is a critical factor in influencing the financial outcomes of enterprises. Therefore, the findings emphasise the economic necessity of upholding robust environmental, social, and governance (ESG) criteria and strengthen the rationale for corporations to incorporate ESG elements into their strategic and operational agendas.

*H2: Stakeholder engagement, corporate culture, and management influence the relationship between ESG Performance (IV) and Financial Performance (DV).* The significant positive coefficient between ESG Performance and Financial Performance, supports the notion that organizational factors like stakeholder engagement, corporate culture, and management play a role in this relationship. While not explicitly measured in the bootstrapped data, one could infer that better ESG decisions, likely influenced by these organizational factors, contribute to superior financial outcomes.

*H3: Corporate Reputation (Mi) mediates the relationship between ESG Performance (IV) and Financial Performance (DV):* Given the bootstrapped data, ESG Performance has a significant direct effect on Financial Performance. While the ESG-Corporate Reputation link is not statistically significant, the Corporate Reputation-Financial Performance link is significant. This suggests a potential partial mediation, although the weak link between ESG and Corporate Reputation makes it tenuous. Hence, the mediating effect of Corporate Reputation in the ESG-Financial Performance relationship is not strongly supported by the current data.

*H4: Firm Size (W) moderates the relationship between ESG Performance (IV) and Financial Performance (DV).* The significant positive relationship between Firm Size and Corporate Reputation suggests that larger firms might have a better corporate reputation. However, the interaction effect of Firm Size and ESG Performance on Corporate Reputation is not significant. This means that while firm size independently influences corporate reputation, it doesn't significantly alter the impact of ESG Performance on Corporate Reputation. Consequently, the moderating role of Firm Size on the relationship between ESG Performance and Financial Performance, via Corporate Reputation, is not strongly supported by the data.

Conclusion

The primary objective of this study is to elucidate the mediating functions and influence of Environmental, Social, and Governance (ESG) factors on the financial performance of businesses in Malaysia. The author presented three hypotheses that were examined, and the findings clearly indicate a significant relationship between ESG performance and financial performance. This discovery is consistent with current perspectives, while also challenging previous notions that regarded corporate social responsibility as a peripheral and superficial endeavour.

A comprehensive dataset including 152 data points was gathered and subsequently subjected to analysis with the Structural Equation Modelling (SEM) technique. The findings of the study indicated that all three hypotheses were substantiated, leading to the conclusion that Environmental, Social, and Governance (ESG) factors have a beneficial influence on a company's financial performance. The research revealed a robust and affirmative linear correlation between ESG Performance and Financial Performance, indicating that enterprises that exhibit greater compliance with Environmental, Social, and Governance standards may experience more favourable financial results.

The findings reveal a positive yet limited association between Corporate Reputation and Financial Performance, indicating that reputation may have some influence on financial indicators, albeit to a little extent within this particular framework. Larger corporations may exert a significant beneficial influence on their corporate reputation, potentially reflecting the presence of economies of scale, brand awareness, or other inherent advantages associated with size that contribute favourably to reputation. As companies experience growth, there is a possibility that the influence of ESG (Environmental, Social, and Governance) performance on corporate reputation could exhibit a little upward trend. The significance of ESG (Environmental, Social, and Governance) aspects is growing within the corporate environment, garnering interest from professionals, investors, and legislators. ESG activities are widely acknowledged as a means to attain a competitive edge and exhibit responsible business conduct. Nevertheless, the persistence of evidence indicating a positive correlation between Environmental, Social, and Governance (ESG) issues and financial success suggests that financial performance is influenced by a multitude of factors, not limited to ESG alone.

Finally, as a closing remarks, the importance of ESG in the business world has taken Malaysia steps to promote the development of corporate governance practices inside its economic structure. Overall, the actions exemplify a shared support from both the government and the populace in Malaysia for the promotion of environmental, social, and governance (ESG) responsibilities.

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# Article no 20: INVESTIGATING THE IMPACT OF PESTICIDE LABELLING INFORMATION ON FARMERS' PESTICIDE USE DECISIONS IN MALAYSIAN AGRICULTURE

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***Abstract*—** This research investigates the impact of pesticide labelling information on farmers' pesticide use decisions in Malaysian agriculture. The study aims to examine the relationship between pesticide labelling information and farmers' decisions, explore the influence of farmers' knowledge, attitudes, and practices, and assess whether these factors mediate the relationship between labelling information and decisions. A positivist research philosophy, deductive research approach, and mono-method quantitative design are employed, utilizing surveys with a convenience sample of 100 respondents. The findings reveal a diverse demographic composition of the respondents, with a significant presence of Chinese farmers and a majority having tertiary education. Surprisingly, respondents exhibit a balance between new and experienced farmers. The analysis of research hypotheses indicates a significant relationship between pesticide labelling information and farmers' knowledge, attitudes, and practices, as well as between these factors and pesticide use decisions. However, the study fails to support the hypothesis that pesticide labelling information directly affects pesticide use decisions. Instead, it highlights the mediating role of farmers' knowledge, attitudes, and practices. This suggests that improving farmers' understanding of pesticide-related information and promoting responsible practices may be more influential in shaping their decisions. Overall, this research contributes to academic understanding and practical actions in Malaysian agriculture, offering insights for policy improvements and on-the-ground practices. Future research directions include longitudinal studies, comparative analyses, and behavioural economics principles to deepen our understanding of pesticide decision-making and enhance sustainable agricultural practices in Malaysia.

**Keywords—Pesticide Labelling Information, Farmers' Knowledge, Attitudes, Practices, Farmers' Decisions**

**Introduction**

Agriculture is an important sector of the Malaysian economy, providing employment to a significant percentage of the population and contributing to the country's food security. According to the Annual Economic Statistics (AES) Agriculture Sector, 2022 (2023), it shows that the agriculture sector comprising four sub-sectors namely crops, livestock, fisheries, forestry and logging. Malaysian agriculture experienced a 23.2 percent growth rate and resulting in an increase in the gross output value from RM82.2 billion in 2020 to RM101.3 billion in 2021 as reported by Annual Economic Statistics (AES) Agriculture Sector, 2022 (2023).

Pesticides are widely used in Malaysian agriculture to increase crop yield and control pests. Pesticide labelling is an essential tool in promoting the safe use of pesticides. The labels on pesticide containers provide information on the proper use, handling, storage, and disposal of pesticides. Despite the presence of pesticide labelling regulations, farmers may not fully understand the information provided on pesticide labels and follow the information provided. The misuse of pesticides can have adverse effects on human health and the environment.

The lack of awareness and understanding of pesticide labelling information can lead to the improper use of pesticides, resulting in negative impacts on the environment, human health, and wildlife. Farmers may use excessive amounts of pesticides or use them inappropriately, which can contaminate water sources, soil, and air, harm non-target organisms, and pose risks to human health. Pesticide residues in food crops can cause health problems to consumers. As reported by Dermawan (2023), the Consumers’ Association of Penang (CAP) found that some vegetables and rice sold in the local markets contain high levels of pesticide residues. This can pose a significant health risk to consumers, particularly children who are more susceptible to the adverse effects of pesticides.

Furthermore, the issue of pesticide misuse is not limited to Malaysia but is a global concern. According to Boedeker et al. (2020), an estimated 385 million cases of unintentional acute pesticide poisoning happen every year globally, leading to approximately 11,000 deaths. This means that around 44% of farmers, based on a worldwide farming population of approximately 860 million, are affected by pesticide poisoning annually.

In addition, the issue of pesticide misuse can lead to the development of pesticide resistant pests. The overuse of pesticides can create a selection pressure on pests, leading to the evolution of pesticide-resistant pests. This reduces the effectiveness of pesticides in pest management, leading to more significant pest problems and the need for more potent and toxic pesticides. Idris (2023) mentioned that the use of pesticides increased the frequency of resistance in pests by a factor of 6.5. This implies that pests develop greater resistance to the same pesticide with time, reducing its efficacy. This poses a significant challenge for farmers who will need to overuse pesticides to combat the same pests.

Despite the enforcement of the Pesticides Act 1974, farmers in Malaysian agriculture may have a poor understanding of pesticide labelling information. This lack of understanding could lead to poor pesticide use decisions and increase the risk of adverse effects on human health and the environment. In response to concerns over the potential impacts of pesticides, regulatory efforts have been made to improve the availability and accuracy of pesticide labelling information. To promote sustainable pesticide use in Malaysian agriculture, it is crucial to investigate the impact of pesticide labelling information on farmers' pesticide use decisions. Such investigations can identify factors that influence farmers' understanding and use of pesticide labelling information.

**Literature review**

*Pesticide Labelling Information*

A study on the effectiveness of pesticide labels as a communication tool for smallholder farmers on pesticides handling was conducted by Kapeleka & Mwaseba (2017). They used a structured interview schedule to identified factors influencing the use of information on pesticide labels and employed simple descriptive statistics and cross-tabulation for analysis (Kapeleka & Mwaseba, 2017). The study uncovered that the majority (79.6%) of farmers interviewed did not learn anything from the labels and the majority (66.7%) of farmers obtain information about pesticides from retailers (Kapeleka & Mwaseba, 2017). More than half (60%) of the farmers are unable to interpret warning symbols and pictograms correctly (Kapeleka & Mwaseba, 2017). Despite 76.1% of farmers reading pesticide labels before use, most do not comprehend the instructions provided on the label due to foreign and technical language, unclear information, and the use of uncommon Swahili words (Kapeleka & Mwaseba, 2017). The study recommends that pesticide labels should be simplified, and provide training on symbols, colour codes, pictograms, safety precautions, and the health and environmental impacts of pesticide use is crucial for farmers (Kapeleka & Mwaseba, 2017).

*Farmers' Pesticide Use Decisions*

A study on the purchasing and utilizing of pesticide among smallholder vegetable farmers in Ethiopia was conducted by Mengistie et al. (2015). A total of 220 smallholder farmers interviewed, 79% of them mentioned that the efficacy of the pesticide is the most important factor when selecting pesticides whereas 21% of them cared more about the price and if they could afford it (Mengistie et al., 2015). Pesticides cost the most for farmers when they grow tomatoes and onions, more than other things like fertilizers, workers, water pumps, or seeds (Mengistie et al., 2015). Farmers didn't really think about how dangerous pesticides might be for them or for the people who eat what they grow, or about their effects on the environment (Mengistie et al., 2015). They often bought cheaper pesticides that can kill many kinds of pests (like DDT), even though these can be harmful (Mengistie et al., 2015). Farmers usually bought small amounts of pesticides and didn't read the instructions much. For example, 67% didn't check if the pesticides were expired, and most farmers (55%) couldn't read (Mengistie et al., 2015). According to Mengistie et al. (2015), information provided by supplier can significantly impact the accurate and effective choice of pesticides, particularly for small scale farmers who lack other reliable sources of guidance. However, none of the pesticide importers had experts at the local or farm level to share information, evaluate how retailers manage products, or handle farmers' concerns. Farmers primarily rely on neighbours and their own past experiences when picking and using pesticides. Since the majority of farmers (60%) choose and use pesticides based on their own familiarity, those with over five years of farming experience are likely to be knowledgeable about available pesticide names and qualities in the market (Mengistie et al., 2015).

*Farmers' Knowledge, Attitude and Practice (KAP)*

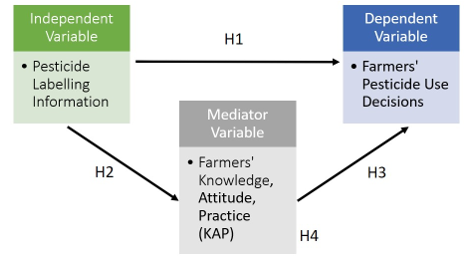
A study on the levels of knowledge, attitude and practices of Kuwaiti farmers regarding the safe use of pesticides was conducted by Jallow et al. (2017). Among 250 farmers interviewed, most farmers knew that pesticides were bad for their health (71%) and the environment (65%) (Jallow et al., 2017). Over 70% didn't read or follow the instructions on pesticide labels, and 58% didn't wear protective gear when using pesticides (Jallow et al., 2017). Educated farmers were better at using protective gear than those with less education. Around 20% of farmers stored pesticides in their living areas, which is unsafe (Jallow et al., 2017). When disposing of pesticide containers, many farmers adopted harmful practices like burying or burning them or even reuse the container. Although farmers know that pesticides are risky, they do not always act safely, with 82% of farmers reporting symptoms of acute pesticide poisoning (Jallow et al., 2017). To make things better, we need to teach farmers about safe pesticide use, enforce pesticide laws, and promote ways of controlling pests that don't involve harmful chemicals.

**research methodology**

This research will use questionnaire survey that is a type of quantitative research method involves asking respondents a series of pre-determined questions to collect data from farmers in Malaysia. This approach is useful when studying the impact of pesticide labelling information on farmers' pesticide use decisions, as it allows for the collection of large amounts of data from a series of pre-determined questions, allowing for fast and efficient collection of data from farmers in Malaysia.

*Conceptual Framework*

The conceptual framework for this study is based on the independent variable, dependent variable and mediator variable as shown in Fig. 1.



Conceptual Framework

Based on this conceptual framework, the purpose of the study is to investigate the relationship between pesticide labelling information and farmers' pesticide use decisions in the context of Malaysian agriculture. Pesticide labelling information is the independent variable that is being manipulated in the study. It refers to the information provided on pesticide labels, including the active ingredients, usage instructions, safety warnings, and other details that might influence a farmer's decision to use a particular pesticide. Farmers' pesticide use decisions are the outcome variable in this research. This variable is being measured to determine the impact of the independent variable. This variable refers to the choices that farmers make when deciding whether to use pesticides, as well as the types of pesticides they choose to use. The dependent variable could be measured in terms of the types and the frequency of pesticides used by farmers.

A mediating variable is a variable that may explain the relationship between the independent variable and dependent variable. In the context of the study, the mediating variable could be knowledge, attitude and practice (KAP).

*Data Analysis Method*

The primary data gathered from the questionnaires survey is undergone data analysis via the SMART PLS 4 software. To assess the model's outcomes, the method employed for sampling will involve the utilization of Partial Least Squares Structural Equations Modeling (PLS-SEM). It is particularly well-suited for complex research studies that involve multiple variables, as well as studies with smaller sample sizes. It is assessing the strength and significance of the relationships between variables and constructs. The factors like internal consistency (reliability) and convergent and discriminant validity are analysed to ensures that the chosen indicators accurately represent their underlying constructs.

After confirming the measurement model's validity, the structural model analysis is undergone to examine the relationships between constructs, particularly focusing on the impact of pesticide labelling information on farmers' pesticide use decisions. It calculates path coefficients, R-squared values, and other relevant statistics. To assess the statistical significance of the relationships, SMART PLS 4 uses bootstrapping. This technique generates multiple resamples from the dataset to estimate the distribution of results. It provides confidence intervals and p-values to determine whether the relationships are statistically significant. The overall fit of structural model is evaluated using goodness-of-fit measures like the Q-squared value. This indicates how well the model predicts the dependent constructs based on the independent ones.

**results**

*Structural Model*

The PLS-SEM model for this study is shown in Fig. 2 based on the research framework.

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PLS-SEM Model of the Study

*Structural Model Path Coefficients*

After PLS-SEM analysis was performed, the validity and reliability are evaluated. Then, bootstrapping is employed to determine the statistical significance of various outcomes from the PLS-SEM, such as path coefficients. These coefficients encompass key statistical measures like the mean, standard deviation, t-value, and p-value. These coefficients provide a detailed understanding of the relationships between different variables in the model and the impact they have on each other.

Structural Model Path Coefficient (Bootstrapping of 5000 samples)

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Table I presents the results from a structural model analysis using bootstrapping. Original sample (O) refers to the path coefficients calculated from the original dataset without any resampling. Sample mean (M) represents the average value of the path coefficients obtained from bootstrapping. Standard deviation (STDEV) indicates the variability or dispersion of the path coefficients across the bootstrapped samples. A higher standard deviation suggests greater variability in the estimated path coefficients. T statistics (|O/STDEV|) indicates how many standard deviations the original path coefficient is away from the mean of the bootstrapped coefficients. Larger values of T statistics suggest stronger deviations from the bootstrapped mean. P values represent the probability of observing the calculated T statistics (or more extreme values) assuming that there is no significant effect or relationship. A low p-value (usually less than 0.05) suggests that the relationship is statistically significant.

In Table I, the p-value of IV-DV is 0.173 and it is greater than 0.05 which means there is no significant relationship between Pesticide Labelling Information (IV) and Farmers' Pesticide Use Decisions (DV). In contrast, the p-value of IV-MV and MV-DV are less than 0.05, indicated the presence of a significant relationship between Pesticide Labelling Information (IV) and Farmers' Knowledge, Attitudes and Practices (MV), as well as Farmers' Knowledge, Attitudes and Practices (MV) and Farmers' Pesticide Use Decisions (DV).

*Coefficient of Determination (R2)*

Table II presents the results of the coefficient of determination (R²) analysis in this research study.

Results of Coefficient of Determination (R2)

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In Table II, both constructs Farmers' Pesticide Use Decisions (DV) and Farmers' Knowledge, Attitudes and Practices (MV) have relatively high R² values that is 0.861 and 0.725, respectively. These indicated that the model's independent variables are effective in predicting and explaining the variability in these constructs. The adjusted R² values indicate that the model fit remains strong even when considering the complexity of the model.

*Effect Size (f2)*

Table III presents the results of the effect size (f²) analysis in this research study. Effect size measures are used to understand the practical significance or magnitude of the relationships between variables.

Results of Effect Size

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In Table III, the value of 0.021 indicates a very small effect size. It shown that the Pesticide Labelling Information (IV) has a relatively minor practical impact on the variation in Farmers' Pesticide Use Decisions (DV). A larger effect size with the value of 1.399 and 2.638 indicates a stronger practical impact of Farmers' Pesticide Use Decisions (DV) on Farmers' Knowledge, Attitudes and Practices (MV) and Farmers' Knowledge, Attitudes and Practices (MV) on Pesticide Labelling Information (IV), respectively. Larger effect sizes indicate more substantial and practically significance relationships.

*Hypotheses Testing*

*H1: There is no significant relationship between pesticide labelling information and farmers' pesticide use decisions in Malaysian agriculture:* From Fig. 3 , the result of this study does not support H1, as the p value of 0.173 is greater than 0.05, indicates that there is no significant relationship between pesticide labelling information and farmers' pesticide use decisions in Malaysian agriculture.

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H1: There is no significant relationship between pesticide labelling information and farmers' pesticide use decisions in Malaysian agriculture

*H2:* *There is a significant relationship between pesticide labelling information and farmers' knowledge, attitudes and practices in Malaysian agriculture:* From Fig. 4, the result of this study has support H2, as the p value of 0 is less than 0.05, indicates that there is a significant relationship between pesticide labelling information and farmers' knowledge, attitudes and practices in Malaysian agriculture.

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H2: There is a significant relationship between pesticide labelling information and farmers' knowledge, attitudes and practices in Malaysian agriculture

*H3: There is a significant relationship between farmers' knowledge, attitudes and practices and farmers' pesticide use decisions in Malaysian agriculture:* From Fig. 5, the result of this study has support H3, as the p value of 0 is less than 0.05, indicates that there is a significant relationship between farmers' knowledge, attitudes and practices and farmers' pesticide use decisions in Malaysian agriculture.

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H3: There is a significant relationship between farmers' knowledge, attitudes and practices and farmers' pesticide use decisions in Malaysian agriculture

*H4: There is a significant difference in farmers' knowledge, attitudes and practices as a mediating influence between pesticide labelling information and farmers' pesticide use decisions in Malaysian agriculture:* From Fig. 6 and Table IV, the result of this study has support H4, as the p value of 0 is less than 0.05, indicates that there is a significant difference in farmers' knowledge, attitudes and practices as a mediating influence between pesticide labelling information and farmers' pesticide use decisions in Malaysian agriculture.

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H4: There is a significant difference in farmers' knowledge, attitudes and practices as a mediating influence between pesticide labelling information and farmers' pesticide use decisions in Malaysian agriculture

Results of Effect Size

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**Conclusion**

The study found that the information provided on pesticide labels does not strongly determine farmers' decisions to use pesticides in Malaysian agriculture. This means other factors play a more important role in their decision-making process. Several studies are consistent with this concept, emphasizing the importance of understanding label content before applying pesticides. However, there are differing views, and some studies suggest that statements about health and environmental risks on labels can influence farmers' choices.

Additionally, the study revealed a link between information on pesticide labels and farmers' knowledge of pesticides, their attitudes toward use, and the practices they adopt. This suggests that label information can shape farmers' overall awareness and perceptions of pesticide use. This concept is reinforced by previous research showing that farmers often gain their knowledge about pesticide toxicity and proper methods of application from information displayed on pesticide labels.

Furthermore, the survey showed that the interconnectedness of farmers' knowledge, attitudes, and practices regarding pesticide use significantly influences their decisions about pesticide use. This means that when farmers have good knowledge and positive attitudes toward pesticide use, their decisions tend to align with their actual practices. The complexity of this relationship is underscored by varying results from various studies. Research shows that most farmers have a moderate level of pesticide knowledge. Their attitudes toward pesticide use indicate limited concern for environmental impacts, but some demonstrate responsible practices.

In addition, the study also found that farmers' knowledge, attitude, and practice levels were an intermediary factor affecting the link between pesticide label information and farmers' decisions to use pesticides in Malaysian agriculture. This suggests that the impact of pesticide labelling information on decision-making may be achieved through its impact on farmers' overall knowledge, attitude, and practice related to pesticide use. This pattern is consistent with some previous research findings. The effectiveness of label information in promoting safe pesticide use depends on how important this information is to farmers and how effectively they incorporate it into their behaviour, attitudes and safer practices.

In summary, although pesticide label information may not be the primary driver of farmers' pesticide use decisions, this study highlights the critical role that farmers' knowledge, attitudes, and practices play in mediating the relationship between pesticide label information and decisions. This suggests that initiatives aimed at improving farmers' understanding of pesticide-related information and fostering positive attitudes and responsible practices toward pesticide use can have a more substantial impact on their decision-making processes.

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