



**Malaysian SMEs M-Commerce Adoption: TAM 3, UTAUT 2
and TOE Approach.**

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Abstract

Purpose: The primary objective of this study is to examine the factors that influence Malaysian Small and Medium Enterprises (SMEs) to adopt mobile commerce by integrating the constructs of Technology Acceptance Model 3, Universal Theory of Acceptance and Use of Technology 2, and Technology-Organization-Environment model. Though numerous mobile commerce adoption studies have been conducted, lesser attention is paid to how hedonic motivation can influence organizational users such as SMEs. This study bridges the gap by integrating the three models to provide a new lens to guide SMEs.

Methodology: To examine the factors that influence the adoption of mobile commerce, the researchers collected data from Small and Medium Enterprises in Malaysia using an online survey. The sample size of the participants was determined through the available list provided by SME Corp Malaysia. The researchers also used Krejcie and Morgan's sample size and G*Power techniques to determine that the sample size was appropriate. The data collected were analyzed using Partial Least Square- Structural Equation Modelling.

Finding: The findings of this study reveal that technological factors (computer self-efficacy, result demonstrability, computer anxiety) positively and significantly influence mobile commerce adoption. Likewise, the organizational/environmental factors (mobile commerce knowledge, pressure from trading partners, and pressure from competitors) positively and significantly influence mobile commerce adoption. The moderating influence of hedonic motivation was also achieved on the relationship between computer self-efficacy and result demonstrability. However, the proposed hedonic moderating relationship between computer anxiety and the adoption of mobile commerce is not significant.

Research limitations/implications: This study integrates three models to explain the adoption of m-commerce among Small and Medium Enterprises in Malaysia and tested the moderating influence of hedonic motivation. The results obtained better explain the decision by the SMEs to use mobile commerce.

Originality: The study critically considered how mobile commerce can be adopted by Small and Medium Enterprises in Malaysia which previous studies have largely ignored. Considering this, the study, therefore, advances a new relationship by integrating Technology Organization Enterprise Framework with Technology Acceptance Model 3, and the moderating influence of Hedonic Motivation to explain m-commerce adoption among Small and Medium Enterprises. This paper is one of the few research studies to test the moderating influence of hedonic motivation in this regard.

Keywords: Computer self-efficacy, Result Demonstrability, Computer Anxiety, m-commerce knowledge, pressure from Trading Partners, pressure from competitors, hedonic motivation.

1. Introduction

In recent years, information and communication technology (ICT) has grown tremendously as it is affording both individual and business users new ways of interaction while boosting economic

growth (Kurniawati, 2020; Rahi & Ghani, 2019). This milestone is achieved as ICT companies have made significant investments to ensure that connectivity for the users is improved by having multiple access to superior sorts of personalized and effective communications networks, and wider business coverage (Martín-Consuegra et al., 2015; Utami et al., 2019). Mobile Commerce (m-commerce) is one of the current waves of ICT that refers to “any transaction, involving the transfer of ownership or rights to use goods and services, which is initiated and/or completed by using mobile access to computer-mediated networks with the help of mobile devices” (Tiwari & Buse, 2007, p. 33). The benefits of m-commerce for organizations include improved productivity, increased customer satisfaction, reduction in operational costs, and competitive advantage (Chau & Deng, 2018). The global m-commerce transactions volume was anticipated to grow in multiple reaching US\$336 bn in 2020 from about US\$ 156 bn in 2017 (Retaildive, 2017).

Despite the benefits of m-commerce, studies have revealed that its pattern of adoption is low generally, in developing nations (Alrouسان & Jones, 2016; Ghazali et al., 2018; Khoi et al., 2018) and among Malaysian Small and Medium Enterprises (SMEs) users in particular (Chau & Deng, 2018; Utami et al., 2019). Malaysians are regarded to be far behind other users in some Asia-Pacific countries and developed nations. For instance, while the rate of adoption in China is 70.1%, Indian (62.9%), Taiwan (62.6%), Thailand (52%), Indonesia (54.9%), and Korea (53.8%), Malaysia is lagging with 40% rate of adoption and merely staying above Singapore (39%), and Vietnam (33%) (Go-Globe, 2016; Social, 2018). Given the reluctance of this sector to fully adopt m-commerce, it has been unable to contribute significantly to the GDP growth of the economy and hence, a source of concern for the policymakers (Okundaye et al., 2019).

Although the literature within the domain of e-commerce is ubiquitous (e.g., Awa et al., 2015; Khoi et al., 2018; Mohtaramzadeh et al., 2018), SMEs have not been availed with any guidelines on how to adopt m-commerce (Rana, et al., 2019) despite that, previous researchers have pointed to several challenges constraining the adoption of this novel technology among the SMEs. In particular, series of studies following Technology Acceptance Model 3 (TAM3) and Universal Theory of Acceptance and Use of Technology (UTAUT 2) point to computer efficacy, computer anxiety, result demonstrability, and hedonic motivation (HM) as influencing factors of technology adoption (Venkatesh & Bala, 2008; Venkatesh et al., 2012) and among SMEs in particular (Hababbeh, et al., 2018). Alternatively, other literature employing Technology Organization and Environment (TOE) framework argued for lack of Information Technology (IT) knowledge, trading partners, and competitors’ pressures either as inhibitors or as motivators to adopting m-commerce technology (Awa et al., 2015; Gangwa et al., 2015). Though these studies seem to elicit understanding about how SMEs adopt IT generally, a conclusion is yet to be reached among the scholars while many are very parochial in their conceptualizations (Awa et al., 2015). Additionally, the majority of these studies are not empirical, thereby, makes one question the generalizability and applicability of their results to the SMEs (Ghobakhloo & Tang, 2015). Moreover, most of the previous studies have laid much emphasis on the utility aspect of IT, but largely ignored the hedonic features that can serve as motivational factors (Khatimah et al., 2019; Pipitwanichakarn, & Wongtada, 2019) especially at the organization level. Furthermore, the importance of hedonic features was raised by Venkatesh et al., (2012), Lowry et al. (2012), and Tamilmani et al. (2019) but series of studies after then seem to concentrate largely on its benefits for individual customers at the detriment of the organizational users (e.g., Khatimah et al., 2019). We, therefore, believe

that most IT platforms, especially at the organizational level, will go into ‘extinction’ if their designers, marketers, and academics completely fail to incorporate and consider the hedonic factors aspect. This belief is built on the premise that the hedonic system is significantly capable of creating a level of deep immersion and concentration that is required for productivity (Lowry et al., 2012) especially among organizational users. Thus, this research seeks to answer the question of which factor influences m-commerce adoption among SMEs. Our objective is to bridge these theoretical gaps by integrating the constructs of TAM 3, UTAUT 2, and TOE frameworks, as they affect m-commerce adoption by SMEs.

This research contributes to literature and practice: First, we analyze m-commerce from the perspective of the firm rather than the individual users’ perspective which most previous studies considered. Second, the model of this study is based on rigorous theoretical underpinning as we integrate constructs from three different models. Third, our proposed conceptual framework considers relationship marketing ideas using both extrinsic and intrinsic factors influencing m-commerce adoption among SMEs. Fourth, and being the major contribution of this study, and in line with the recommendation of Tamilmani et al. (2019), we tested the moderating effect through the integration of TAM 3, UTAUT, and TOE constructs for SMEs m-commerce adoption which previous studies have majorly ignored.

The rest of the paper is as follows: Literature review and conceptual framework are presented after the introduction. Research methodology follows while results, discussion of findings, and implications for research and practice are presented after.

2. Literature Review and Conceptual Framework

A detailed insight into the information system (IS) adoption revealed that well-known models/theories have been used by previous scholars to explain and analyze m-commerce adoption and other IS-based products/services. A thorough synthesis and review of these models revealed that the original TAM (Davis, 1989) and UTAUT (Venkatesh et al., 2003) have been largely applied generally by extant scholars within the field of information system (IS) marketing and consumer behavior (e.g., Inegbedion et al., 2020) Nevertheless, the necessity to cover the weaknesses in these models led to their revisions. Consequently, Venkatesh and Bala, (2008) proposed TAM 3 while Venkatesh et al. (2012) proposed UTAUT 2 as researchers have shown that these models are robust at the prediction of technology adoption (Mitzner et al., 2016). However, a detailed review of the literature shows that existing IT adoption studies rarely combine these models to explain the adoption of m-commerce. Furthermore, extant scholarly arguments revealed that the core variables of UTAUT and TAM may not be potent to predict the acceptance of novel technology (Kim & Garrison, 2009). This, therefore, suggests that synthesizing other variables such as organizational context and environment context (based on TOE framework) (Tornatzky & Fleischer, 1990) that have been verified by other scholars (e.g., Ahmad et al., 2015; Awa et al., 2015; Eze et al., 2021; Maroufkhani et al., 2020) with selected constructs of TAM 3 and UTAUT 2 will be appropriate to predict m-commerce adoption, especially in the context of an emerging country, like Malaysia as equally justified by other recent studies (e.g., Alalwan, et al, 2016; Celik 2016; Chau et al., 2020; Chau & Deng, 2018; Shaw & Sergueeva; 2019; Siamagka et al.,2015). Therefore, this study integrates TAM 3 (Venkatesh & Bala, 2008), UTAUT 2 (Venkatesh et al., 2012), and TOE frameworks to explain the adoption of m-commerce among SMEs in Malaysia. Fig. 1 shows the conceptualization and approaches of the new framework based

on the existing gap in the literature. Our study proposed a new relationship of hedonic motivation on the relationship between computer self-efficacy, computer anxiety, result demonstrability, and m-commerce adoption among SMEs.

2.1 Computer Self-efficacy (CSE)

Bandura (1986) conceptualized self-efficacy through social cognitive theorization. Self-efficacy determines the pattern of behavior an individual exhibits, the amount of energy that is ready to be deployed, and the time to be devoted to overcoming a given challenge (Bandura, 1986). It refers to the degree of conviction a person holds about the ability to perform a given function (Ozturk, et al. 2016). In line with this, an individual who possesses a high degree of self-efficacy would likely regard a challenging task as what should be embraced and not avoided (Ozturk, et al., 2016). CSE, being a construct in TAM 3 is thus defined as “the degree to which an individual believes that he or she has the ability to perform a specific task/job using the computer” (Venkatesh & Bala, 2008, pp. 279). Recently, Islam et al (2020) affirmed that CSE is equally relevant within the realm of internet usage as an individual who believes that he/she has the capacity to use the system would like to explore the benefits of the internet further. Though extant studies have linked CSE with IT/IS adoption generally (e.g., Islam et al., 2020; Oztruk et al., 2016); the nature of the connection is not yet clear while such applications are very limited among SMEs to predict m-commerce adoption in the recent time. For instance, while some extant studies reported positive-significant relationships (Alalwan et al, 2016; Sharma et al., 2016), others found negative relationships (Oztruk et al., 2016). These contradictions and limited applications indicate an inconclusiveness that requires further research to resolve the existing conflicts and to give further insights on factors that can be used to predict the adoption of m-commerce among SMEs. Hence:

H1: CSE has a positive effect on m-commerce adoption among SMEs in Malaysia

2.2 Computer Anxiety (CA)

Anxiety is regarded as a major factor that determines the intention to adopt IT/IS (Yang & Forney, 2013). Consumer anxiety to use a computer-mediated platform is a state of mind about the readiness and ability to use the system (Yang & Forney, 2013). Being a construct in TAM3 it is defined as the degree of “an individual’s apprehension, or even fear, when she/he is faced with the possibility of using computers” (Venkatesh & Bala, 2008, p.279). Considering that m-commerce is a recent technology invention that is not confined by spatial and temporal boundaries, the associated anxiety that originates from using it may be aggravated than the anxiety that comes from transacting in the brick-and-mortar outlets (Celik, 2016). This is justifiable as CA is regarded as an individual perception inhibiting the formulation of a positive disposition about the easiness that is associated with m-commerce system usage (Venkatesh, 2000). Series of researchers have identified insecurity as one of the paramount factors that can cause anxiety in using IS based services (e.g., Celik, 2016; Leung & Dickinger, 2017) such as m-commerce. Leung and Dickinger (2017) recently argued that even though online transaction is now a commonplace amongst tourists; many still prioritize ‘webrooming’ mode by searching for a product online but subsequently visit a brick store to purchase due to associated online anxiety regarding payment, an intrusion of personal information and similar risks (Brown, et al. 2007). This has been supported by Lin et al (2013) who affirmed that Malaysian SMEs do not largely adopt e-commerce due to anxiety of insecurity and deficiency in cyberlaw. Notably, while some studies found a significant

and negative relationship between anxiety and m-commerce and other IT/IS based services (e.g., Gupta & Arora, 2017), a few others reported contradictory findings (e.g., Yang & Forney, 2013). Besides, the role of IT anxiety is still yet clear. While some researchers treat it as an exogenous construct (e.g., Celik, 2016), others conceptualized it as a moderating variable (e.g., Aziz et al., 2018; Hsu et al., 2019). Importantly, very limited studies have investigated CA within the context of mobile payment generally (Patil et al., 2020) and among SMEs in particular. These controversies and limited attempts require further investigation. Hence:

H2: CA has a negative effect on m-commerce adoption among SMEs in Malaysia

2.3 Result Demonstrability (RD)

RD is one of the constructs of TAM3 that is less tested by IS/IT adoption studies (Wu, et al., 2016). It is defined as the extent to which users of innovation believe that the benefits to be gained from using the innovation will be tangible, observable, and communicable (Siamagka et al., 2015; Venkatesh & Bala, 2008). Cakirli et al (2020) assert that when an individual perceives that a technology invention has some benefits that can be shown to others, they will be favourably disposed to use the system. Experience has however shown that some users have refused to adopt m-commerce or have reduced the rate of usage due to the inability of the platform to generate concrete and communicable results when compared to other innovations (Mandari et al., 2017; Yang & Lee, 2018). Notably, some of the previous studies have reported a positive and significant influence of RD in different IT studies such as smartwatch (Wu et al., 2016), cloud computing (Shiau & Chau, 2016), and social commerce (Chen & Wang, 2016). However, a few other researchers reported a non-significant relationship (e.g., Akturan & Tescan, 2010; Ebrahimi et al., 2018) while a review of literature by the researchers shows that previous studies have limitedly used RD to directly predict the adoption of m-commerce among SMEs. This inconsistency and availability of limited studies justify further research with a view to explain factors that can precisely predict the adoption of m-commerce. Hence:

H3: RD has a positive effect and m-commerce adoption among SMEs in Malaysia

2.4 Mobile Commerce Knowledge (MCK)

The knowledge of m-commerce is a significant factor that greatly determines its acceptance among SMEs operators and CEOs (Ghobakhloo et al., 2011). Events have shown that SMEs are confronting significant problems and risks concerning computerization as a result of inadequate knowledge of IS (Igbaria et al., 1997). It is therefore obvious that the degree of knowledge acquired by the Chief Executive Officers (CEOs) or other operators of the SMEs will decrease the level of uncertainty that is associated with IS/IT adoption (Chau et al., 2020; Ghobakhloo et al., 2011). Chau et al, (2020) argue that SMEs are not likely to adopt sophisticated IT such as m-commerce if their operators lack the knowledge to operate the system. However, Nasution et al (2021) argued that when an organization prioritizes knowledge acquisition and dissemination, the degree of adoption of the electronic system will be greater. This, therefore, points to the fact the knowledge and skills of the managers and founders are very essential as this will help to access and explore other internal/external resources of the firm that will equally facilitate the process of adoption

(Belso-Martínez et al., 2013). Notably, if the CEOs are well educated about the functions which m-commerce performs and the likely benefits that can be derived from it, many of the SMEs will be ready to adopt such technologies (Ghobakhloo et al., 2011). Obeidat et al., (2016), for instance, recently reported that knowledge management in the context of Jordan positively and significantly influences the adoption of technology innovation among Jordanian consulting firms. **This has further been reiterated by Ramadani et al., (2021) that the more the CEOs are knowledgeable about the benefits of digital innovation, the more the tendency that they will adopt information systems.** However, Ghobakhloo et al., (2011) and **Chau et al (2020)** found a non-significant relationship between IS knowledge and e-commerce adoption likewise Yoon et al., (2020) reported similar findings justifying its further investigation. Hence:

H4: M-commerce knowledge has a positive effect on m-commerce adoption among SMEs in Malaysia

2.5 Pressure from Trading Partners (PRT)

Trading partners are very important in the successful performance of SMEs. Because of their significance, they may mount pressure on SMEs to adopt m-commerce to conduct their businesses (Abed, 2020; Ahmad et al., 2015). Such pressures could be in the form of recommendations, promises, and threats, and thereby making the SMEs comply with such forces (Ahmad et al., 2015). For instance, past events have shown that big conglomerates have compelled and coerced their affiliates and other supplying partners to use IS technologies to connect with global production networks (Gibbs & Kraemer, 2004). **Ocloo et al (2020) recently argued that pressure from business partners could be a major factor that influences SMEs to adopt e-commerce.** This, therefore, shows the importance of pressure from the trading partners as many of the past studies have established a significant relationship between such pressures and the adoption of IT/IS (e.g., **Abed, 2020; Ocloo et al., 2020; Yeung, 2016**). And this points out that in the course of trying to meet up with the expectations of bigger partners and other customers by communicating and delivering services electronically, the SMEs are pressured to adopt IS such as internet-based commerce (Rahi et al., 2017). However, Ahmad et al. (2015) reported a non-significant relationship between pressure from trade partners and the adoption of IS. **Though previous studies have investigated PRT in the adoption of e-commerce and other IT platforms (e.g., Miao & Tran, 2018), little or no attention has been paid to how it can be used to predict m-commerce among SMEs.** The inconsistency in the findings of the previous studies and the limited attention among SMEs justify further investigation. Hence:

H5: Pressure from trading partners has a positive effect on m-commerce adoption among SMEs in Malaysia.

2.6 Pressure from Competitors (PC)

Competitive pressure refers to the degree of pressure felt by the firm from competitors within the

Industry (Gangwar et al., 2015). The need to survive in such a competitive environment has made many organizations like SMEs embrace information technology (Pearson & Grandon, 2006). This acceptance is based on the further justification that applications of IT/IS based tools such as m-commerce can assist this sector to widen their scope, change the rules of the game, stay ahead of competitors and increase customer base (Wu et al., 2016). Besides, SMEs may also feel threatened when they realize that other companies are increasingly adopting e-commerce and thereby pressured to adopt it as well, in order not to lose share of the market to the competitors (Ahmad et al. 2015). This position has been established by Gangwar et al. (2015) who suggested that one of the major pushing factors forcing organizations to adopt IS/IT is competitive pressure. Likewise, Chau et al (2021) argue that SMEs would come under pressure to adopt m-commerce to compete when their competitors have equally adopted similar technologies. Previous empirical studies report a positive and significant relationship between competitive pressure and adoption and diffusion of IT adoption (Alrawabdeh, 2014) such as m-commerce. However, Awa and Ojiabo (2016) and (Chau 2021) reported a negative and insignificant relationship justifying further investigation. Hence:

H6: Pressure from competitors has a positive effect on m-commerce adoption among SMEs in Malaysia

2.7 Hedonic Motivation (HM)

HM is regarded as the pleasure or fun obtained while using a specific technology (Venkatesh et al., 2012). It is conceptualized as fun perception (Pagani, 2004), perceived enjoyment (Ernst et al., 2013), and perceived playfulness among others that can influence the adoption of IS/IT-based services (e.g., Lowry et al., 2012) like m-commerce. According to Igbaria et al., (1995) it refers to the execution of a particular action for no obvious benefit other than just the process of performance. In IS/IT environment such as m-commerce, this may include the incorporation of animations, music, and entertainment that could make the users to be affectively attached to the system (Salimon et al., 2017; Weniger & Loebbecke, 2011). Such an attachment is essential to increase the rate of usage by improving the efficacy of users, reduce the level of anxiety, and significantly strengthens the result which individual users may obtain while using m-commerce (Liu, 2020). This is in line with the arguments of prior intrinsic motivation researches which suggest that an individual's intention to use technology could be increased via their desire to engage in intrinsically motivating activities for the sake of pleasure, fun, and task achievement (e.g., Pe-Than et al, 2015). In IT acceptance studies, most of the researches have been performed from an extrinsic motivation aspect while the intrinsic value such as HM has been ignored largely (Lowry et al., 2012). However, where HM has been considered, the majority of previous IS studies only conceptualized it either as an independent or a mediating variable (e.g., Ashraf et al., 2021; Chemingui & lallouna, 2013; Salimon et al., 2017), while its moderating effect has been majorly ignored (Tamilmani et al., 2019), especially through the integration of TAM 3, UTAUT and TOE constructs for SMEs m-commerce adoption. Ashraf et al (2021) equally argued that very limited studies have considered HM from the perspective of m-commerce adoption. Therefore, based on the limited knowledge of the researcher, this study is the pioneer study that conceptualized HM as a moderator on the relationship between CSE, CA, RD, and m-commerce adoption among SMEs.

We, therefore, proposed this relationship to reduce the observed inconsistencies in the results of previous studies and to fill a gap in the literature. Hence:

H7a: HM moderates either by strengthening or weakening the relationships between (a) CSE, (b) CA, (c) RD, and m-commerce adoption among SMEs in Malaysia

Considering the problem statement, literature review, and hypotheses statements, the following conceptual framework is proposed.

Insert Figure 1

3. Research methodology

3.1 Data collection

The central point of this study was SMEs in the State of Kedah in Malaysia. The rationale behind choosing firms from this State is that the State was agriculturally based and presently experiencing speedy growth in the area of industrial development that emanated from the diversity of its economy. The diversification policy of the State positions it as a fast-growing business area in Malaysia as many large manufacturing, service, and other companies, as well as SMEs have established their businesses in the State. More so, the presence of state-of-the-art information and telecommunication facilities that provide cutting-edge internet and communication connectivity makes this area a notch for this study. The sample frame of SMEs was acquired from the SME Corporation Malaysia, an agency established by the government of Malaysia more than two decades ago and charged with the responsibilities of coordinating and formulating policies and strategies for SMEs, as well as driving the development and growth of SMEs for the nation. This agency also serves as the central point of reference for research and data dissemination on SMEs and renders advisory services for SMEs in Malaysia (SME Corp Malaysia, 2019). From the enormous population of SMEs in Kedah State of Malaysia 48,894 representing 5.4% of total SMEs in Malaysia, 400 SMEs were sampled systematically, and the sample figure is consistent with the Krejcie and Morgan (1970) table for sample size determination. To confirm that this sample size is appropriate, and based on the recommendation of Cohen (1997) we further employed G*Power 3.1.9.7 software using parameters of power ($1-\beta$, 0.80); effect size (f^2 , 0.15); alpha significance level (α , 0.05); and 7 predictors. Considering these parameters, we arrived at a sample size of 103. However, this sample size may not be sufficient for a huge population of 48,894. We, therefore, revert to a more generalized scientific guideline suggested by Krejcie and Morgan (1970) as initially used.

However, to ensure that the sample selected for this study truly represents the population, the selection process was guided by the definition of SMEs according to SME Corporation Malaysia. SME Corp Malaysia categorized Malaysian SMEs into manufacturing, services, and other sectors (SME Corp, 2019). On the first hand, the small manufacturing segment has a minimum of RM 300, 000.00 (three hundred thousand Malaysian Ringgit) but less than RM 15 million (fifteen million Malaysian Ringgit) sales turnover and employs from 5 to 75 staff. For the service and other sectors of the manufacturing segment, the sales turnover should be a minimum of RM 300,000.00

(three hundred thousand Malaysian Ringgit) but not more than RM 3 million (three million Malaysian Ringgit) while having a minimum of 5 to a maximum of 30 employees. On the other hand, the medium enterprise of the manufacturing segment has a minimum of RM 15 million (fifteen million Malaysian Ringgit) but less than or the equivalent of RM 50 million (fifty million Malaysian Ringgit) sales turnover. The segment equally employs a minimum of 75 but less than or a maximum of 200 staff. The services and other segments of the medium enterprises have a minimum sales turnover of RM 3 million (three million Malaysian Ringgit) but less than or the equivalent of RM 20 million (twenty million Malaysian Ringgit) and employ a minimum of 30 but less than or a maximum of 75 employees. This definition is further shown in Figure 2.

Insert Figure 2

Based on the definition provided earlier and figure 2 above, we determined the sample size of this study by aligning with previous studies by selecting the participants from the manufacturing and services sectors (e.g, Ahmad et al., 2015). More importantly, all SMEs selected are duly registered with Suruhanjaya Syarikat Malaysia (SSM) or other equivalent bodies, while publicly-listed firms and subsidiaries of publicly-listed firms such as multinational corporations, government-linked firms, Syarikat Menteri Kewangan Diperbadankan, and state-owned enterprises were all excluded. This paves way for the opportunity to increase the validity of the outcomes related to some extant studies that tend to be industry-specific.

Survey questionnaire URL link was sent together with an invitation for participation through email to 400 SMEs email addresses, and 174 fully completed questionnaires were received which depicts a 43.5% response rate, therefore, aligning with the pattern reported by the previous studies (e.g., Lip-Sam & Hock-Eam, 2011). Based on TAM 3 upon which this study was equally grounded, the efficacy of using a computer-based online survey and which might have eased the completion of the web-based questionnaire may have resulted in the relatively high rate of response recorded. However, the online survey was configured such that submission cannot be possible in an event of unanswered questions, hence all of the 174 responses received were complete. Further examination and necessary scrutinization were carried out to ensure that none of the firms selected did violate the definition of SME as specified by SME Corp Malaysia in terms of the number of employees and sales turnover.

A t-test was conducted to assess if any differences existed between earlier respondents and late respondents and the result shows that there are no major differences in these respondents (Pallant, 2010). Analyzing the respondents' and firms' profiles as shown in Table 1, most of the firms surveyed are service sectors (73.4%), while others are from manufacturing sectors (26.6%). The features of the sample that was drawn duly represent the features of the population of the SMEs in Kedah state. In the manufacturing sector, 10.8% of firms surveyed have 51-150 employees, 9.3% have 5-50 employees, while 6.5% have 1-4 employees. About 29.7% of the firms surveyed in the service sector have 20-50 employees, 24.3% have 5-19 employees and 19.4% have 1-4 employees. The annual revenue earned by the majority of the SMEs in the manufacturing sector range from

RM200,000 to less than RM10 million, while in the services sector, the annual earnings were between RM1.5 million and less than RM5 million.

3.2 Measurement instrument

The researchers employed a cross-sectional research design to investigate the determinants of m-commerce adoption. The survey instrument for data collection was a questionnaire that consists of four sections. The first section asked a question about the demographic profile of respondents, the second section is about organization profile, the third is about the adoption of m-commerce, while the last section is about the determinants of the adoption of m-commerce. The measurement items for all the constructs were adapted from previous studies: M-commerce adoption items from Khoi et al. (2018) and Ghazali et al (2018), CSE, CA, and RD items were adapted from Celik (2016), Alalwan, et al, (2016) and Siamagka et al (2015). M-commerce knowledge, pressure from trading partners, and pressure from competitor's items were adapted from Ghobakhloo et al., (2011) and HM from Venkatesh et al (2012) and Salimon et a (2017). The content validity of the questionnaire was conducted and relevance with regards to the context was duly assessed. Before the commencement of the survey, a pilot test was conducted using 35 respondents from different categories of SMEs as participants. This coincides with the Cooper and Schindler (2003) recommendation of 25 to 100 respondents as pilot test group size and not necessarily be selected statistically. A five-point scale (1 = strongly disagree and 5 = strongly agree) was employed. Sequel to the pilot study, managers were found to be appropriate in responding to the questions regarding the adoption of m-commerce in their organizations.

Insert Table 1

3.2.1 Common Method Variance

Podsakoff et al. (2003) opined that a vital issue identified with self-report surveys is common method variance (CMV). While studies reveal that single source and self-report data is capable of inflating or decrease the relationships among the measured variable (Conway & Lance, 2010), the result may be subjected to unrealistically high correlations because of common method bias (Jakobsen & Jensen, 2015). Being that this study is consistent with the submission of these authors, Harman's single factor test was conducted and the outcome indicates no emergence of a single factor as well as the non-association of the first factor with the majority of the variance (< 50%), thus making the study to be free from CMV as suggested by Podsakoff et al. (2003).

3.3 Data Analysis Techniques

The descriptive statistics for this study was conducted with Statistical Package for the Social Sciences (SPSS) version 22, while measurement and structural model analyses were conducted with partial least squares (PLS) path modeling (Wold, 1985) using Smart PLS version 3.2.7 statistical software (Duarte & Raposo, 2010). The capability of partial least squares structural equation modeling (PLS-SEM) to simultaneously estimate both measurement and structural model is remarkable (Hair et al. 2017). This technique further permits concurrent modeling among multiple exogenous latent variables and endogenous latent variables (Hayes, 2013). More so, as a variance-based technique, PLS-SEM is appropriately useful for prediction, theory extension, or the modification of existing theory (Henseler, et al., 2009), and performance of complex analyses (Temme, et al., 2010). However, before conducting the final analysis, screening and cleaning of

data were duly conducted through a test of non-response bias, detection, and replacement of missing value, test, and treatment of outliers as recommended by Pallant (2010).

3.3.1 Assessment of Measurement Model

3.3.1.1 Reliability and validity

The assessment of the measurement model in the PLS analysis is conducted with the two major criteria known as reliability and validity (Tabachnick & Fidell, 2013). The results of the reliability and validity as revealed in Table 2 are consistently high across all the constructs. The Cronbach's Alpha scores range from .824 to .919, all the values are greater than the suggested .70 by Nunnally (1978). The values of composite reliability and rho_A which range from .895 to .935 and .825 to .920 respectively are indications of the strong reliability of the constructs given the argument that Cronbach's Alpha tends to undervalue the reliability scores (Hair et al., 2017). Therefore, the reliability of all the constructs exceeds the acceptable point and indicates that the constructs are reliable as recently confirmed by other studies (Adeleke et al., 2018; Bamgbade et al., 2019).

Insert Table 2

As indicated by average variance extracted (AVE) scores for the constructs, the values range from .591 to .815 which is above the recommended value of .50 and thus show that the constructs explain more than 50% of the variance of its indicators and in line with recent findings (Yusr, 2016; Salimon et al., 2017) In Table 3 and 4, the discriminant validity of the constructs is indicated following Fornell-Larcker criterion and Heterotrait-Monotrait Ratio (HTMT). Concerning these two methods, it was observed that each construct shares more variance with its associated indicators more than with any other construct (Hair et al., 2017). Furthermore, the values of HTMT for all the constructs fall within the threshold of .90 as suggested by Henseler et al. (2015). Hence, discriminant validity is achieved in line with empirical standards.

Insert Table 3

Insert Table 4

4.0 Assessment of Structural Model

4.1 Results

Having established the measurement model, the researchers are required to conduct an assessment of the structural model. The structural model assesses the relationships between all the latent constructs as hypothesized in this study. Table 5 shows the results of the structural relationships as obtained from the output of the data analysis. The findings revealed positive and significant relationships between all the independent variables and dependent variable. As shown in Table 5, computer self-efficacy (CSE) is positive and significantly related to m-commerce adoption (MCA) ($t = 2.659$, $p = 0.008$) thus supporting H1. Hypotheses H3, H4, H5, and H6 were all supported. This indicates that the relationships between result demonstrability (RD) and m-commerce

adoption ($t = 3.832$, $p = 0.000$), m-commerce knowledge (MCK) and m-commerce adoption (MCA) ($t = 2.947$, $p = 0.003$), pressure from trading partner (PTP) and m-commerce adoption (MCA) ($t = 2.415$, $p = 0.016$) and pressure from competitor (PC) and m-commerce adoption (MCA) ($t = 2.332$, $p = 0.020$) are positively significant. However, according to the findings, result demonstrability (RD) ($\beta = .256$) has the highest influence on SMEs mobile commerce adoption (MCA) in Malaysia, followed by m-commerce knowledge (MCK) ($\beta = .0221$), computer self-efficacy (CSE) ($\beta = .163$), PC ($\beta = .151$), computer anxiety (CA) ($\beta = .140$), while pressure from trading partner (PTP) ($\beta = .135$) has the lowest influence on SMEs mobile commerce adoption. Nevertheless, the relationship between computer anxiety (CA) and mobile commerce adoption (MCA) ($t = 1.780$, $p = 0.075$) is not supported thereby rejecting Hypothesis H2.

Insert Table 5

Insert Figure 3

The results of the moderating effects of HM are shown in Table 6. In the model, the moderating hypotheses are tested on the relationships between three independent variables, that is computer self-efficacy (CSE), computer anxiety (CA), and result demonstrability (RD), to the dependent variable, m-commerce adoption (MCA). Two of the hypothesized moderating effects H7a and H7c are supported while one H7b is not supported. In this regard, hedonic motivation (HM) positively moderates the relationships between computer self-efficacy (CSE) and mobile commerce adoption (MCA) ($t = 2.157$, $p = 0.031$), and result demonstrability (RD) and m-commerce (MCA) ($t = 3.070$, $p = 0.002$), thus indicating the positive interaction effects of hedonic motivation (HM) on these relationships. The moderating effect of hedonic motivation (HM) between computer anxiety (CA) and m-commerce adoption (MCA) ($t = 0.453$, $p = 0.651$) is not supported. The variance R^2 of SMEs mobile commerce adoption is shown in Table 7, the model explains 71.9% of the MCA variance. This signifies that all the variables (CSE, CA, RD, MCK, PTP, PC, and HM) jointly accounted for 71.9% of the variance in m-commerce adoption (MCA). Also, from Table 7, the predictive relevance Q^2 (MCA = 0.389) is in line with the recommended cross-redundancy value of greater than zero and indicates that the predictive quality of the model is substantive. The effect size of the constructs as shown in Table 8 depicts the impact of each of the independent latent construct on the dependent construct. Accordingly, the recommended values of effect size are 0.02, 0.15, and 0.35 representing small, medium, and substantial respectively (Cohen, 1988). As presented in Table 8, the effect size of each of the construct on the dependent construct is small and falls within the acceptable value by Cohen (1988).

Insert Table 6

Insert Table 7

Insert Table 8

Insert figure 4

Insert Figure 5

Figure 5 depicts the interaction influence of hedonic motivation (HM) and computer self-efficacy (CSE) on m-commerce adoption (MCA) among SMEs. As seen in this figure, Hypothesis H7a concerning the relationship between computer self-efficacy (CSE) and m-commerce adoption (MCA) is positively strengthened due to a high degree of hedonic motivation (HM), whereas with a low degree of hedonic motivation (HM), the computer self-efficacy (CSE) and m-commerce adoption (MCA) relationship is weakened. This essentially implies that with higher hedonic motivation (HM), a stronger and better positive relationship between hedonic motivation (HM) and m-commerce adoption (MCA) among Malaysian SMEs is achieved and vice versa.

Insert Figure 6

Additionally, figure 6 depicts the interaction influence of hedonic motivation (HM) and result demonstrability (RD) on m-commerce adoption (MCA). As seen from the figure concerning H7c, the relationship between result demonstrability (RD) and m-commerce adoption (MCA) is strengthened in the case of a high degree of hedonic motivation (HM), whereas with a low degree of hedonic motivation (HM), the relationship is slightly weakened. The interpretation indicates that the higher the HM, the stronger and better the positive relationship between result demonstrability (RD) and m-commerce adoption (MCA), and in the case of a low level of hedonic motivation (HM), the weakness in the relationship is almost not visible.

Insert Figure 7

Following Hair et al. (2014), the post-hoc importance-performance matrix analysis (IPMA) was carried out with m-commerce adoption (MCA) as a dependent variable. Figure 7 shows the performance level of the independent variables on individual terms (i.e., CSE, CA, RD, MCK, PTP, PC) together with their importance on m-commerce adoption (MCA). The graphical representation as presented herein will facilitate easy decision-making by the management of SMEs in Malaysia regarding the adoption of m-commerce. From the graph, the horizontal axis depicts the total effect in terms of path coefficients, while the vertical axis indicates the significance of the independent constructs with the mean scores showing their performance. Based on what is observable in Figure 7, the variable result demonstrability (RD) is highly important and relevant for influencing the adoption of m-commerce of SMEs in Malaysia due to its highest impact as shown in the graph. Other variables also displayed a high importance level with m-commerce adoption, their values are closer to result demonstrability (RD) thus indicating their relevance in influencing m-commerce adoption (MCA) by SMEs in Malaysia.

4.2 Discussion of Findings

The findings of this study show that the combination of technological, organizational, and environmental contexts enhances the adoption of m-commerce of SMEs in Malaysia. Specifically, CSE was found to significantly and positively influence the adoption of m-commerce among SMEs in Malaysia. This aligns with the previous findings of Sharma et al. (2016) which indicate that higher perceived mastery or capability of using a computer is very important among SMEs to adopt m-commerce. In essence, SMEs operators that have technological literacy, background, skills, and confidence tend to use m-commerce effectively than those without the specific attributes. Similar findings have been reported by Albashrawi et al (2020) Sigh and Srivastava (2020) who affirmed that when users have confidence about a new technology invention, they will use it more.

Additionally, CA has a positive and significant effect on m-commerce adoption among SMEs. This result contradicts many of the previous studies that found a negative relationship between anxiety and technology adoption (e.g., Nguyen and Cassidy, 2018; Patil et al., 2020). Anxiety is a concept that describes the extent of anxiousness which an individual faces while using technology such as m-commerce. However, with the result of this study, the level of anxiety tends to reduce drastically especially with the rising level of CSE among SMEs. This result is not surprising especially in Malaysia that is regarded to be the 'most developed of developing countries' where some SMEs operators seem to be familiar with the usage of technology. Yeow et al. (2008) reported similar findings that the degree of anxiety among users of technology could reduce as time goes on with the usage. Likewise, dos Santos and Santana (2020) reported that experience in using a computer reduces computer anxiety while Lin et al (2020) equally confirmed that strong anxiety has a positive effect on the adoption of a new product.

Similarly, RD has a positive and significant relationship with m-commerce adoption among SMEs. Previous technology adoption literature presents similar findings (e.g., Shiau & Chau, 2016) and which indicates that the more users can show the outputs generated from the usage of a specific technology, the more the tendency that they will adopt it. This result is especially important among SMEs operators who seem to be proud of communicating the tangibility of the results of using technology innovation to other SMEs colleagues. Such a demonstration has a psychological effect that energizes motivation among SMEs. Most startup entrepreneurs especially in developing countries who engage in SMEs are unlikely to use technology due to the perception of risk (Yang & Lee, 2019), but, if the benefits of such technology can be demonstrated by their colleagues, they are motivated to use it. Hubert et al (2019) likewise found a positive relationship between RD and adoption intention for smart home indicating the relevance of this variable. Additionally, Gow et al (2019) reported a direct positive effect of RD on intention while Yang and Lee (2019) indicated that RD indirectly predicted adoption intention. In essence, when m-commerce has noble features that can be communicated by the SMEs to their colleagues, they will adopt it for their operations.

Additionally, m-commerce knowledge also has a positive and significant influence on m-commerce adoption as reported by previous studies (Thong & Yap, 1995). In essence, this result seems to point to the fact that when SMEs have the skill and knowledge of m-commerce, the process of adoption could be facilitated and be sped up. However, the contrary could impede adoption as SMEs in developing countries are still grappling with the computerization of their businesses emanating from insufficient knowledge of IS. Given this result, it sounds logical to position that if SMEs operators are educated about the utilities and advantages of m-commerce for their transactions, they might be willing to use such technologies (Ghobakhloo et al., 2011).

Balocco et al (2009) had initially reiterated that one of the barriers to adoption of mobile internet among SMEs is lack of knowledge of the benefits of such system. Likewise, Natution et al (2021) reported that knowledge acquisition significantly influences e-commerce adoption among SMEs. This, thereby, indicates that knowledge is an essential ingredient that would assist the sector to determine the adoption of the system.

Our findings equally support that adoption of m-commerce is driven by pressure from trading partners as reported by the previous studies. This is substantiated on the premise that m-commerce requires the coordination and collaboration of business partners who are already using this technology. This is necessary as those active users seem to be independent and could lend their supports to other small business owners who are still grappling with the use of technology such as m-commerce. In Malaysia just like any other developing country, some SMEs require this kind of support so that they can function at full length. It, therefore, implies that the adoption of m-commerce requires the formulation of networks, coordination with other partners, and importantly, sharing of resources with the intent of satisfying the needs of diverse and ever-changing customers of the contemporary technology-driven time (Ghobakhloo et al., 2011). Chau (2021) also found that pressures from customers are essential to adopting m-commerce by the SMEs as such adoption would make the customers feel that their service providers meet their requirements for maintaining a good relationship and possessing the fitness to do business together.

Further pressure from competitors is also positively and significantly related to m-commerce adoption. Similar findings have been reported by previous studies (Gangwar et al., 2015; Gutierrez et al., 2015). This result is very important as it indicates that when other organizations implement IS such as e-commerce, cloud computing, and other similar technologies, SMEs are put under serious pressure to also adopt m-commerce to have a competitive edge. Given the high competition among business organizations, SMEs of today are majorly shifting from traditional operations to the usage of technology especially in developed countries. This trend is equally becoming noticeable across the developing countries and among SMEs in particular as indicated in the finding of this study. Li and Wang (2018) equally reported similar findings and argued that SMEs bow to pressure from their competitors and industry leaders who have similarly adopted m-commerce in their operations.

Moreover, HM moderates the relationship between CSE and the adoption of m-commerce among SMEs. This is in line with our proposition that the level of individual CSE could be heightened or sharpened by the inculcation of hedonic features such as music, animation, and other related techniques while using m-commerce. CSE has to do with an individual's dexterity in using a computer. This can be enhanced through intrinsic features that stimulate immersion with the use of technology like m-commerce. Even though many organizations today seem to adopt technologies with the primary objective of improving work efficiency, such efficiency can be enhanced by implementing/incorporating hedonic factors into m-commerce platforms (Song & Han, 2009). This, therefore, implies that the contingent nature of HM could stimulate a type of internet-fun experience that makes individuals to be engrossed in the system. Such attachment improves the efficacy required (this can be seen as the T.value increases after creating an interaction of HM with CSE and m-commerce adoption) to use m-commerce system. Though studies have not conceptualized this moderating relationship before, a number of researchers have however affirmed that hedonic motivation, self-efficacy, and adoption of technology are related (e.g., Myers et al., 2019; Salimon et al., 2017; Tarhini et al., 2019) and which aligns with our result

that HM as a contingent construct is instrumental at boosting the relationship between self-efficacy and m-commerce adoption.

Additionally, HM moderates the relationship between RD and the adoption of m-commerce among SMEs. This result is in line with our projection that the injection of HM as a contingent variable between RD and m-commerce adoption could improve the relationship. Based on the finding of this research, this contingent relationship has been established: the more profoundly users are in a hedonic state while using m-commerce, the more likely they will regard the site useful and through which they can demonstrate the outputs generated from the system. The introduction of hedonic factors, in essence, puts a smile on the face of m-commerce users, thereby, makes them relate their experiences to others. This, therefore, proves that there is an interconnection between utilitarian and intrinsic features of an IT system and has been argued by Roberts et al (2006) that individual motivations (extrinsic and intrinsic) are rather interrelated and not independent. In essence, even though an individual might be using the system to achieve the extrinsic outputs, the output will be more demonstrated if the system in use avails the users with some degree of fun. This is in line with the finding of Martín-Consuegra et al. (2019) who assert that the higher degrees of enjoyment while using an IS could lead to a higher degree of satisfaction.

Nevertheless, HM does not moderate the relationship between computer anxiety and m-commerce adoption. This is not surprising as we have initially obtained a positive relationship between computer anxiety and m-commerce adoption thereby indicating that users regarded HM as an instrument of fun which makes them use m-commerce for usage only and does not have any relationship (either strengthening or weakening) with their anxiety level. This finding is in line with the conceptualization of HM as “the fun or pleasure derived from using a technology” (Venkatesh et al., 2012, p. 161) without any specific extra benefit other than the usage (Salimon et al., 2017).

5. Implications for Research and Practice

This study has two major implications: academics, and industry practice. The academic implication is based on the integration of three models (TAM, 3, UTAUT 2, and TOE) which previous studies have hardly combined to explain the adoption of IS/IT. This is a rare marketing study as its framework can be used to predict the adoption of m-commerce in the context of Malaysia and other developing countries. In particular, the use of hedonic motivation which has attracted the attention of western writers, but has been ignored by the majority of scholars from developing nations is a major theoretical contribution. The hedonic motivation is used as a moderator between the selected independent variables and m-commerce adoption among SMEs and will be a significant theoretical contribution to the body of literature.

In practice, identifying predictive factors of m-commerce adoption can assist the SMEs in Malaysia to improve performance since the adoption will help these organizations to expand their scope, improve customer base while augmenting revenue per every customer. For instance, the positive relationship between computer self-efficacy and m-commerce adoption suggests that m-commerce practitioners should incorporate those features that can improve the skills and knowledge of operations of m-commerce among SMEs owners. Besides, the providers could also provide free training to enhance such skills and mastery. Similarly, the results equally have some implications concerning computer anxiety. In this study, a positive significant relationship was found between computer anxiety and the adoption of m-commerce against the findings of most

previous studies. The implication of this for the practitioners is to sustain this by integrating HM features that will ensure that the users are affectively attached to m-commerce platforms. Such features will equally enhance the mastery and generate repeated usage of the system. Additionally, the result indicates that RD is highly important and relevant for influencing the adoption of m-commerce among SMEs in Malaysia due to its highest impact as shown in the importance-performance graph. This, therefore, indicates that the m-commerce providers should incorporate features that will assist the users to achieve this. In today's technology-driven environment, an average user of technology wants to show the benefits he is enjoying from using a given technology, and configuring the m-commerce platform that makes this achievable will improve the rate of adoption.

The results of the study equally provide some insights to the policymakers to come up with policies that will assist SMEs to adopt technology generally and m-commerce in particular. Such policies, for instance, could be in the area of providing training to the CEOs or other principal managers of the SMEs to be familiar with m-commerce usage. When the training is provided, SMEs will regard technology as an instrument that could be used to improve their operations and thereby, subsequently contribute to the development of the economy.

6. Conclusion and future research recommendations

The benefits of m-commerce have been acknowledged globally. Nevertheless, its rate of adoption among SMEs in developing countries is very low generally while very limited studies are available to provide a guideline to the SMEs on how to deploy the IS platform effectively. This study, therefore, proposes a conceptual model based on TAM 3, UTAUT, and TOE to predict the adoption of m-commerce among SMEs. The findings from this conceptualization show that CSE, CANX, RD, pressure from competitors, pressure from trading partners, and mobile commerce knowledge have major influences on the m-commerce adoption of SMEs. Similarly, the moderating role of HM was reported on the relationship between CSE, RD, and m-commerce adoption. Nevertheless, the moderating role of hedonic motivation on the relationship between computer anxiety and m-commerce was not significant. The findings of this provide significant insights for practitioners, marketers, and the academic community.

Despite the outputs of this research, however, some limitations are observable. The first limitation concerns the selection of seven significant factors used to predict the adoption of m-commerce among SMEs. This comes as a limitation as the study fails to discuss other predictive factors such as perceived benefits, perceived compatibility, owner initiative, and cost among others which have been empirically investigated by previous studies. For instance, Rahayu and Day, (2015) reported that perceived fits and owner initiatives are important factors that determine the adoption of technology among SMEs in Indonesia. Similarly, Lawson et al (2003) also stated that concern about intrusion of privacy and security, cost of IT consultants, and lack of IT expertise among employees are the inhibiting factors. Other moderators such as trust and culture have been omitted from this study. In line with the arguments of Zhang, et al. (2012) trust in mobile commerce may reduce the perception of risk, anxiety, and fear that may be associated with the use of mobile commerce. Hence, using trust as a moderator will be an important contribution by future researchers considering the high level of insecurity that is being faced in the online environment.

The second limitation of the study is the selection of SMEs in the Kedah State of Malaysia. Though we employed systematic sampling which to an extent makes the results of the study to be generalizable, future researchers should expand the coverage of the study to other States in Malaysia. The extension will make the results of such studies to be more robust.

Third, this study is quantitative and which makes the result generalizable. We however recommend future studies to conduct mixed-mode research which allows the researchers to triangulate findings coming from the qualitative and quantitative approach. Such an approach will make the findings to be comprehensive as researchers would be able to interpret the findings of the quantitative study from a qualitative perspective.

The last limitation is the cross-sectional nature of this study as we collected the data of the research at one point in time. This is a limitation because we might not be able to track changes that can occur with the adopters in their m-commerce adoption process. Considering this, we recommend future researchers to conduct a longitudinal study to compare the changes in the m-commerce adoption process and investigate the differences in the effects of the selected exogenous variables and moderating variables on m-commerce adoption at different time points.

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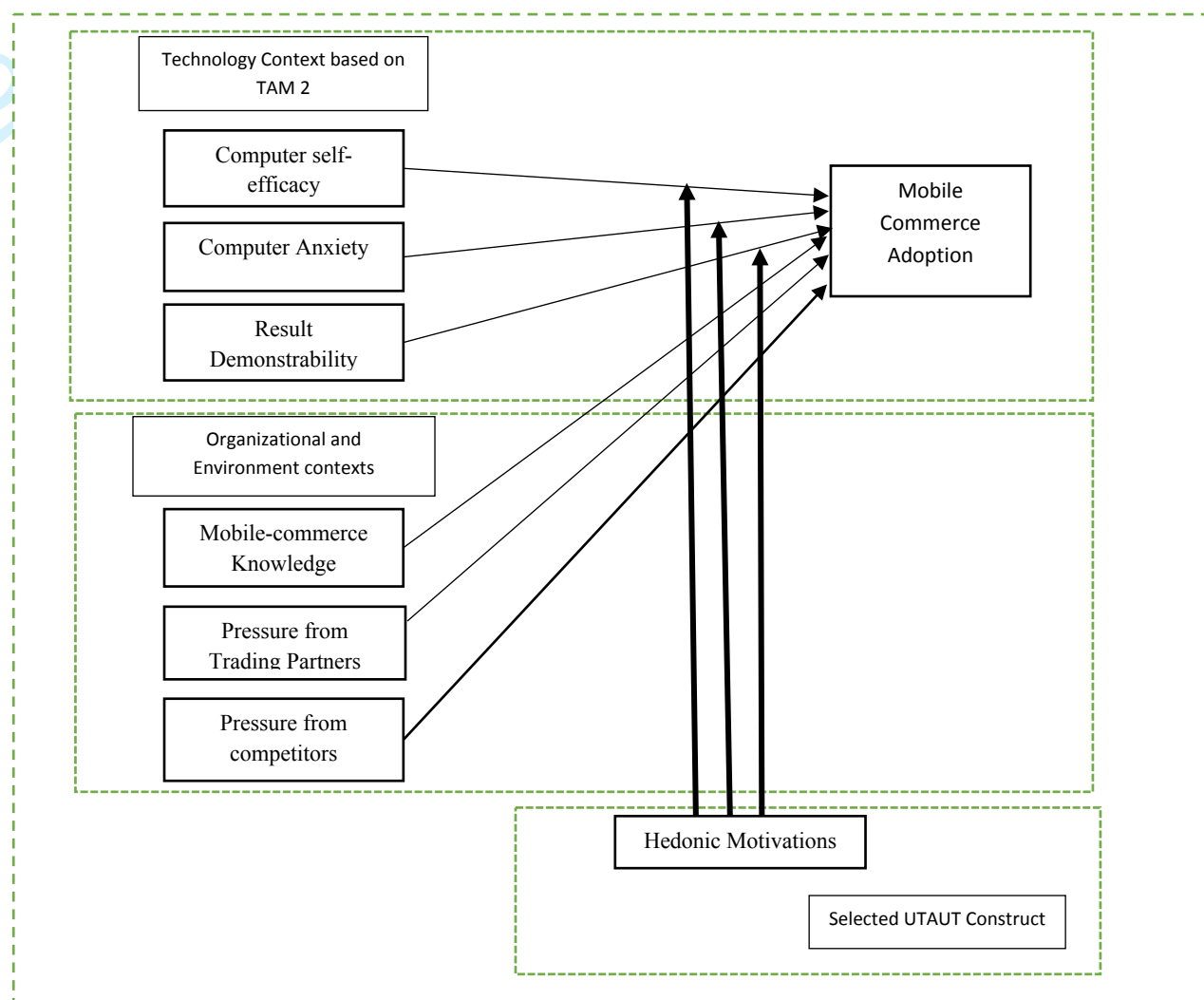


Figure 1: Proposed Conceptual Framework showing combination of TAM 2, TOE and UTAUT constructs

Key:  New relationships  existing relationships

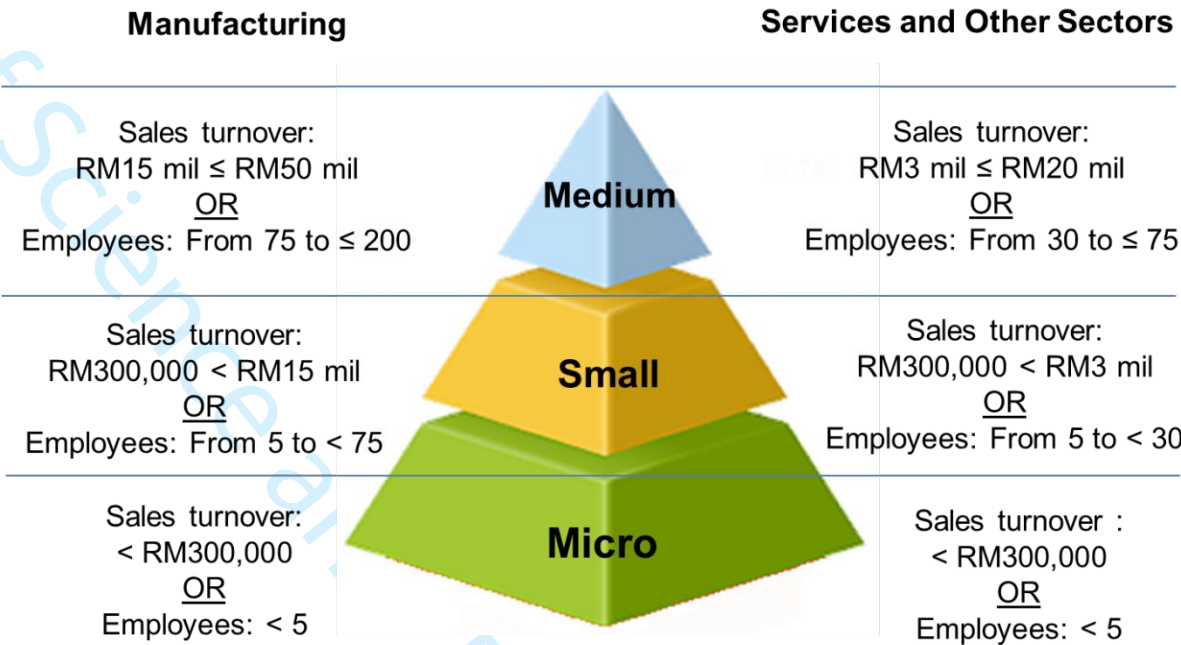


Figure 2. Definition of SMEs in Malaysia
Source: SME Corp Malaysia. (<http://www.smecorp.gov.my/index.php/en/policies/2015-12-21-09-09-49/sme-definition>).

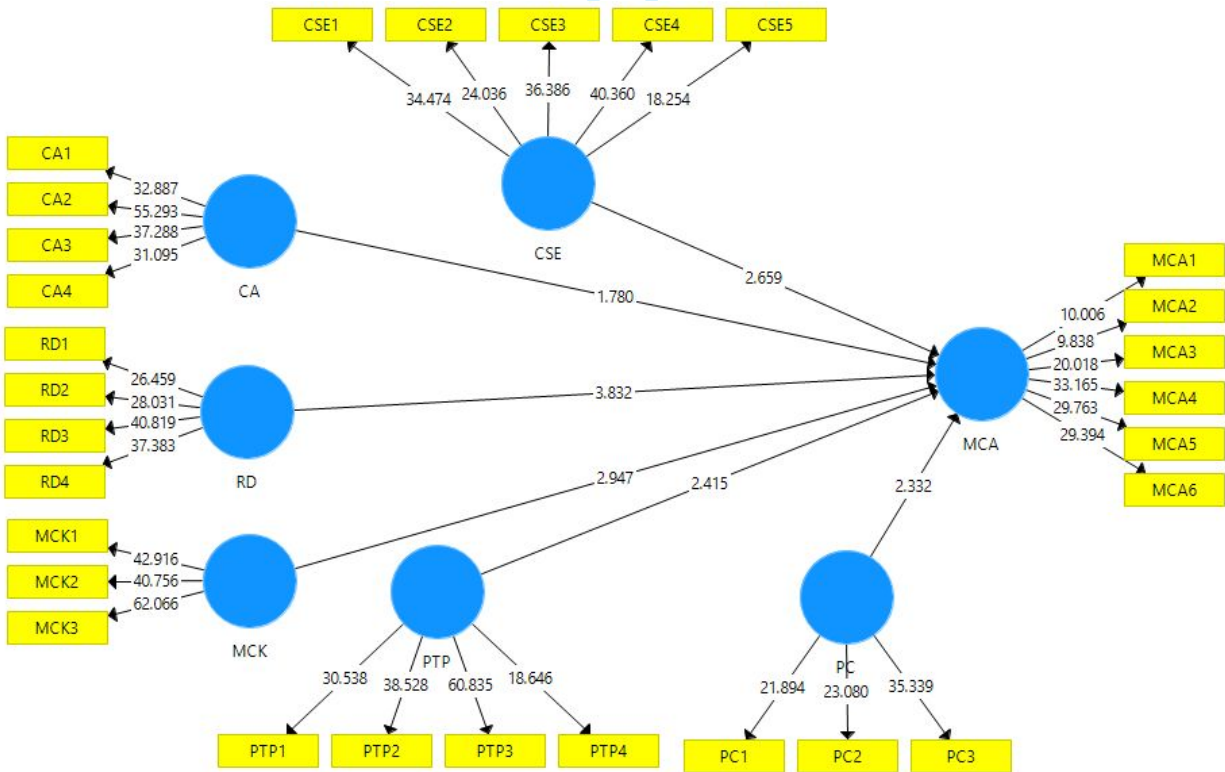


Figure 3: Structural Model of Direct Effect

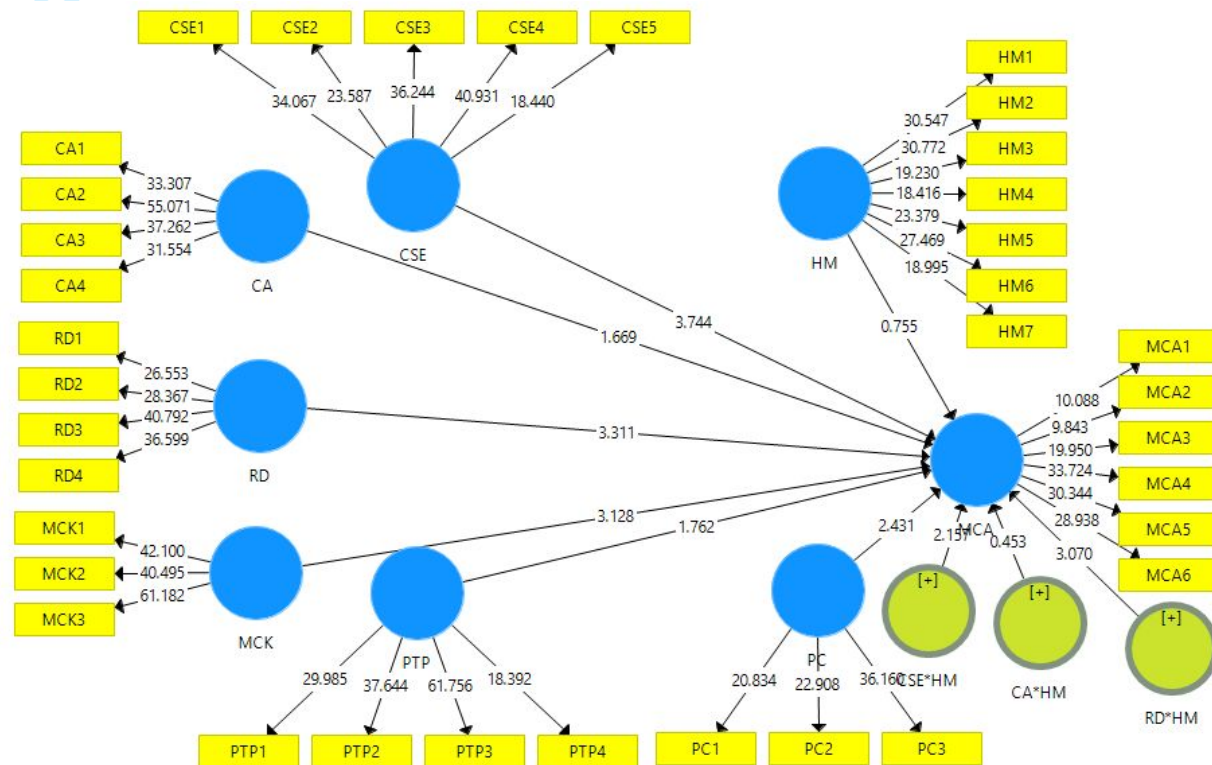


Figure 4: Structural Model of Moderating Effect

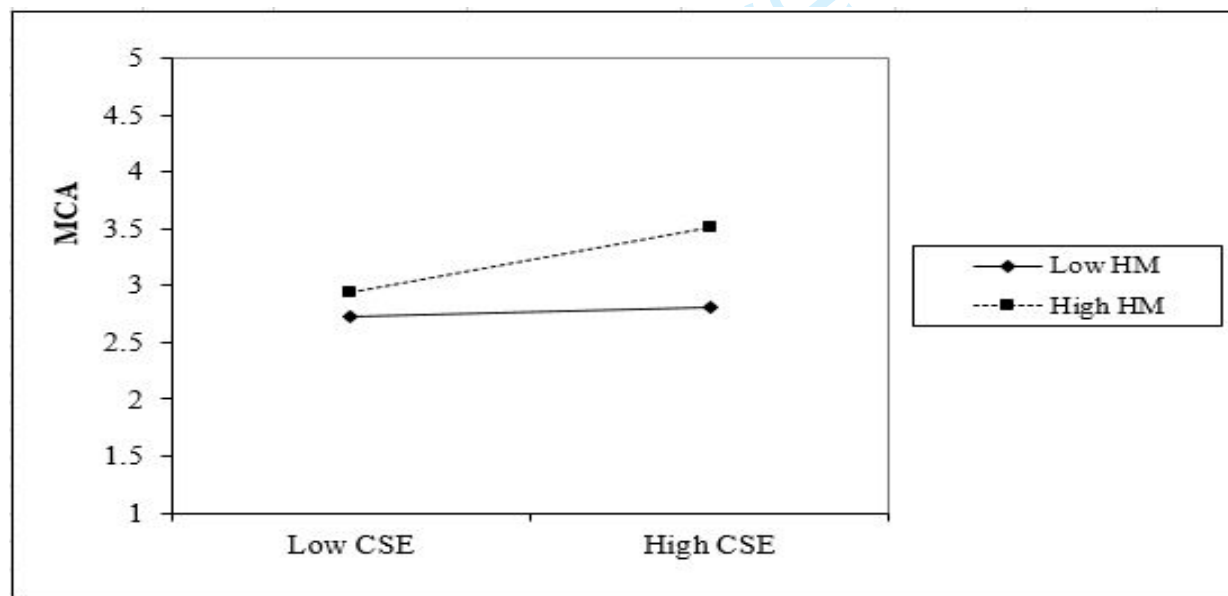


Figure 5: Interaction effect of HM and CSE on MCA

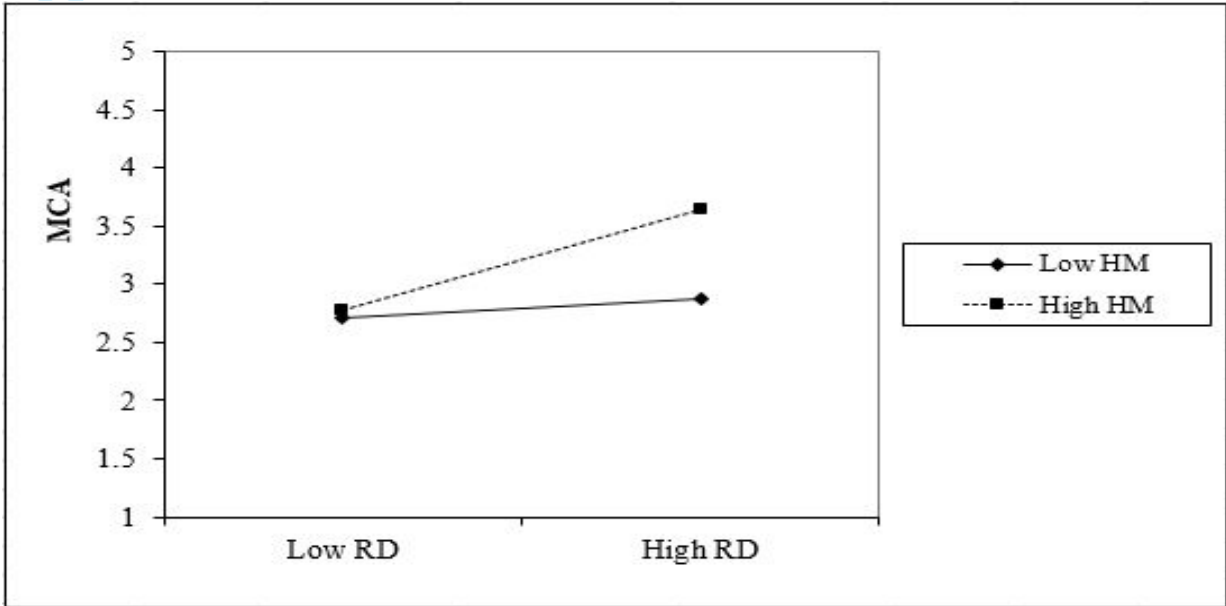


Figure 6: Interaction effect of HM and RD on MCA

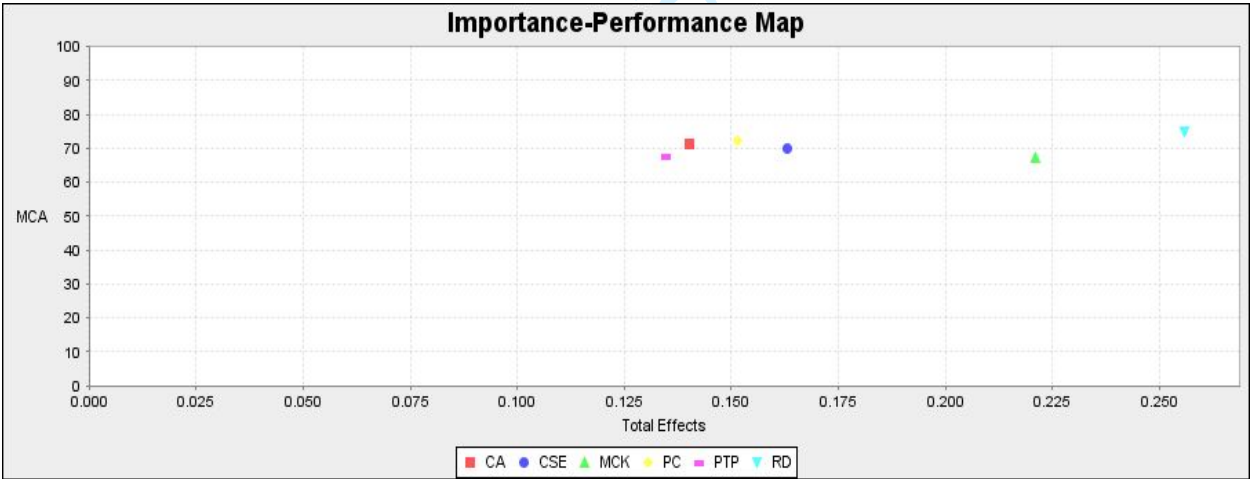


Figure 7: Importance-Performance Matrix

Table 1
Demographics

Characteristics	Frequency	Percentage
<i>Gender</i>		
Male	59	33.9
Female	115	66.1
<i>Age of respondent's</i>		
21–30 years old	38	21.8
31–40 years old	79	45.4
41–50 years old	36	20.7
>50 years old	21	12.1
<i>Educational level</i>		
Secondary or lower	11	6.3
Diploma/certificate	39	22.4
Bachelor degree/professional	98	56.4
Postgraduate degree	26	14.9
<i>Type of industry</i>		
Manufacturing	46	26.6
Services	128	73.4
<i>Total number of employees</i>		
Manufacturing		
1–4 employees	11	6.5
5–50 employees	16	9.3
51–150 employees	19	10.8
Services		
1–4 employees	34	19.4
5–19 employees	42	24.3
20–50 employees	52	29.7
<i>Yearly revenue</i>		
Manufacturing		
>RM250,000	12	26.1
RM250,000–less than RM10 million	28	60.9
RM10 million–less than RM25 million	6	13
Services		
>RM200,000	17	13.3
RM200,000–less than RM 1 million	43	33.6
RM1 million–less than RM5 million	68	53.1

Table 2
Construct validity and Reliability

Construct	SD	Mean	Cronb.	Rho_A	CR	AVE
Computer Anxiety			0.886	0.891	0.921	0.74
CA 1: I am apprehensive of using the m-commerce system to make a purchase	3.57	.952				
CA2: I am scared that could lose my information using the system for shopping	3.76	.880				
CA3: I am hesitant to use the mobile commerce system due to fear of committing errors that I cannot rectify	3.67	.927				
CA 4: The system is rather scary to me	3.75	.843				
Computer Self-Efficacy (CSE)			0.895	0.897	0.923	0.706
CSE 1: I could transact using m-commerce without anyone telling me what I should do	3.21	1.156				
CSE 2: I could transact using mobile commerce system if there is a helping hand where I get stuck	3.47	1.084				
CSE 3: If had enough time I could finish the job I started using a mobile commerce system.	3.48	.978				
CSE 4: I could finish a transaction using mobile commerce if built-in assistance facility is available.	3.60	.905				
CSE 5: I could complete a transaction using mobile commerce even if I have not used a similar system like that before	3.71	.892				
Hedonic Motivation (HM)			0.919	0.920	0.935	0.674
HM 1: My curiosity is frequently inspired by the mobile commerce system	3.83	.812				
HM 2: I drive a lot of joy while using m-commerce systems	3.76	.797				
HM3: The mobile commerce system features are enjoyable	3.82	.824				
H4: My feelings are constantly stimulated while using m-commerce system	3.84	.849				
H5: I always feel excited about the features of m-commerce	3.59	.932				
H6: I feel pleased with the adoption of m-commerce	3.65	.852				
H7: Overall, I enjoy using m-commerce	3.69	.891				

Mobile Commerce Adoption (MCA)			0.859	0.868	0.895	0.591
MCA 1: I intend to use m-commerce for our operations	3.82	.858				
MCA 2: I expect that I will use m-commerce	3.74	.851				
MCA 3: I plan to use m-commerce for our activities	3.88	.799				
MCA 4: I will be using m-commerce system	3.93	.734				
MCA 5: I anticipate that I would use m-commerce in the next few months	3.79	.693				
MCA 6 I am prepared to use mobile commerce system to conduct some transactions	3.87	.816				
Mobile Commerce Knowledge (MCK)			0.887	0.890	0.930	0.815
MCK 1: I would rate my comprehension of information system as very good compared to others in similar functions	3.71	.898				
MCK 2: Concerning my knowledge of IS, I know the consequences of adopting a new m-commerce system on my enterprise	.401	.815				
MCK 3: I am conversant with the majority of information system platforms like m-commerce	3.97	.775				
Pressure from Competitors (PC)			0.824	0.825	0.895	0.741
PC 1: Our company is aware of m-commerce system implementation in our competitor organizations	3.80	.797				
PC 2: We understand the competitive advantages offered by m-commerce system	3.73	.907				
PC 3: We feel pressured to use m-commerce sequent to the adoption of m-commerce systems by competitor organization	3.78	.861				
Pressure from Trading Partners (PTP)			0.875	0.877	0.915	0.731
PTP 1: Our industry pressure us to adopt m-commerce	3.82	.803				
PTP 2: Our buyers and customers are pressuring us to adopt m-commerce	3.84	.788				
PTP 3: Our supplying partners give us pressure to adopt m-commerce	3.84	.849				
PTP 4: Our remote suppliers' demands for improved communications system	3.83	.874				

are pressurizing us to adopt m-commerce					
Result Demonstrability (RD)			0.884	0.888	0.920 0.742
RD 1: I would not have difficulty communicating with others concerning the benefits of using mobile commerce	3.78	.873			
RD 2: I would not have difficulty elucidating why using m-commerce may be beneficial.	3.61	.898			
RD 3: The outcomes of using mobile commerce are apparent to me.	3.70	.806			
RD 4: I would have no trouble explicating why mobile commerce is beneficial to others	3.67	.855			

Table 3: Discriminant Validity (Fornell-Larcker Criterion)

	CA	CSE	HM	MCA	MCK	PC	PTP	RD
CA	0.864							
CSE	0.592	0.840						
HM	0.536	0.519	0.821					
MCA	0.726	0.644	0.527	0.769				
MCK	0.796	0.566	0.511	0.721	0.903			
PC	0.497	0.433	0.673	0.557	0.461	0.861		
PTP	0.628	0.446	0.521	0.654	0.596	0.490	0.855	
RD	0.600	0.577	0.418	0.699	0.572	0.383	0.597	0.862

Table 4: Heterotrait-Monotrait Ratio (HTMT)

	CA	CSE	HM	MCA	MCK	PC	PTP	RD
CA								
CSE	0.664							
HM	0.593	0.574						
MCA	0.824	0.729	0.605					
MCK	0.898	0.636	0.565	0.820				
PC	0.577	0.506	0.767	0.679	0.534			
PTP	0.710	0.501	0.580	0.755	0.676	0.570		
RD	0.677	0.643	0.459	0.787	0.638	0.446	0.669	

Table 5: Assessment of Direct Effect

H+	Relationships	Beta Values	Standard Error	T Values	P Values	Remarks
H1	CSE -> MCA	0.163	0.061	2.659	0.008***	Supported
H2	CA -> MCA	0.140	0.079	1.780	0.075*	Not Supported
H3	RD -> MCA	0.256	0.067	3.832	0.000***	Supported
H4	MCK -> MCA	0.221	0.075	2.947	0.003***	Supported
H5	PTP -> MCA	0.135	0.056	2.415	0.016**	Supported
H6	PC -> MCA	0.151	0.065	2.332	0.020**	Supported

Note: ***Significant at 0.01, **Significant at 0.05, *Significant at 0.1

Table 6: Moderating Effect

H+	Moderating Relationships	Beta Values	Standard Error	T Values	P Values	Remarks
H7a	CSE*HM -> MCA	0.124	0.057	2.157	0.031**	Supported
H7b	CA*HM -> MCA	0.028	0.061	0.453	0.651	Not supported
H7c	RD*HM -> MCA	0.174	0.057	3.070	0.002***	Supported

Note: ***Significant at 0.01, **Significant at 0.05,

Table 7: Coefficient of Determination (R^2) and Predictive Relevance (Q^2)

	R Square	SSO	SSE	$Q^2 (=1-SSE/SSO)$
MCA	0.719	1,044.000	637.518	0.389

Table 8: Effect Size (f^2)

	MCA
CA	0.022
CSE	0.056
MCK	0.060
PC	0.056
PTP	0.035
RD	0.114