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Influence of UTAUT, perceived compatibility, and perceived credibility on m-commerce adoption

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ABSTRACT

The adoption of mobile commerce (m-commerce) transaction is still not equal to an extremely potential market for online business in developing countries such as Malaysia. This research aims to examine the adoption of m-commerce transaction by SMEs in the service sector by extending the unified theory of acceptance and use of technology (UTAUT). Additional variables of perceived compatibility and perceived credibility were added to the traditional UTAUT which originally consisted of performance expectancy, effort expectancy, social influence, and facilitating conditions. Therefore, the purpose of this study is to examine the relationship between performance expectancy, effort expectancy, social influence, facilitating conditions, perceived compatibility and perceived credibility toward m-commerce adoption. This study implemented a quantitative approach and the data was collected from 245 SMEs who had previously used m-commerce. The result shows that performance expectancy, perceived compatibility, and perceived credibility have a significant influence on SMEs' mobile adoption, whereas effort expectancy, social influence, and facilitating conditions don't have a significant influence on SMEs' m-commerce adoption. In fact, SME owners believe that using electronic money in their business operations will improve their performance. IT professionals could intensify efforts to deploy m-commerce technology in the business organization to enhance productivity performance improvement of m-commerce transaction adoption. In fact, companies would benefit by making m-commerce transaction systems more helpful, secure, and compatible to use. By recognizing the factors that influence the adoption of m-commerce could help in addressing the challenges and barriers they present. Therefore, this research confirms the need to extend the traditional UTAUT in terms of m-commerce adoption.

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1. Introduction

Mobile internet has transformed Southeast Asia as just back then, nearly four out of five Southeast Asians did not have access to the internet. However, today mobile internet users in Southeast Asia number 360 million worldwide, making them the most engaged users (Ha and Chuah, 2023). There is about 90% of users, which means that the vast majority of mobile Internet users connect through their cell phones. Mobile Internet users also buy products, plan trips and order food online. These processes take place millions of times every day, proving that a vision that was impossible to imagine has become a daily routine of mobile phone activities. The internet economy reached $100 billion in 2019 and is expected to reach $300 billion by 2025, driven by the current trends in consumer behavior. The reason mobile Internet has succeeded in transforming Southeast Asia is that it makes the users live more convenient and productive than before by giving them unprecedented access, to information and services.

M-commerce adoption has depended significantly on e-commerce technology, and SMEs with a higher level of e-commerce have shown greater profits, earlier (Khaskheli et al., 2017). Therefore, the obvious success of e-commerce is proof of the huge potential of m-commerce adoption in the future. The government has set a target for e-commerce growth to double from 10.8% in 2016 to 20.8% in 2020, as well as a contribution to the GDP of more than 20%

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(RM211 billion) by 2020. The average GDP growth rate has been 6.1% annually from 1970 to 2018, which is higher than the average growth of advanced countries. Reportedly, e-commerce plays a significant role in the development of the digital economy by changing the trajectory of social progress and global economic expansion. Therefore, these previous studies proved the potential benefits of m-commerce for SMEs through previous e-commerce achievements and give the reason for SMEs to adopt m-commerce in their organization.

Among the important adoptions of m-commerce towards SMEs such as m-commerce able to help SMEs extend market reach, increase revenue, reduce transaction costs and intermediaries, improve the service, and create more productive staff (Yahaya et al., 2022; Khaskheli et al., 2017). In addition, this previous study also proved that the adoption of m-commerce towards SMEs has played a crucial role in marketing strategy. However, SMEs in several developing countries have not fully exploited the tremendous benefits of m-commerce activities. Moreover, it should be emphasized that despite an increase in mobile subscribers, the adoption rate of m-commerce in many developing countries is still low, especially in terms of financial transactions. The adoption of m-commerce activity is still no match with an extremely potential market for online business in developing countries such as Malaysia. In this era of globalization, SMEs need to adopt and keep pace with m-commerce advancements to face the intense competition to gain their market share. For instance, from a global comparison perspective in 2021, the penetration rates and transaction values in the mobile point-of-sale segment via smartphone show that China has reached the highest value, with 39.5%, followed by South Korea with 29.9%, Vietnam with 29.1%, Norway with 26.1%, and the UK with 20.2%. There is a global financial revolution and it is necessary for SMEs in Malaysia to follow the trend to ensure their continued growth. Therefore, it is imperative to understand the elements that influence SMEs to adopt m-commerce transaction in Malaysia, which is fundamental for marketers to consider when developing marketing strategies.

Furthermore, looking at the current scenario of COVID-19 pandemic, lack of sales and income is a major performance disruption to SMEs' cash flow which is the essence of business organizations survival due to Movement Control Order (MCO). To be worst, many merchants in Malaysia including SMEs still prefer to use cash instead of digital cash such as through mobile transaction even though it speeds up the flow of services and boost productivity performance improvement of between 26.0% to 27.0%. However, it is predicted that Malaysia will become a cashless society in 2050 including transactions through mobile channels. Therefore, it is crucial to study the factors that influence SMEs to adopt m-commerce transaction in Malaysia even though it is 29 years to reach 2050 from now. Therefore, it is essential to understand first what are the factors that support the adoption of this m-commerce usage activity of transaction.

Despite the need to keep pace with technological advancements such as m-commerce transaction in the era of globalization, SME did not show their efforts towards adopting technology in their organization because they are less adaptable to globalization pressure and unlikely to survive in the current situation. In addition, SMEs do not find it easy to adopt mobile transaction. If SME do not find it easy to adopt mobile transaction, they will have low expectations towards acquiring the expected performance as well. Therefore, this problem strengthened the reason SMEs in several developing countries such as Malaysia have not been fully utilized the tremendous benefit of m-commerce activities, especially in terms of mobile transaction. However, the mobile transaction is supposed to be easy to use because, for example, SMEs are able to transact payment directly to their suppliers or customers through mobile phones in the palm of their hands without the need to leave their premises and go through a bank. Besides, the m-commerce transaction also enhanced various transactions that can be offered through banks or registered agents. The previous researchers also believe that the emergence of m-commerce transaction is playing critical role in economic development because this technology not only provides local transactions but also international transaction. Thus, in light of the foregoing, this study sought to determine the factors influencing the adoption of m-commerce transactions among SMEs. Although developing countries are full of technologically savvy citizens, but does not optimize the use of the potential of m-commerce especially among SMEs, because there is no influence on the intention to engage in mobile transactions by others or in social circles. In other words, since social influence is not associated with the transaction in the previous study, the m-commerce usage activity of the transaction is not influenced by his or her friends. In order to increase the usage of m-commerce potential in Malaysia, simply focusing on individual perceptions without involving others may not be enough. However, there is rapid growth of online sales and more than 50% of e-commerce transaction comes from purchases via smartphones in South Africa. Therefore, the COVID-19 pandemic is not only causing major disruptions to the cash flow of SMEs, it is reshaping the world. This means that there is no return to the old normal, which is likely to be followed by other disruptive changes such as social changes due to the adherence to social distancing and lockdown regulations. People prefer to move from offline transactions to online transactions. In addition, because it has the potential to surpass the performance of e-commerce, m-commerce has attracted attention. Therefore, it is important to optimize the use of m-commerce's potential among SMEs through social influence which involves a network of people or community. This is the reason for current study to investigate the

factor of social influence towards m-commerce usage activity of transaction.

Among the reasons for the slow growth of SMEs and preventing them from expanding and growing is the lack of facilitating conditions as discussed by previous studies reflect the resources, knowledge owned, and perceived importance of organizational and technical infrastructure to support m-commerce (Albashrawi and Motiwalla, 2020; Venkatesh et al., 2003; Madan and Yadav, 2018). In particular, facilitating conditions related to the lack of access to financial resources, are considered unviable by the formal financial sector because the transaction sizes of SMEs are small. However, in order to facilitate the financial transaction, the bank even provided the mobile banking application. In addition to mobile banking applications, the government has invested in m-commerce transactions, services, and equipment for SMEs because of the market potential. The government has realized this opportunity due to the increasing number of mobile phone users which has presented opportunities for SMEs to adopt m-commerce transaction. It may cost up to many billions of dollars, or perhaps tens of billions in some cases, to build and develop the infrastructure needed for m-commerce activities in Malaysia. Therefore, it is crucial to ensure that SMEs take advantage of these opportunities and turn the potential of m-commerce transactions into financial rewards because a lot of time and money has been invested in m-commerce activities.

When compatibility problems occur (Rana et al., 2019), the business's current operations or technology may not sufficiently complement mobile commerce. Issues with compatibility include the degree of compatibility with an organization's technological features, as well as the customization of current apps to m-commerce transactions, and compatibility of payment facilities. Apart from the low computational capacity discussed above, in terms of mobile-based transaction technology, SMEs are having poor and slow network connectivity challenges as well. Network connectivity is a major issue for SMEs because it can be difficult for more business units to use mobile transactions because good network connectivity is typically restricted to a small number of urban locations. Furthermore, Wei et al. (2009) explained how mobile devices are used to connect wirelessly in a mobile environment for m-commerce transactions. Because mobile devices must move constantly with the user and rely on wireless networks to connect with those outside the device, this technical issue is becoming worse.

Despite this lack of compatibility issues can be among the barriers of m-commerce (Rana et al., 2019), however, m-commerce is a perfect choice for conducting mobile transactions by allowing transactions anywhere and at any time (Yap and Hii, 2019). In a similar vein, acceptance of compatibility would imply that mobile commerce is always available and properly supported by appropriate ambient factors. For example, m-commerce allows a simple transaction which is money transfer through SMS. These also proved that using m-commerce transaction can be convenient for SMEs' dynamic business operation and improve productivity as well as compatible with the technology enable anytime-anywhere transaction. Moreover, the idea of anytime-anywhere transactions is considered one of the major benefits of mobile commerce that attracts businesses. In addition, the adoption of m-commerce can help SMEs overcome a number of obstacles they may face during COVID-19, such as face-to-face interactions, demand forecasting, increasing overall sales and turnover, market access, and more. Therefore, it is important that draw attention to study the influence of perceived compatibility of m-commerce transaction adoption in Malaysian SMEs in order to optimize the use of the potential of m-commerce among them.

Previously, the problem of reluctance to use online transactions occurred because of a lack of perceived credibility (Tarhini et al., 2016) among SMEs. Besides, the uncertainty about security protection discussed above also contributed to the problem of lack of perceived credibility in mobile transactions particularly among SMEs. This is because according to previous studies, perceived credibility will be achieved only when there are no security and privacy concerns or threats, especially in m-commerce transaction adoption. Perceived credibility is crucial based on the fact that m-commerce transaction is in mobile environments and as more people including SMEs use mobile devices to pay bills, transfer money, and others, the mobile threat perceptions are increasing. Perceived credibility is an important factor when SMEs decide to implement m-commerce transactions and it is understandable since their personal and banking information are connected to m-commerce transactions. Furthermore, perceived credibility offers a safe and secure virtual environment (Tarhini et al., 2016) that allow SMEs to make full use potential of mobile transaction. In addition, SMEs must believe that their transaction can be completed with credibility and safely in m-commerce transactions. Therefore, in order to ensure that m-commerce transaction adoption is fully used by SMEs, it becomes imperative to understand the factors influencing m-commerce transaction adoption among them.

In summary, the aforementioned discourse highlights the pertinent challenges associated with the adoption of m-commerce transactions within the SME realm, which may hinder their ability to fully capitalize on the benefits of m-commerce transactions. The rationale outlined here enables this research to fill empirical gaps in the existing academic literature. This is achieved by examining the determinants influencing the adoption of m-commerce transactions from the perspective of SMEs, employing six critical factors: performance expectancy, effort expectancy, social influence, facilitating conditions, perceived compatibility, and perceived credibility.

2. Background and literature review

2.1. Mobile commerce

In the beginning of the evolution technology, electronic commerce (e-commerce) provides a convenient means of buying and selling goods on the Internet before the emergence of new technology mobile commerce (m-commerce). In addition, e-commerce also contributed to the emergence of m-commerce as a new-wave technology. This explains the reason the word "m-commerce" itself comes from the word "e-commerce" (Rana et al., 2019).

Previous studies indicated that m-commerce adoption arguably has high potential and provide vast opportunities for business and consumers in developing country through SMEs. Malaysia outperforms most of the ASEAN countries, as well as Japan and Korea on this positive trend. However, most of the SMEs in developing countries have failed to reap the benefits offered by modern m-commerce technology adoption. As an example, there are several previous researchers found that the adoption rate of mobile commerce remains low and does not reach the level of sophistication in Malaysia compared with other nations such as Korea, Japan, and Singapore (Yap and Hii, 2019). Despite the m-commerce low adoption issue as reported in the recent studies above, m-commerce adoption is on the rise taking over the pattern of Malaysia's economy and assisting Malaysia to reach high-income status by 2024. Therefore, these debatable concerns have proven the gap to conduct the current study toward m-commerce adoption, specifically the aim of this study is to investigate factors that may enhance the adoption of m-commerce among Malaysian SMEs.

2.2. Mobile commerce adoption

In information systems, there is a growing academic research body exploring computer technology acceptance and adoption factors. As a result, the process of technology adoption has been extensively investigated. When the technology acceptance process has begun, the user starts to have intentions of using the technology. As a consequence, adoption of technology occurs when it is accepted and used. Technology acceptance and adoption are often considered to be the same concept. The present study examined factors pertaining to m-commerce adoption towards SMEs.

In order to inspect the user's acceptance of m-commerce, some initiative needs to be taken to ensure that the m-commerce users are engaged in conducting all kinds of mobile payment services with their own mobile device. This study describes that m-commerce adoption is the only way to ensure that users can realize and enjoy the incredible benefits of m-commerce services which are ubiquitous, personalization, versatility, convenience, and so on, and without adoption construct the full utility and potential of m-commerce cannot be achieved. M-commerce is a very important part of business now, as Yap and Hii (2019) asserted that it is a strategic tool for SMEs. However, this study shows that not all SMEs implement m-commerce for conducting their business transactions. There is, for example, a problem with the conventional mindset that the use of technologies belongs only to large-scale businesses in the study conducted on SMEs in East Java, Indonesia (Yap and Hii, 2019). The problem is among the factors preventing the application of m-commerce.

Besides, even though the penetration rate of mobile phone reach more than 200% but adoption of m-commerce is not that significant. Similarly, the level of awareness of m-commerce is high which is 76.8%. However, the awareness of m-commerce and experience using m-commerce are weak and related to the intention to use and adopt. Besides, 100% of the respondents own at least a mobile phone. However, their m-commerce adoption rate is low is 29.3% and one of the reasons is majority of them do not adopt mobile phones for monetary transaction purposes. Yap and Hii (2019) examined activities related to online transactions accessed via internet-based mobile devices including laptops, smartphones, iPads, and Androids under various brands. The previous study revealed that mobile devices are not supported by m-commerce services. It means, for example, that the application does not meet one of the criteria for m-commerce, namely personalization when the layout for m-commerce transactions does not appear perfectly on mobile devices.

Therefore, establishing an excellent and widely adopted m-commerce environment remains ambiguous. As a result of the exponential growth of smartphones induced by iPhone and Android, the situation is changing today, and m-commerce adoption potential cannot remain ambiguous. For m-commerce to reach its full potential, it is required to understand the underlying factors driving its adoption and acceptance. In addition to that, SMEs will consider the financial sector first when adopting m-commerce. Thus, if the adoption of m-commerce does not appear to bring a profit or financial benefit, even when there are complete facilities available, SMEs will be reluctant to adopt it (Yap and Hii, 2019).

The majority of previous studies focused on understanding m-commerce technology in general terms. Additionally, several previous studies have been conducted but only focused on content delivery and user control, such as the enhancement of mobile capacity through generic and efficient resource sharing and Osman's (2016) ad hoc wireless data transmission model for mobile e-commerce. However, there is very little research on SME perceptions of the acceptance of m-commerce, even though Chye (2012) pointed out that SMEs account for two-thirds of economic activity in services sectors in most OECD countries. Hence, it is necessary to have an understanding of the acceptance of m-commerce among Malaysian SMEs.

In the interest of filling these gaps, this study measures the adoption of m-commerce by SMEs.

Using an empirical investigation, Dwivedi et al. (2017) found that their suggested theoretical model, which revises the ideas of the original UTAUT model, can serve as a relevant alternative to understanding information systems or information technology acceptance and adoption. Besides, other previous research related to m-commerce adoption in countries such as Malaysia, Pakistan, the United Kingdom, and Spain (Farah et al., 2018; Dwivedi et al., 2017; Sultana, 2020; Palau-Saumell et al., 2019). In conclusion, in the context of the current study m-commerce adoption is operationalized as whether people accept or reject m-commerce adoption. In order to suit the current study context, the term m-commerce adoption used in this study is conceptualized as m-commerce usage activity of transactions. The transaction involves performing routine banking services such as paying bills and checking account balance and financial transaction which is to transfer money from a preconfigured bank account using wireless internet via mobile device. This current study embraces the m-commerce usage activities of transactions empirically implemented and validated by many previous researchers (Luqman et al., 2016).

2.3. Unified theory of acceptance and use of technology (UTAUT)

Initially, Venkatesh et al. (2003) weighed up and synthesized eight theories of technology adoption resulting in the unified model called UTAUT. In searching for the strongest IT acceptance model, the previous associated studies were reviewed and went through empirical study where several elements of the eight behavioral intention models were incorporated. These mentioned eight behavioral intention models are the theory of reasoned action (TRA), the technology acceptance model (TAM), the motivational model (MM), the theory of planned behavior (TPB), the combined TAM-TPB, the model of PC utilization (MPCU), the innovation diffusion theory (IDT), and the social cognitive theory (SCT). Thus, after going through analyzing and comparing the structured aforementioned models, Venkatesh et al. (2003) suggested UTAUT, a combined model which able to explain 70% of user behavioral intention to adopt technology variance and about 50% of the variance in technology use.

The UTAUT integrated constructs over eight models and provided a refined understanding of the evolution of intention and behavior over time (Venkatesh et al., 2003). UTAUT can account better than any of the eight models alone. The UTAUT model is suitable to be implemented in this current research. This is because this model provides theoretically and empirically relevant variables that report the acceptance of information technology (Venkatesh et al., 2003; Blaise et al., 2018). Based upon Min et al. (2008), the UTAUT model is the most thorough with an immense range of factors and effective explanation as presented by Venkatesh et al. (2003). Thus, as this model is well established in investigating the intention to adopt m-commerce, the current study has selected it as the independent variable to investigate the relationship towards m-commerce adoption among SMEs in the service sector.

UTAUT consists of four constructs which are performance expectancy, effort expectancy, social influence, and facilitating conditions which influence behavioral intention to use a technology and/or technology use (Venkatesh et al., 2012). All four UTAUT variables are different and consist of unique characteristics. The next sub-section will further elaborate on all dimensions of UTAUT as mentioned above including the additional variables.

3. Research model and hypotheses

In Fig. 1, the suggested research model is displayed. The next paragraphs provide descriptions of the constructs and hypotheses.

3.1. Performance expectancy

In the context of the current study, performance expectancy is a person's belief that they will benefit in performance when using m-commerce and that m-commerce will help them maximize efficiency and productivity (Albashrawi and Motiwalla, 2020). Overall, performance expectancy and adoption have been demonstrated and approved (Yap and Hii, 2019; Farah et al., 2018; Sultana, 2020). Therefore:

H1: There is a positive significant relationship between performance expectancy and m-commerce adoption.

3.2. Effort expectancy

In the context of the current study, effort expectancy is one that thinks that employing m-commerce services will be completely effortless (Kwok, 2015). Most of the previous studies on effort expectancy and adoption behavior have been proven and recognized by past studies (Yap and Hii, 2019; Farah et al., 2018; Sultana, 2020). Therefore:

H2: There is a positive significant relationship between effort expectancy and m-commerce adoption.

3.3. Social influence

In the context of the current study, social influence technology is about how important others think consumers should use mobile commerce, and the decisions to adopt it are influenced by others (Kwok, 2015). The majority of the previous studies have pointed out that social influence has been a significant factor in predicting adoption, as there

have been numerous studies showing this association in the past (Farah et al., 2018). Therefore:

H3: There is a positive significant relationship between social influence and m-commerce adoption.

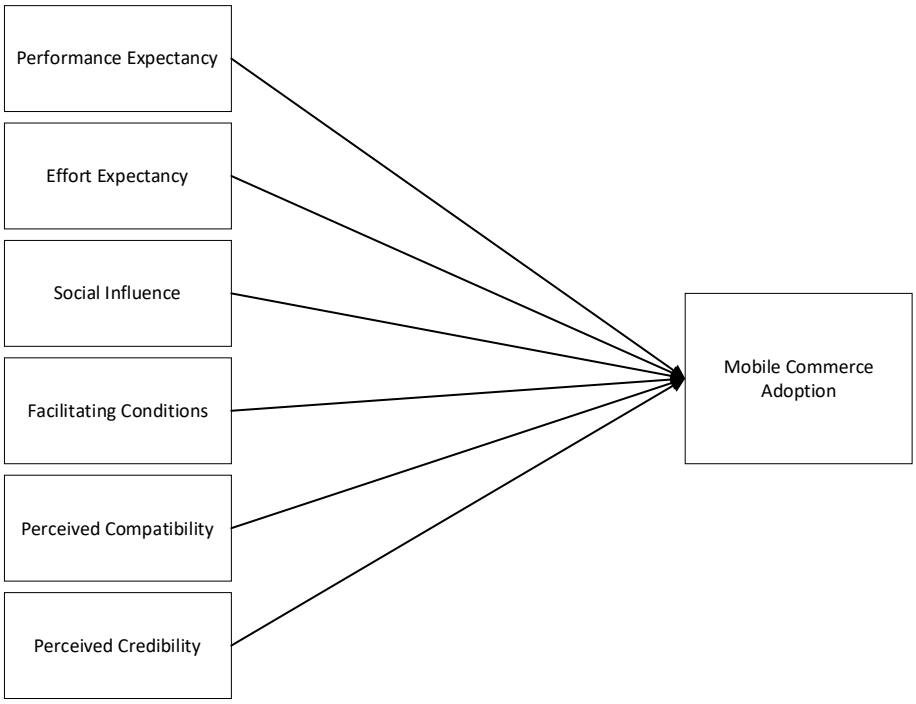


Fig. 1: Research framework

3.4. Facilitating conditions

In the context of the current study, facilitating conditions reflect the user's resources and knowledge, and the user's agreement to make an action easy to complete, including by offering computer assistance (Venkatesh et al., 2003). Prior studies have mostly emphasized the importance of enabling and facilitating conditions for adoption (Dwivedi et al., 2017). Therefore:

H4: There is a positive significant relationship between facilitating conditions and m-commerce adoption.

3.5. Perceived compatibility

Perceived compatibility is defined as the extent to which m-commerce transaction is consistent with the existing technology infrastructure, culture, values, and preferred work practices of SMEs. Most of the earlier research on perceived compatibility and adoption has been demonstrated and approved (Alam et al., 2018). Therefore:

H5: There is a positive significant relationship between perceived compatibility and m-commerce adoption.

3.6. Perceived credibility

Privacy and security protection are the definitions of perceived credibility in the current study and Salimon et al. (2018) reported that users of m-commerce have reduced or avoided the platform because of security risks and fear of losing money and other valuable data. Thus, perceived credibility serves the purpose of this current study. Additionally, most of the previous studies on perceived credibility and adoption have been proven and recognized. As a result of the literature review, the following hypothesis has been developed between perceived credibility and m-commerce adoption.

H6: There is a positive significant relationship between perceived credibility and m-commerce adoption.

4. Methodology

It is deemed appropriate and suitable method that a quantitative approach be implemented in this study to examine the relationship between UTAUT variables which are, performance expectancy, effort expectancy, social influence, facilitating conditions, perceived compatibility, and perceived credibility towards m-commerce adoption among Malaysian SMEs (Yahaya et al., 2022; Mahad, 2015; Kwok, 2015). The current study focuses on improving UTAUT at the organizational level. This research uses cluster sampling with a proportional technique. The study is applied to SME firms in the service industry which dominated by sub-sectors of wholesale and retail trade, food and beverages, and accommodation. The questionnaires were administered towards SMEs in Kuala Lumpur and Selangor. In this study, the population of interest is

the SME Corporation Malaysia as listed in the National Entrepreneurs Directory 2020. Since SME Corp. Malaysia recognizes the National Entrepreneurs Directory, it was ultimately picked as a sampling frame. SME Corp website is previously has been widely used (Yahaya et al., 2022; Alam et al., 2018; Mamun, 2018; Zur and Syukor, 2018; Hashim, 2019).

Out of a total of 400 surveys, respondents completed and returned 261 in total. To achieve this response rate, emails, WhatsApp messaging, phone calls, and short message service (SMS) messages were made as follow-ups and polite reminders to return completed forms. Nevertheless, 16 of the 261 completed questionnaires could not be used because they were incomplete, and several of the respondents lacked cooperation. There are 245 legitimate questionnaires in total, which is a valid response rate of 61.25% and is regarded as sufficient for analysis.

5. Data analysis

The statistical analyses of data are described in the paragraphs that follow.

5.1. Validity and reliability

Assessment of the measurement model is the process of evaluating the measurement model's validity and reliability (Hair et al., 2019). Validity tests look at how well an instrument captures the specific concept it is intended to measure, whereas reliability relates to the consistency or stability of the measure or scale. Table 1 displays the discriminant validity, convergent validity, internal consistency reliability, and individual item reliability. Table 1 demonstrates that items with AVEs reaching 0.50 will be kept.

Table 1: Result of measurement model (reliability)

Constructs	Cronbach's alpha (CA)	Composite reliability (CR)	Average variance extracted (AVE)
Performance expectancy	.971	.977	.895
Effort expectancy	.973	.980	.925
Social influence	.966	.975	.908
Facilitating conditions	.966	.973	.856
Perceived compatibility	.969	.975	.888
Perceived credibility	.872	.914	.726
M-commerce adoption	.950	.964	.870

Table 1 demonstrates that the current study's composite dependability index values vary from 0.726 to 0.980. In the event where 0.70 is the composite reliability index or greater, the construct dependability is deemed satisfactory (Hair et al., 2019). However, if the AVE value is 0.50, the researchers might keep items with loading that is less than 0.70. In other words, the researchers can still maintain items with a minimal loading of 0.70 even if the AVE value does not exceed 0.50. The evidence supporting the individual item and concept reliability has been presented in Table 1.

Besides, each latent construct's convergent validity was investigated using average variance extracted (AVE) from the study. Based on Table 1, the AVE values ranged from 0.726 to 0.925, which is considered sufficient (Hair et al., 2019). These values are higher than recommended and indicate that these latent variables explain more than half of the variance of its indicators on average (Hair et al., 2019).

5.2. Discriminant validity

Next, the discriminant validity of constructs was examined. Table 2 displays the discriminant validity. This study established discriminant validity using the Fornell-Larcker criterion.

Table 2: Discriminant validity

	A	PE	EE	SI	FC	PCM	PC
A	.933						
PE	.820	.946					
EE	.811	.889	.962				
SI	.801	.906	.928	.953			
FC	.789	.849	.900	.907	.925		
PCM	.839	.808	.846	.844	.868	.943	
PC	.787	.702	.743	.737	.797	.853	.852

Diagonal elements are the square roots of the variance shared between the constructs and their measures (AVE) while off-diagonal elements are the correlations among constructs

Since AVEs have larger square roots than correlations across components, Table 2 demonstrates that the study's discriminant validity has been established adequately. The structural model was evaluated, and the fit index standardized root mean square residual (SRMR) was used to evaluate the fit of the present model. The SRMR value is 0.04 as shown in Table 3 which indicates that the present model has adequate model fit. Fig. 2 presents the structural model graph.

Table 3: Model fit summary

SRMR	0.040
Coefficient of determination (R square)	0.782
Adjusted R square	0.774
Sig	<0.01

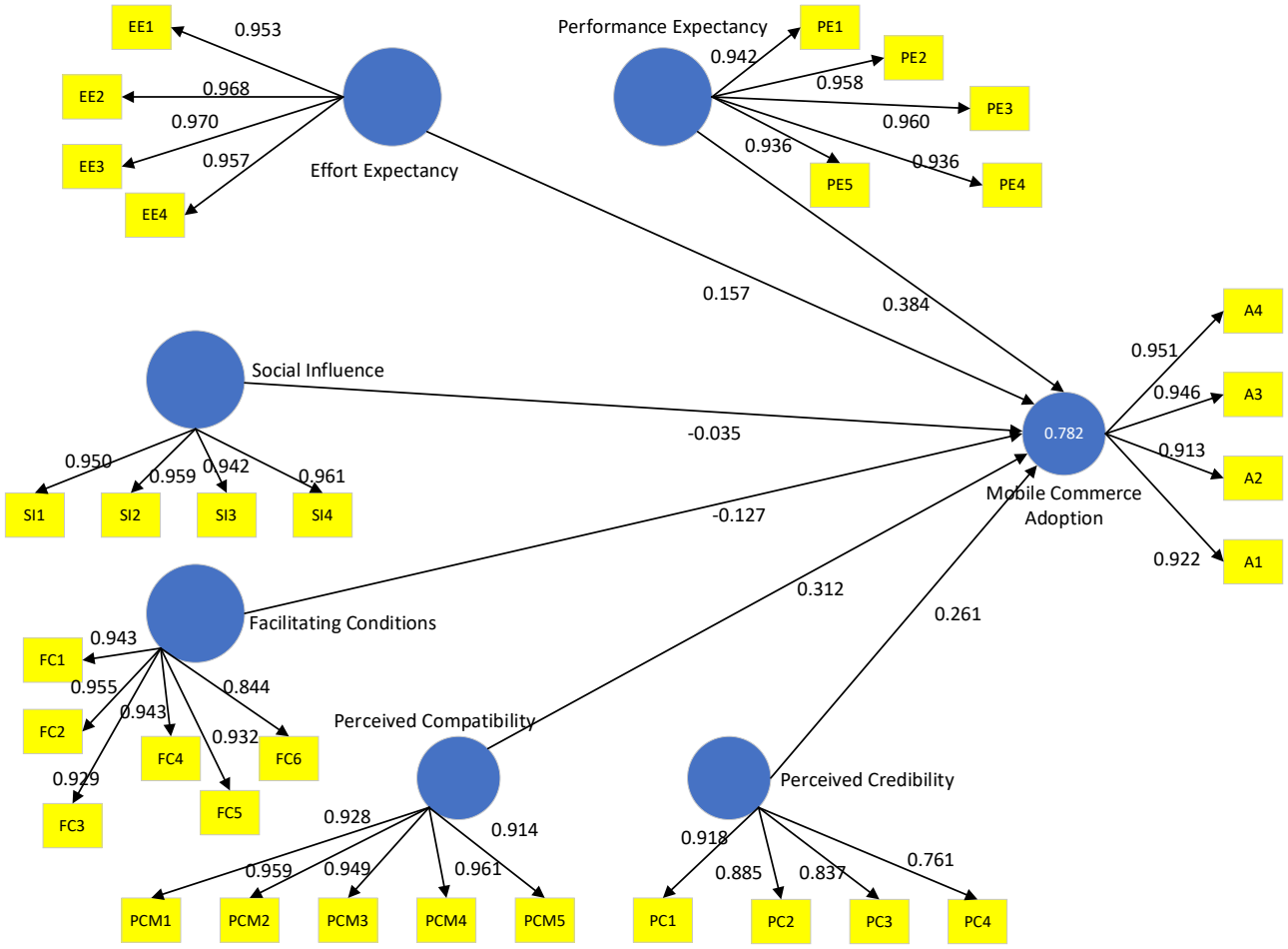


Fig. 2: Structural model graph

6. Results and discussion

Concerning the significance of the structural path, six hypotheses were formulated and tested. Table 4 presents the results.

Based on this study, H1, H5, and H6 reported the positive relationship between performance expectancy, perceived compatibility, and perceived credibility toward m-commerce adoption. However, H2, H3, and H4 are not supported because effort expectancy, social influence, and facilitating conditions were reported to have no positive relationship with m-commerce adoption. The factors of PE, PCM, and PC were found to have a significant positive influence on A. This is supported by several previous studies such as in Yogyakarta, Indonesia, Gunawan et al. (2019) found that acceptance and use behavior are directly linked to the performance expectancy among micro, small, and medium enterprises (MSME). According to a previous study, MSME owners feel that using e-money in their business operations will improve their performance. Besides, Yap and Hii (2019) indicated SMEs in Indonesia have high expectations for adopting m-commerce for helping tasks, finishing tasks, and improving performance. Whereas Kurnia et al. (2015) proved that perceived compatibility is the critical factor for m-commerce adoption in organizations. Chopdar and Sivakumar (2018) conclude that retailers and stakeholders must improve security in transactions and privacy protection, to enhance the credibility of m-commerce adoption.

Table 4: Result of structural model assessment

Hypothesis	Relationship	Standard deviation	t-values	p-values	Decisions
H1	PE->A	.157	2.445	.015	Supported
H2	EE->A	.155	1.017	0.310	Rejected
H3	SI->A	.177	.195	.845	Rejected
H4	FC->A	.151	.842	.401	Rejected
H5	PCM->A	.155	2.014	.045	Supported
H6	PC->A	.123	2.117	.035	Supported

PE: Performance expectancy; EE: Effort expectancy; SI: Social influence; FC: Facilitating conditions; PCM: Perceived compatibility; PC: Perceived credibility

Whereas EE, SI, and FC were the factors discovered not to have a significant influence on the A. The model, which aids in understanding the factors impacting SMEs' decision-making processes regarding the adoption and maintenance of mobile commerce, has been empirically confirmed by the current research. In line with this study, Mensah et al. (2022) found that effort expectancy does not

influence mobile adoption. This previous study added that the reason is because of the advanced technology savvy of respondents along with its long usage and they become skilled at the use of technology-related applications which make them able to have easy access to mobile commerce technology. In other words, the issue of ease of use accompanying the use of mobile commerce becomes less of a challenge. Besides, Wong et al. (2020) findings showed that social influence does not affect mobile adoption in Malaysia. Considering that social influence was not directly correlated to the intention of people towards mobile adoption, the motivation of SMEs in adopting m-commerce is not always related to the influence of business partners, competitors, or organizational support because educational background becomes one of the capital for SMEs in gaining information related to m-commerce (Yap and Hii, 2019). This study's findings aligned with a previous study from Yap and Hii (2019) which found that despite SME owners showing positive responses toward knowledge, equipment, and references from the Chamber of Commerce and Industry, these responses towards facilitating conditions did not affect them to adopt m-commerce directly. The reason because SMEs will first consider financial factors. In other words, when the adoption of m-commerce does not bring profit or financial benefit even in the presence of complete facilities, the SMEs will be reluctant to adopt it (Yap and Hii, 2019).

7. Conclusion and implication

This study proposed an integrated UTAUT to examine the use of mobile commerce by Malaysian SMEs. Perceived compatibility and perceived credibility were included as additional variables to the classic UTAUT model. The findings of this study on all six antecedents (performance expectancy, effort expectancy, social influence, facilitating conditions, perceived compatibility, and perceived credibility) provide a new perspective on the adoption of m-commerce among SMEs. The factors of PE, PCM, and PC were found to have a significant positive influence on A. Whereas EE, SI, and FC were the factors discovered not to have a significant influence on A. This study serves as an example of the practical considerations that SME firms found significant when deciding whether to use mobile commerce, especially as a fundamental for marketers to consider when developing marketing strategies. These results can aid businesses in improving the layout of their mobile interface to best fit the functions that customers think are crucial in deciding whether to use m-commerce. Since PE, PCM, and PC were found to have a positive impact on m-commerce adoption, hence, IT professionals might intensify the effort of deploying m-commerce technology in business organizations to boost productivity performance improvement of m-commerce transaction adoption. In fact, businesses would benefit from m-commerce transaction systems becoming more helpful and making the procedure secure and compatible to use. Besides, this study will present a strong ramification to fulfill the SME Masterplan strategic goals in order to create globally competitive SMEs for a prosperous nation's economy and social welfare. Recognizing the factors that influence the adoption of m-commerce might help in addressing the challenges and barriers they present. Furthermore, due to the scarcity of empirical studies on m-commerce adoption among SMEs in Malaysia, this research is anticipated to provide scholarly information and authoritative sources of educational material to carry out additional research projects.

Compliance with ethical standards

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

References

Alam SS, Nor NGM, Ali MH, Omar NA and Wel CAC (2018). Relationship between entrepreneur's traits and cloud computing adoption among Malay-owned SMEs in Malaysia. Cuadernos de Gestión, 18(2): 115-132. https://doi.org/10.5295/cdg.140515ss

Albashrawi M and Motiwalla L (2020). An integrative framework on mobile banking success. Information Systems Management, 37(1): 16-32. https://doi.org/10.1080/10580530.2020.1696530

Blaise R, Halloran M, and Muchnick M (2018). Mobile commerce competitive advantage: A quantitative study of variables that predict m-commerce purchase intentions. Journal of Internet Commerce, 17(2): 96-114. https://doi.org/10.1080/15332861.2018.1433911

Chopdar PK and Sivakumar VJ (2019). Impulsiveness and its impact on behavioural intention and use of mobile shopping apps: A mediation model. International Journal of Business Innovation and Research, 19(1): 29-56. https://doi.org/10.1504/IJBIR.2019.099754

Chye LT (2012). Entrepreneurial orientation and managerial competence: Are they complementary or contradictory to SME performance in Malaysia. Ph.D. Dissertation, University of Newcastle, Newcastle, Australia.

Dwivedi YK, Rana NP, Jeyaraj A, Clement M, and Williams MD (2019). Re-examining the unified theory of acceptance and use of technology (UTAUT): Towards a revised theoretical model. Information Systems Frontiers, 21(3): 719-734. https://doi.org/10.1007/s10796-017-9774-y

Farah MF, Hasni MJS, and Abbas AK (2018). Mobile-banking adoption: Empirical evidence from the banking sector in Pakistan. International Journal of Bank Marketing, 36(7): 1386-1413. https://doi.org/10.1108/IJBM-10-2017-0215

Gunawan H, Sinaga BL, and WP SP (2019). Assessment of the readiness of micro, small and medium enterprises in using e-money using the unified theory of acceptance and use of technology (UTAUT) method. Procedia Computer Science, 161: 316-323. https://doi.org/10.1016/j.procs.2019.11.129

Ha H and Chuah CP (2023). Digital economy in Southeast Asia: Challenges, opportunities and future development. Southeast Asia: A Multidisciplinary Journal, 23(1): 19-35. https://doi.org/10.1108/SEAMJ-02-2023-0023

Hair JF, Risher JJ, Sarstedt M, and Ringle CM (2019). When to use and how to report the results of PLS-SEM. European Business Review, 31(1): 2-24. https://doi.org/10.1108/EBR-11-2018-0203

Hashim AB (2019). Leadership behaviour, entrepreneurial orientation and organisational performance in Malaysian small and medium enterprises. Ph.D. Dissertation, Sultan Idris Education University, Perak, Malaysia. https://doi.org/10.5539/ibr.v11n9p37

Khaskheli A, Jun Y, and Bhuiyan MA (2017). M-commerce and mobile apps: Opportunities for MSMEs in developing countries. Marketing, 2(2): 20-23. https://doi.org/10.18775/jibrm.1849-8558.2015.22.3003

Kurnia S, Choudrie J, Mahbubur RM, and Alzougool B (2015). E-commerce technology adoption: A Malaysian grocery SME retail sector study. Journal of Business Research, 68(9): 1906-1918. https://doi.org/10.1016/j.jbusres.2014.12.010

Kwok M (2015). Examining factors affecting adoption of mobile commerce by young consumers in China. Ph.D. Dissertation, Faculty of Business and Law, University of Newcastle, Newcastle, Australia.

Luqman A, Razak RC, Ismail M, and Alwi MAM (2016). The influence of individual characteristics in predicting mobile commerce usage activities' continuance intention. Journal of Entrepreneurship and Business (JEB), 4(2): 54-69. https://doi.org/10.17687/JEB.0402.05

Madan K and Yadav R (2018). Understanding and predicting antecedents of mobile shopping adoption: A developing country perspective. Asia Pacific Journal of Marketing and Logistics, 30(1): 139-162. https://doi.org/10.1108/APJML-02-2017-0023

Mahad M (2015). Factors influencing the acceptance of mobile banking services among students of higher education at Klang Valley in Malaysia. Ph.D. Dissertation, Universiti Utara Malaysia, Kedah, Malaysia.

Mamun AA (2018). Diffusion of innovation among Malaysian manufacturing SMEs. European Journal of Innovation Management, 21(1): 113-141. https://doi.org/10.1108/EJIM-02-2017-0017

Mensah IK, Zeng G, and Mwakapesa DS (2022). The behavioral intention to adopt mobile health services: The moderating impact of mobile self-efficacy. Frontiers in Public Health, 10: 1020474. https://doi.org/10.3389/fpubh.2022.1020474 **PMid:36238232 PMCid:PMC9553028**

Min Q, Ji S, and Qu G (2008). Mobile commerce user acceptance study in China: a revised UTAUT model. Tsinghua Science and Technology, 13(3): 257-264. https://doi.org/10.1016/S1007-0214(08)70042-7

Osman H (2016). A trading model and security regime for mobile e-commerce via ad hoc wireless networking. Ph.D. Dissertation, Heriot-Watt University, Edinburgh, UK.

Palau-Saumell R, Forgas-Coll S, Sánchez-García J, and Robres E (2019). User acceptance of mobile apps for restaurants: An expanded and extended UTAUT-2. Sustainability, 11(4): 1210. https://doi.org/10.3390/su11041210

Rana NP, Barnard DJ, Baabdullah AM, Rees D, and Roderick S (2019). Exploring barriers of m-commerce adoption in SMEs in the UK: Developing a framework using ISM. International Journal of Information Management, 44: 141-153. https://doi.org/10.1016/j.ijinfomgt.2018.10.009

Salimon M, Mokthar S, Yusr M, Yusoff R, Kareem O, and Bamgbade J (2018). Do risk and fun matter in the adoption of mobile commerce in Nigeria? APLS-SEM approach. Management Science Letters, 8(6): 507-518. https://doi.org/10.5267/j.msl.2018.5.004

Sultana J (2020). Determining the factors that affect the uses of mobile cloud learning (MCL) platform blackboard-A modification of the UTAUT model. Education and Information Technologies, 25(1): 223-238. https://doi.org/10.1007/s10639-019-09969-1

Tarhini A, El-Masri M, Ali M, and Serrano A (2016). Extending the UTAUT model to understand the customers' acceptance and use of Internet banking in Lebanon: A structural equation modeling approach. Information Technology and People, 29(4): 830-849. https://doi.org/10.1108/ITP-02-2014-0034

Venkatesh V, Morris MG, Davis GB, and Davis FD (2003). User acceptance of information technology: Toward a unified view. MIS Quarterly, 27(3): 425-478. https://doi.org/10.2307/30036540

Venkatesh V, Thong JY, and Xu X (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. MIS Quarterly, 36(1): 157-178. https://doi.org/10.2307/41410412

Wei TT, Marthandan G, Chong AYL, Ooi KB, and Arumugam S (2009). What drives Malaysian m-commerce adoption? An empirical analysis. Industrial Management and Data Systems, 109(3): 370-388. https://doi.org/10.1108/02635570910939399

Wong SM, Leong CM, and Puah CH (2020). Mobile Internet adoption in Malaysian suburbs: The moderating effect of gender. Asian Journal of Business Research, 9(3): 90-114. https://doi.org/10.14707/ajbr.190069

Yahaya S, Hamid SNA, and Nafi SNM (2022). Determinants for m-commerce adoption in Malaysian SMEs: A conceptual framework. International Journal of Business and Economy, 4(1): 138-149.

Yap CS and Hii JWH (2009). Factors affecting the adoption of mobile commerce in Malaysia. IUP Journal of Information Technology, 5(3): 24-37.

Zur R and Syukor SA (2018). Mass customization practices of Malaysian SMEs apparel sector: An exploratory survey. In the Customization 4.0: Proceedings of the 9th World Mass Customization and Personalization Conference, Springer International Publishing, Aachen, Germany: 657-669. https://doi.org/10.1007/978-3-319-77556-2_42