

# Factors Influencing the Technology Acceptance of Mobile Commerce in Malaysia by using the Revised UTAUT Model

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**Abstract:** The purpose of this study is to study positive and negative factors that can substantially explain mobile commerce (m-commerce) acceptance in Malaysia. A technology acceptance model for m-commerce with eight factors is constructed. Data collected from 400 respondents are being tested on the proposed model. Confirmatory factor analysis is performed to test the reliability and validity of the model and structural equation modelling is performed to access the relationship between behavior intention and each factor. The acceptance of m-commerce is influenced by factors including performance expectancy, effort expectancy, social influence, facilitating conditions, Mobility, Personal Innovation, Perceived Trust and use behavior; while Perceived risk is insignificant in this case. The results of this study are useful for m-commerce providers in adapting their m-commerce promotion strategy. This study contributes to the practice by providing a model for m-commerce user technology acceptance, which can be used as the basis for future investigations.

**Keywords :** Electronic commerce, Mobile commerce, UTAUT, user acceptance.

## I. INTRODUCTION

The popularity of smart phones and tablets has increased fast since I-Phones were introduced in 2007, and mobile commerce (m-commerce) keep booming[1]. This changes the way consumer purchase, that can buy and interact everywhere, every time and everywhere [2]. In comparison to traditional electronic trade (e-commerce), the main benefit of m-commerce is that people can be involved in ubiquitous communication without the limitations of wired alternatives through the use of mobile terminals and networks[3]. In Malaysia, Internet users have been a great number and great growth, particularly the Malaysian Multimedia and Communications Commission, which has reported that, compared with 2012, the number of wireless internet users including mobile networks has increased to 24,5 million by 2017, almost 40% (MCMC 2107). According to the survey of

MCMC 2017, showed in Figure.1, it shows that the proportion of using online purchase by mobile phone has reached to 48.8% in Malaysia. According to the survey demonstrates that over half (56.7%) of online consumers tied up in the activity only few times a year, followed by a quarter on monthly basis (24.7%). Only 4.8% online shop on weekly or daily basis, whereas 13.8% did shop online once a year.



**Fig.1 Percentage of Internet users by online shopping activity and percentage of online shopping frequencies (MCMC2017)**

This study will discuss the factors, which influence the intention to promote the acceptance of M-commerce among mobile users when it comes to online shopping through reliable and reachable applications anytime anywhere for its users. M-commerce was initially anticipated to experience a tangible increase for more than one reason, excluding the accelerated proliferation of mobile device acceptance and the clear benefits of anytime-any place connectivity. However, most M-commerce programs, excluding a few numbers of private programs such as ringtones downloads, have unsuccessful match expectations [4]. Thus, it is vital that shed light on the behavioral, social and technical features influencing the adoption of m-commerce by online consumers. A report from Allied Business Intelligence (ABI research) the M-commerce market is anticipated to account for 24.4% of overall Electronic-commerce revenues by the end of 2017[5]. This characterizes the result of some spectacular growth in 2011, when the mobile online commerce market doubled in size to \$65.6 billion. ABI Research's mobile online commerce report found that this growth is being fuelled by the rapid adoption of smartphones

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in both mature and developing markets, as well as a retail market in which traditional brick-and-mortar retailers are implementing multi-channel strategies in the face of increasing competition from Internet-based vendors[6]. Presently, M-commerce is a relatively small percentage of the overall Electronic-commerce market, but growing at a much faster rate[7]. M-commerce reached a tipping point in 2018, fuelled by the move from standalone apps and storefronts to the current situation where M-commerce platforms, apps, and services are now being enhanced, optimized and integrated[8].

## II. THEORETICAL BACKGROUND

The analysis on the user intention to accept the technology has been conducted via various technology acceptance theories and models such as the technology acceptance model (TAM) [9], the innovation diffusion theory (DOI) [10], the theory of planned behavior[11], the theory of reasoned action [12], and the unified theory of adoption and use of technologies (UTAUT) [13]. We have also explored and defined from these studies, we define the structural model used for this research made of eight constructs: performance expectancy, effort expectancy, social influence, facilitating condition, mobility, perceived trust, perceived risk, personal innovation and behavioral intention. Their aim was to explain the consumer's intention to accept m-commerce.

## III. RESEARCH OBJECTIVES

To identify the factors affecting on consumers behavioral intention towards m-commerce application acceptance and to investigate the relationship of Effort Expectancy, Effort Performance, Social Influence, Facilitating Condition, Mobility, Personal Innovation, Perceived Risk and Perceived Trust as factors of behavioral intention use.

## IV. RESULTS

To achieve the objective of the present study, forty five itemed questionnaire for all the three variables (effort expectancy, performance expectancy, social influence, facilitating condition, mobility, perceived risk, perceived trust, behavioral intention and use behavior) were administrated, for each item five point Likert scale were used. The obtained data of each variable was statistically analyzed through descriptive statistics and the findings are shown as in table given below:

Statement	Mean	SD
Using my mobile for online purchasing (e.g. buying clothes, hotel and airline reservations) is convenient.	3.87	1.01
Using my mobile for online purchasing (e.g. buying clothes, hotel and airline reservations) is clear and understandable.	3.81	0.96
Learning to operate mobile online purchasing (e.g. buying clothes, hotel and airline reservations) will be easy for me.	3.86	0.99
I can easily become skilful at using mobile online purchasing service (e.g. buying	3.86	0.98

clothes, hotel and airline reservations).		
Overall, I find m-commerce service is easy to use.	3.9	0.98
<b>Total</b>	<b>3.68</b>	<b>0.81</b>

To address the measurement of effort expectancy that 5 questions were selected 5-point Likert scale ranging from strongly disagrees to strongly agree. Based on Table (1) the overall mean of all indicators was 3.86, which showed that the level of effort expectancy was higher than median of scale (3). According to descriptive statistic of related items to Effort Expectancy (1) the highest mean belongs to "Using my mobile for online purchasing (e.g. buying clothes, hotel and airline reservations) is convenient" with (M=3.87, S.D=1.01) followed by "Using my mobile for online purchasing (e.g. buying clothes, hotel and airline reservations) is clear and understandable." with (M=3.81, S.D=0.96). Last and least mean was related to "Using my mobile for online purchasing (e.g. buying clothes, hotel and airline reservations) is clear and understandable." (M=3.81, S.D=0.96).

Statement	Mean	SD
Mobile devices are useful tools for conducting online purchasing (e.g. buying clothes, hotel and airline reservations).	3.92	1.02
I can do online purchasing faster in mobile devices than using desktop computers purchasing (e.g. buying clothes, hotel and airline reservations).	3.71	1.07
Using mobile for online purchasing (e.g. buying clothes, hotel and airline reservations) make me save time.	3.87	1.01
Using my mobile for online purchasing (e.g. buying clothes, hotel and airline reservations) increases my efficiency.	3.89	0.98
Overall, I find mobile service useful in my daily task	4.00	0.94
<b>Total</b>	<b>3.88</b>	<b>0.81</b>

## V. RESEARCH METHODOLOGY

The population of this study is every individual living in Kuala Lumpur who uses a smart phone with a Wi-Fi 3G or 4G connection. Data collection was carried in two phases. First, a developed survey questionnaire was used to make a pre-test with 13 academic experts and professionals (in IT, management of information system, business administrations, and bank managers). Second, once this pre-test verified the strength of the research model, the questionnaire was generally administered via physically at UTM Campus, Banks and Commercial companies. We distributed 400 and received 370 of them filled-in, 30 of which were unusable (not completely answered, etc.). Overall, we obtained a total of 370 usable surveys for this study, giving a return rate of 90.25%.

A total of 49 items were used to measure the 8 independent variables, and 1 items were used to measure the dependent variable. Besides the demographic profiles



(age, gender, marital status, education level, and income), we used a 5-point Likert scale ranging from 1 (strong disagree) to 5 (strongly agree) to measure all items. We used smartpls-3.0 software for the processing and analysis of the data collected. This allowed us to assess the adequacy of the theoretical model and verify its hypotheses.

**VI. UNIFIED THEORY OF ACCEPTANCE AND USE OF TECHNOLOGY MODEL (UTAUT)**

The combination in the UTAUT model of the theories that been point out in previous studies, make it an appropriate model of technology acceptance [14]. The major advantage of using the model suggested by Venkatesh is that it has included the demographic and experience as factor in the model itself [15]. This makes it more suitable to be used for a product or service oriented research in b2c area. The traditional TAM models were more often used to adoption of technologies (computers, IT) at the workplace where an individual may not have a free will to say no to such technologies. The exploration of current literature that utilized the UTAUT model influenced the investigator to accept the model to support survey the acceptance levels of Kuala Lumpur users. This study will highpoint the key factors in the acceptance of m-commerce services.

The adopted model focuses on the factors that might encourage the users to use m-commerce services that been provided by banks and companies[15].Repeated the necessity to examine the model in diverse contexts. Since its general factors have not yet been tested from a banks and mobile apps company’s viewpoint in enough settings; in particular, settings in the Kuala Lumpur and other Malaysia states. Nevertheless, the purpose of using the UTAUT model is to do the examination a set of variables, which could predict m-commerce acceptance and use[3] [16] Furthermore, this examination has helped from the outcomes of related studies on the UTAUT model that described their material from developed countries base on m-commerce and other industries, [17] [18] [19] [20]It is important for this research to evaluate these factors when operate an examination on consumer intention to use m-commerce services in Kuala Lumpur.

To address the measurement of performance expectancy 5 questions were selected 5 point Likert scale ranging from strongly disagrees to strongly agree. Based on Table (2) the overall mean of all indicators was 3.88, which showed that the level of performance expectancy was higher than median of scale (3). According to descriptive statistic of related items to performance expectancy (2) the highest mean belongs to “Overall, I find mobile service useful in my daily task. “With (M=4, S.D=0.94) followed by “Mobile devices are useful tools for conducting online purchasing (e.g. buying clothes, hotel and airline reservations). “With (M=3.92, S.D=1.02). The lowest mean score was observed for last “I can do online purchasing faster in mobile devices than using desktop computers purchasing (e.g. buying clothes, hotel and airline reservations).” (M=3.71, S.D=1.07).

Statements	Mean	S.D
Most people who are important to me think	3.64	1.04

that it is a good idea for me to use my mobile for online purchasing (e.g. buying clothes, hotel and airline reservations).		
Most people who are important to me have encouraged me to use my mobile for online purchasing (e.g. buying clothes, hotel and airline reservation).	3.49	1.07
The social influence support the Malaysian people to use mobile device for online purchasing (e.g. buying clothes, hotel and airline reservation).	3.79	1.01
People who influence my behavior (such teachers, friends, actors, singers) think that I should use the mobile device for online purchasing	3.57	1.09
I do mobile online purchasing because many people are doing it (e.g. buying clothes, hotel and airline reservations).	3.41	1.19
In Malaysia most people are influenced by social media (e.g. Facebook, Tweeter and Instagram) to use m-commerce	3.85	1.00
.In general, customers in Malaysia are support the mobile devices for online purchasing.	3.82	0.93
Most people who are important to me think that it is a good idea for me to use my mobile for online purchasing (e.g. buying clothes, hotel and airline reservations).	3.64	1.04
<b>Total</b>	<b>3.65</b>	<b>0.83</b>

To address the measurement of social influence, 7 questions were selected 5 point Likert scale ranging from strongly disagrees to strongly agree. Based on Table (3) the overall mean of all indicators was 3.65, which showed that the level of social influence was higher than median of scale (3). According to descriptive statistic of related items to Social Influence (3) the highest mean belongs to “In Malaysia most people are influenced by social media (e.g. Facebook, Tweeter and Instagram) to use m-commerce.” With (M=3.85, S.D=0.99) followed by “In general, customers in Malaysia are support the mobile devices for online purchasing. “With (M=3.82, S.D=0.93). Last and least mean was related to “I do mobile online purchasing because many people are doing it (e.g. buying clothes, hotel and airline reservations).” (M=3.41, S.D=1.19).

Statement	Mean	SD
The general mobile devices are well equipped (including hardware, software, network) for doing online shopping (e.g. buying clothes, hotel and airline reservations).	3.27	1.05
It is easy to get the knowledge from (e.g. leaflet manual, user guide, and internet) necessary to do online purchasing by using mobile device.	3.23	1.012

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I think service providers should arrange customer service or technical support to help and guide costumers to do mobile transaction.	3.19	1.06
The m-commerce transactions are generally compatible with the online transactions through the desktop computer.	3.24	1.00
<b>Total</b>	<b>3.23</b>	<b>0.94</b>

To address the measurement of facilitating condition 4 questions were selected 5 point Likert scale ranging from strongly disagrees to strongly agree. Based on Table (4) the overall mean of all indicators was 3.23, which showed that the level of facilitating condition was close to the median of scale (3). According to descriptive statistic of related items to facilitating condition Table (4) the highest mean belongs to “The general mobile devices are well equipped (including hardware, software, network) for doing online shopping (e.g. buying clothes, hotel and airline reservations).” With (M=3.27, S.D=1.05) followed by “The m-commerce transactions are generally compatible with the online transactions through the desktop computer.” With (M=3.24, S.D=1.00) and lowest mean was related to “I think service providers should arrange customer service or technical support to help and guide costumers to do mobile transaction.” (M=3.19, S.D=1.06).

<i>Statements</i>	<i>Mean</i>	<i>S.D</i>
Among my peers, I am usually the first to explore new technology.	3.45	1.10
If I heard about a new technology, I would look for ways to experiment with it.	3.68	1.04
In general, I am hesitant to try out new information technology.	3.44	1.18
<b>Total</b>	<b>3.53</b>	<b>0.94</b>

To address the measurement of personal innovation 3 questions were selected 5 point Likert scale ranging from strongly disagrees to strongly agree. Based on Table (5) the overall mean of all indicators was 3.53, which showed that the level of personal innovation was higher than median of scale (3). According to descriptive statistic of related items to personal innovation Table (5) the highest mean belongs to “If I heard about a new technology, I would look for ways to experiment with it.” With (M=3.68, S.D=1.04) followed by “Among my peers, I’m usually the first to explore new technology.” With (M=3.45, S.D=1.01). Last and least mean was related to “In general, I am hesitant to try out new information technology.” (M=3.44, S.D=1.18).

<i>Statements</i>	<i>Mean</i>	<i>S.D</i>
Using my mobile for online purchasing (e.g. buying cloths, hotel booking, airline booking) reduces queuing time.	4.04	0.97
Using my mobile for online purchasing (e.g. buying cloths, hotel booking, airline booking) can occur at any time.	4.09	0.95
Using my mobile for online purchasing (e.g. buying cloths, hotel booking, airline booking) can happen at any place.	4.04	0.97
Using my mobile for online purchasing (e.g. buying cloths, hotel booking, airline	4.04	0.99

booking) is convenient because the mobile handset is always with me	4.05	0.87
<b>Total</b>	<b>4.05</b>	<b>0.87</b>

To address the measurement of mobility that 4 questions were selected 5 point Likert scale ranging from strongly disagrees to strongly agree. Based on Table (6) the overall mean of all indicators was 4.05, which showed that the level of mobility was higher than median of scale (3). According to descriptive statistic for items of mobility table (6) the highest mean belongs to “Using my mobile for online purchasing (e.g. buying cloths, hotel booking, airline booking) can occur at any time.” with (M=4.09, S.D=0.95) and all other items had the same mean score (M=4.04).

<i>Statements</i>	<i>Mean</i>	<i>S.D</i>
I worry about using public Wi-Fi for m-commerce purchasing.	3.87	0.99
I worry about the connection quality in my mobile.	3.83	0.98
I worry about safe transaction on my mobile.	3.95	0.98
I worry about how my personal information might be used for another purpose when I buy through mobile.	3.94	0.98
In my view, mobile transaction is unsecure.	3.39	1.09
I feel uncomfortable when I use m-commerce.	3.75	1.01
<b>Total</b>	<b>3.79</b>	<b>0.81</b>

To address the measurement of perceived risk, 6 questions were selected 5 point Likert scale ranging from strongly disagrees to strongly agree. Based on Table (7) the overall mean of all indicators was 3.79, which showed that the level of perceived risk was higher than median of scale (3). According to descriptive statistic of related items to perceived risk Table (7) the highest mean belongs to, “I worry about safe transaction on my mobile.” With (M=3.95, S.D=0.983) followed by “I worry about how my personal information might be used for another purpose when I buy through mobile.” With (M=3.94, S.D=0.97) and the lowest mean was observed for “In my view mobile transaction is unsecure.” (M=3.39, S.D=1.09).

<i>Statements</i>	<i>Mean</i>	<i>S.D</i>
The m-commerce service provider must be trustworthy.	4.22	0.87
The m-commerce payment service must give a reliable impression on me.	4.20	0.90
The m-commerce payment procedure has to use an accredited data encryption technique.	3.74	1.20
The m-commerce payment procedure has to be secure.	4.36	0.88
The personal information must be protected.	4.37	0.89
<b>Total</b>	<b>4.18</b>	<b>0.73</b>



To address the measurement of perceived trust 5 questions were selected 5 point Likert scale ranging from strongly disagrees to strongly agree. Based on Table (8) the overall mean of all indicators was which showed that the level of perceived trust was higher than median of scale (3). According to descriptive statistic of related items to perceived trust Table (8) the highest mean belongs to “The personal information must be protected” With (M=4.37, S.D=0.89) followed by “The m-commerce payment procedure has to be secure” With (M=4.36, S.D=0.88) and the lowest least mean was related to “The m-commerce payment procedure has to use an accredited data encryption technique.” (M=3.74, S.D=1.20).

**Table 9 : Descriptive statistic for Behavioural Intention (n=370)**

Statements	Mean	S.D
I intend to use mobile frequently for online purchasing (e.g. buying cloths, hotel booking, airline booking) in the next six months.	4	1.05
I plan to use mobile for online purchasing (e.g. buying cloths, hotel booking, airline booking) in the next six months.	3.86	1.05
I predict I would use mobile for online purchasing (e.g. buying cloths, hotel booking, airline booking) in the next six months.	3.87	1.05
Assuming I have access to mobile service , I intend to adopt it	3.86	1.10
I intend to use mobile frequently for online purchasing (e.g. buying cloths, hotel booking, airline booking) in the next six months.	4	1.05
<b>Total</b>	<b>3.91</b>	<b>0.92</b>

To address the measurement of Behavioral Intention 4 questions were selected 5 point Likert scale ranging from strongly disagrees to strongly agree. Based on Table (9) the overall mean of all indicators was 3.90, which showed that the level of Behavioral Intention was higher than median of scale (3). According to descriptive statistic of related items to Behavioral Intention table (9) the highest mean belongs to “I intend to use mobile frequently for online purchasing (e.g. buying cloths, hotel booking, airline booking) in the next six months.” With (M=4, S.D=1.051) followed by “Assuming I have access to mobile service, I intend to adopt it.” With (M=4.98, S.D=1.08). The “I predict I would use mobile for online purchasing (e.g. buying cloths, hotel booking, airline booking) in the next six months.” Had a mean value of (M=3.87, SD=0.986). In addition, the “I worry about the connection quality in my mobile”. Had mean value with (M=3.87, SD = 1.097). Moreover, the last and least mean was related to “I plan to use mobile for online purchasing (e.g. buying cloths, hotel booking, airline booking) in the next six months.” (M=3.68, S.D=1.045).

**Table 10: Descriptive statistic for Use Behaviour (n=370)**

Statements	Mean	S.D
How often do you use M-commerce?	1.41	0.96
Experience on using the mobile device/phone for Banking	1.88	1.15
Experience on using the mobile	0.69	1.05

device/phone for hotel Booking		
Experience on using the mobile device/phone for online Shopping	1.55	1.08
<b>Total</b>	<b>1.39</b>	<b>0.76</b>

The respondents use behavior of m-commerce were studied using five items based on the 4-point Likert scale ranging from “never” to “Frequent”. As shown in Table (10) with regards to *use behavior*, the statement “Experience on using the mobile device/phone for Banking” had the highest mean score with (M=1.88, S.D=1.15), whilst the statement “Experience on using the mobile device/phone for hotel Booking” had the lowest mean score with (M=0.69, S.D=1.05). The overall mean for use behavior of m-commerce was M=1.39, which was less than the median of scale (1.5) which revealed an almost moderate level for use behaviour of m-commerce.

## VII. DEMOGRAPHIC CHARACTERISTICS

Participant demographic data was collected to explore background factors. Demographic factors considered in this study for physician are as follow: gender. Age, educational level, nationality, marital status and income. As illustrated in table 4.6 the respondents were predominantly male. Comprising (52.7%) of the sample. Whereas only (47.3%) of the respondents were female. The majority of the respondents were between the ages of 30 to 39 years (34.6%), the lowest frequency was observed in the age below 20 years old (0.3%). Regards to nationality most of participants were Malaysian (63%). In term of education results showed that the majority of participants reported as bachelor degree , diploma and professionals (42.4%) followed by post graduate degrees (42.2%). Regarding the marital status majority of respondents were single (54.5%) followed by married (45.5%). Based on the results of income, the highest frequency belonged to the respondent with an income between Rm 1 to 1000 per month (35.4%) followed respondents who had an income between Rm 1000 to 3000 (23.8%) The lowest frequency belonged to respondents who had an income between Rm 6000 to 10000 per month (4.3%).

**Table 11 Respondents' frequency distribution based on respondents characteristics**

Variable	Table 11 Respondents' frequency distribution based on respondents characteristics		
	Level	Frequency	Percent
Gender	Male	195	52.7
	Female	175	47.3
Age	<20	1	0.3
	20-29	123	33.2
	30-39	128	34.6
	40-49	58	15.7
	50-59	41	11.1
	>60	19	5.1
Education	Diploma	57	15.4
	UG	157	42.4
	PG	156	42.2

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Variable	Table 11 Respondents' frequency distribution based on respondents characteristics		
	Level	Frequency	Percent
Marital	Single	200	54.5
	Married	167	45.5
Income	1-1000	131	35.4
	1000-3000	88	23.8
	3000-6000	67	18.1
	6000-10000	16	4.3
	<10000	68	18.4

## VIII. CONCLUSION AND DISCUSSION

To study m-commerce user acceptance in Malaysia, we have proposed a revised UTAUT model that incorporates the factors of the unique characteristics of m-commerce, we recommended that perceived trust, perceived risk, mobility and personal innovation should be included in the revised model. We propose to introduce specific moderating factors, namely, education level, marital and income. The "experience" and "voluntariness" from UTAUT's moderating factors were suggested to be excluded while the extended "user's demographics" should be added to the moderating factor's list. Following the establishment of the Theory, it is important that the revised model be tested in future: proper research questions are formulated, analysis is planned according to the type of research questions, research instrument is established to measure the structures of the research model and the data to validate the model are collected and analyzed. To check our updated UTAUT model empirically through various research techniques, including cross-sectional, observational case studies, focus groups, etc. The user adoption problems at various stages of the m-commerce growth as m-commerce progresses should be applied to recognize.

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