Mobile Commerce Usage in Malaysia

Assessing Key Determinants

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Abstract—**Despite the fact that there have been many researches done on mobile commerce abroad, there is much to explore and investigate in the case of Malaysia. The aim of this paper is to present findings on key determinants of mobile commerce usage in Malaysia. This study adopted quantitative approach and conducted survey among consumers Malaysia. This research shows that perceived ease of use, personal innovativeness, perceived trust, perceived cost, social influences and perceived usefulness are key determinants influencing consumers to adopt mobile-commerce.**

Keywords-mobile commerce; technology acceptance; Malaysia; behavioural intention;

I. INTRODUCTION

In contrast with electronic commerce, mobile commerce (m-commerce) presents unique features such as ubiquity, personalization, flexibility and localization. Mobile commerce works by connecting wirelessly to the internet, usually through telecommunication operators, to deliver product and service. Though mobile commerce appears to have favourable features compared to electronic commerce, Anil, Ting, Moe and Jonathan [1], Liang and Wei [2] discovered that mobile commerce have failed to meet its potentials, disregarding a few personal applications, such as ringtone downloads.

The birth of 3G in Malaysia can be traced back to year 2002. In this year, the Malaysian Communications and Multimedia Commissions (MCMC) assigned two of the three available 3G spectrum block to telecommunication players in Malaysia. However, the usage of 3G services in Malaysia has not evolved as hoped. In terms of mobile penetration rate, Malaysia is the second highest after Singapore in South East Asia Goi [3]. However, the numbers are small when it comes to mobile commerce usage in Malaysia, despite the availability of proper infrastructure and rich mobile contents Mohd and Osman [4] as well as positive intentions to use mobile services Ravendran [5].

Given the situation mentioned in the previous paragraph, the authors of this research is curious to investigate the factors that influence the usage of mobile commerce among Malaysian consumers. In order to fulfill this objective, this research attempts to review existing technology adoption theories and apply the theories in Malaysia context.

II. INTENTION TO USE MOBILE COMMERCE

In the domain of electronic commerce, Pavlou [6] explained that it is appropriate to examine consumers' intention to use a technology because intention possesses the willingness of a consumer to complete the whole transaction process. In contrast, examining actual use may often be unable to achieve due to unfavorable factors, such as slow web page retrieval [6]. Furthermore, behavioural intention has been empirically proven to predict actual usage ([7], [8], [9], [10]). Intention, therefore, is deemed appropriate to capture consumers' perception in using mobile commerce. In order to align with the objective of this study, we define our dependent variable specifically as "intention to use mobile commerce".

III. THEORETICAL MODEL DEVELOPMENT

A. Personal Innovativeness

Agarwal and Prasad [11] describe personal innovativeness as "a trait that leads to innovative behavior in the context of microcomputer interactions, expressed as the willingness of an individual to try out any new information technology". Rogers [12] explained that individuals with personal innovativeness are able to handle high levels of improbability and are able to cope better with accepting something new. In a study by Citrin, Sprott, Silverman and Stem [13], it is shown that personal innovativeness is able to predict consumer adoption of internet shopping.

B. Subjective Norms

According to Ajzen and Fishbein [14], subjective norm is "determined by his or her perception that salient social referents think he or she should or should not perform a particular behavior". Taylor and Todd [15] further elaborated that the referents could be either superiors or peers. Besides this, Hartwick and Barki [16] stated that if the potential user has no prior experience, the influence of subjective norms would be stronger due to the existence of referents. A user also would most likely to recommend a service to his acquaintance if he or she is satisfied with the service Fan, Saliba, Kendall and Newmarch [17].

C. Perceived Cost

In previous work done by Dekimpe, Parker and Sarvary [18], it was said that high income enables potential adopters to spend more thus making it easier for them to adopt a new innovation. Luarn and Lim [19] explained that cost factors include the cost of obtaining mobile device, the maintenance costs, usage costs and upgrading costs in the future. Antonelli [20] also argued that standard of living and economic development level influence adoption timing as well as diffusion speed. Anil, Ting, Moe and Jonathan [1] found that cost is one of the factors which influenced the adoption of mobile commerce in Singapore. Due to this, Muthaiyah [21] concluded that in order to have an effective penetration level of mobile technology, it was compulsory for a certain minimum level of income.

D. Perceived Trust

According to Nicholson, Compeau and Senthi [22], trust is a critical construct in multiple discipline areas. According to Morgan and Hunt, [23] and O'Malley and Tynan [24], trust is defined as a confidence between the parties that the other party is reliable and that the parties will act with a level of integrity when dealing with each other. Heffernan [25] summarized that within the realm of relationship marketing, trust has been recognized as an important variable for the success of relationships in the supplier literature [26], the channel literature [27], end consumer relationships literature [28] and lateral relationships literature [29].

In the works of McKnight and Chervany [30], it is stated that trust beliefs must exist from the consumers' side in order for a transaction to occur subsequently. Based on the views of McKnight and Chervany, [30] and Poong, Eze and Talha [31], trust is when "one believes that the other party has one or more characteristics beneficial to oneself" while trusting intention means "one is willing to depend on, or intends to depend on, the other party even though one cannot control that party".

E. Perceived Ease of Use

Perceived ease of use is undoubtedly the most researched characteristics in Information Technology related innovation. Davis [7] included perceived ease of use in TAM model while Rogers [12] studies perceived complexity in diffusion of innovation. Moore and Benbasat [32], however, regard both perceived ease of use and perceived complexity are the same, in the sense that they are only conceptually opposite with each other. An innovation can be judged in the continuum of easy to use to difficult to use. Innovation that is perceived to be easy to use will gain faster acceptance by the potential adopters due to lower learning curve imposed. In this research context, perceived ease of use is defined as the degree to which a consumer believes that using e-commerce to purchase products or services would be effort-free. Davis [7] posits that perceived ease of use does not have direct effect on behavioural intention to use. Empirical studies in e-commerce, however, found that perceived ease of use do increase consumers' behavioural intention to shop online (e.g. [33]) empirical work found support of the relationship between perceived ease of use and consumers' intention to shop online

F. Perceived Usefulness

Perceived usefulness is defined as the perceived of usefulness of a system as the degree to which consumers believe that using the new technology will enhance their task performance. Existing research shows that that perceived usefulness has an effect on consumers' intention to adopt, for example as in Venkatesh and Morris [34]. Consumer evaluates his or her options in terms of perceived of usefulness and base their choices of behavior on the desirability of the perceived usefulness. Due to this fact, perceived usefulness will have an effect on their choice to adopt mobile commerce. Therefore, perceived usefulness is classified as the level to which a consumer believes that by adopting Mobile Commerce, it will help the consumer to improve his or her job performance.

G. Theoretical Model

Based on the literature review, key determinants have been identified as possible key determinants of mobile commerce adoption in Malaysia. The determinants include personal innovativeness, subjective norms, perceived cost, perceived trust, perceived ease of use and perceived usefulness. Following the argument in the literature review, the dependent variable in this study is "intention to use mobile commerce". Fig. 1 depicts the theoretical model in this study.

Consequently, the hypotheses for this study are:

H1: Personal innovativeness will have a positive effect on the intention to use Mobile Commerce in Malaysia.

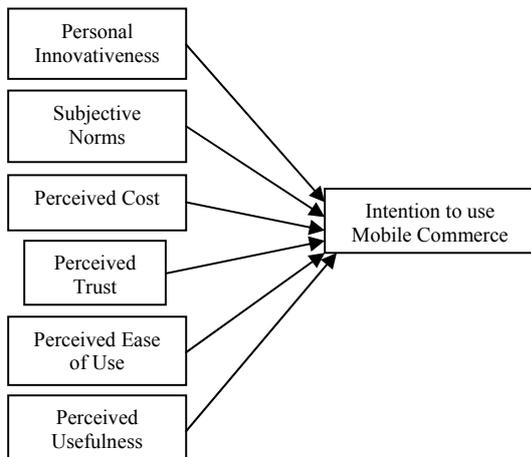H2: Subjective norm will have a positive effect on the intention to use Mobile Commerce in Malaysia.

Figure 1. A theoretical model of mobile commerce usage in Malaysia

H3: Perceived cost will have a negative effect on the intention to use Mobile Commerce in Malaysia.

H4: Perceived trust will have a positive effect on the intention to use Mobile Commerce in Malaysia.

H5: Perceived ease of use will have a positive effect on the intention to use Mobile Commerce in Malaysia.

H6: Perceived usefulness will have a positive effect on the intention to use Mobile Commerce in Malaysia.

IV. METHODOLOGY

A total of 320 survey questionnaires, using both online and paper survey, were distributed to consumers in Malaysia using a snowball sampling method. The sampling method was chosen due to the fact that it is easier to penetrate the targeted group of respondents by using their acquaintances. Targeted respondents are Malaysians who possess mobile communication device. The questionnaire consists of two sections, in which the first section comprises of demographic questions. Second section consists of items to measure constructs identified in the literature review using a five-point Likert scale. Pilot testing was done prior to the actual survey to ensure item reliability and validity.

V. DATA ANALYSIS

Of 280 returned questionnaires, a total of 260 questionnaires were deemed fit, resulting in an 81.25% of distributed questionnaires. Table I presents the demographic profile of the respondents. From the table, it is shown that most of the respondents are male (51.2 %). As for ethnicity, the highest number of respondents was Chinese (36.9%). As for the income level, majority of the respondents were from the RM2000- RM 2499 income group. Based on the data collected, it is evident that most of the respondents are Celcom subscribers (41.9 %).The most number of

TABLE I. RESPONDENTS DEMOGRAPHIC PROFILE

Demographic	Frequency	Percentage	Cumulative Percentage

Gender			
Male	133	51.2	51.2
Female	127	48.8	100.0
Age			
20-25 years	83	31.9	31.9
26-30 years	115	44.2	76.2
31- 35 years	58	22.3	98.5
36-40 years	4	1.5	100.0
Ethnicity			
Malay	90	34.6	34.6
Chinese	96	36.9	71.5
Indian	69	26.5	98.1
Others	5	1.9	100.0
Income (RM)			
< 1500	52	20.0	20.0
1500 – 1999	62	23.8	43.8
2000 – 2499	76	29.2	73.1
2500 – 2999	48	18.5	91.5
> 3000	22	8.5	100.0
Mobile Service Provider			
Maxis	99	38.1	38.1
Celcom	109	41.9	80.0
Digi	44	16.9	96.9
U-Mobile	8	3.1	100.0
Expertise			
Information Technology	90	34.6	34.6
Engineering	69	24.5	61.2
Business and Management	86	33.1	92.2
Others	15	5.8	100.0

respondents were those from the Information Technology field with 34.6 %.

Subsequently, item reliability is assessed using Cronbach Alpha to measure item internal consistency. Table II depicts the reliability indices for each of the item. The statistics show that all items exhibit acceptable reliability, suggesting high internal consistency among items. Next, factor analysis using Varimax rotation is used to assess items validity, in order to ensure each item loads into its intended construct. The factor loading for each item is greater than 0.50 and loads into its intended construct.

Table III shows the correlation matrix among constructs. The correlation values are less than 0.500, with values range from 0.096 to 0.403, indicating no serious multicollinearity issues in the data set.

TABLE II. RELIABILITY STATISTICS FOR INDEPENDENT AND DEPENDENT VARIABLE

Variable	Mean	α	No of Item
Perceived Ease-of-Use	3.779	0.839	5
Personal Innovativeness	3.669	0.824	5
Perceived Usefulness	3.628	0.826	5
Perceived Trust	3.334	0.801	5
Perceived Cost	3.267	0.826	4
Subjective Norm	3.672	0.891	4
Intention	3.641	0.825	4

TABLE III. CORRELATION MATRIX AMONG CONSTRUCTS

Constructs	PEOU	PI	PU	PT	PC	SN
PEOU	1	0.313	0.365	0.206	0.258	0.403
PI		1	0.255	0.183	0.292	0.333
PU			1	0.222	0.320	0.385
PT				1	0.096	0.287

					1	0.281
PC						
SN					1	

PEOU: Perceived Ease of Use, PI: Perceived Innovativeness, PU: Perceived Usefulness, PT: Perceived Trust, PC: Perceived Cost, SN: Subjective Norm

This study adopts multiple regression analysis to test the hypotheses. The r-square value of the multiple regression model is 0.649, implying that the constructs identified in this study explain 64.9% of the variance of intention to use mobile commerce. Analysis shows that the relationship between perceived innovativeness and intention to use mobile commerce is significant at $p<0.05$, with a beta value of 0.172, thus supporting H1. H2 is supported as well, with a beta value of 0.300 (p=0.000). The relationship between perceived cost and intention to use mobile commerce is statistically significant ($\beta=0.265$, p=0.000), supporting H3. H4 and H5 are supported with beta values 0.138 (p=0.001) and 0.164 (p=0.000) respectively. Finally, statistically significant relationship is also observed between perceived usefulness and intention to use mobile commerce ($\beta=0.205$, p=0.000), thus supporting H6.

VI. DISCUSSION

Empirical data from this study strongly support the proposed theoretical model. As hypothesized, personal innovativeness, perceived ease of use and perceived trust are important predictors for mobile commerce usage among Malaysian consumers. Interestingly, perceived usefulness, perceived cost and subjective norms have higher explained variance compared to the other three predictors. Perhaps, respondents are familiar with technology interface; hence perceived ease of use may not be the strongest predictor. Personal innovativeness is more of a personal trait that exists in a handful of individuals but not in others [11]. It may be the number of respondents with high personal innovativeness is low for this sample. Another possible reason could be respondents in this study are mentally ready to adopt mobile commerce since Malaysian telecommunication operators begin to roll out lower costs of mobile broadband in year 2010 compared to previous years. Consistent with the findings from Poong, Eze and Talha [31], perceived trust has a low explained variance compared to other predictors in electronic commerce as well. This could be due to the fact that less awareness is instilled among Malaysian consumers. A specialized study to discover the understanding of online commerce trust may be conducted in the future. On the other hand, Malaysian consumers are more concerned with the cost and usefulness of using mobile commerce, as evidenced from the empirical data. This is consistent with the medium average household income of between 3750 Ringgit Malaysia or USD1209 per month [35]. With the rising living cost, Malaysian consumers are more conscious on optional services. Malaysians tends to be collectivists in general. Hence, social influence or subjective norms asserts substantial influence in adopting innovation, such as mobile commerce.

From the perspective of theory advancement, this study confirmed some salient predictors of key beliefs in mobile commerce adoption. The predictors in this study have explained variance ranging from 13.8% to 30% on the dependent variable. Overall model explains 64.9% of the mobile commerce adoption, though there are still 35.1% of the variance is not captured by this model. Nonetheless, this study contributes to the existing mobile commerce literatures by providing an insight from Malaysian perspectives. The findings complements previous works performed in Malaysia limited number of studies in Malaysia compared to other studies performed in developed countries.

The findings from this study are essential for practitioners whom intend to venture into mobile commerce in Malaysia. As the demographic data indicates, the result of this study is a representation of targeted mobile commerce users. As Malaysia is going into 4G network in November 2010, the opportunities for mobile commerce are vast, provided that practitioners understand potential users' behavioral intention to use mobile commerce. As suggested by the result, an effective promotion among targeted users to use mobile commerce would create more impact on mobile commerce adoption, followed by reasonable service charges and developing useful applications.

VII. CONCLUSION

This purpose of this study is to discover factors that impact Malaysians to adopt mobile commerce. Mobile commerce possesses the characteristics of mobility and broad reach. While other countries may already enjoying high speed wireless telecommunication network, Malaysia has just received another 4G service from telecommunication service provider in 27th November 2010. Nonetheless, according to a market research, there are 85.1% of Malaysians are using mobile phones, two places behind Singapore [36]. This shows that potential of mobile commerce in Malaysian market is very huge. Being in the development stage, this study on consumers' behavioral issues appears to be suitable as reference both for researchers and practitioners [37]. As the result of this study shows, social relationships and networks are important criteria for mobile commerce adoption in Malaysia. This is consistent with other mobile commerce studies conducted in developing countries, such as Ghana, in which people are low in individualism [38].

This study could be extended to include more relevant constructs, since there are still 35.1% of variance are unexplained in this theoretical framework. One of the hints presented from the result is to include more social related constructs, since Malaysian is still considered as a collectivist society. Another possible detailed research could be done in identifying moderating variables based on existing constructs in this theoretical framework. The output may be interesting, both for research and practice, to discover predictors that could boost users to adopt mobile commerce in Malaysia.

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