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Continuance Intention of Mobile Commerce Usage Activities: Does Personal Innovativeness Matter?

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Abstract: This research aims to examine Malaysian consumers' mobile commerce continuance intention by integrating the Expectation-Confirmation Model (ECM) with personal innovativeness. Data was collected from 122 consumers who had prior experience using mobile commerce activities and analyzed using Partial Least Squares Structural Equation Modelling (PLS-SEM) technique. Findings revealed that satisfaction and personal innovativeness were found to be significantly related to continuance intention, explaining 36% of the variance. Surprisingly, perceived usefulness was found to have no significant relationship with continuance intention. Finally, limitations, recommendations for future research and implications of the study are also elaborated.

Key words: Confirmation, continuance intention, perceived usefulness, personal innovativeness, satisfaction

INTRODUCTION

Of late extensive research has been done in the areas of customer retention strategies in the telecommunication industry (Peng *et al*., 2013). Many agree that the ultimate goal is to obtain as many loyal customers as possible. Nevertheless, the prevalence of electronic commerce or e-commerce makes the retention of existing customers even more difficult (Tamaddoni *et al*., 2010). Peng *et al*. (2013) assert that with competition just ''one click away'' and unprecedented customer empowerment, the churn rate of customers is likely to increase. Apart from that, the fact that e-commerce users are bound by geographical constraint further evoke the need for mobility and broad reach of conducting E-commerce transactions ubiquitously. Since then, the world welcomes the technology of mobile commerce.

Mobile commerce, better known as m-commerce, is undeniably one of the fastest growing technologies after the birth of the Internet. Unlike, its predecess or which is E-commerce, consumers all over the world are no longer restricted to geographical constraints in order to engage in mobile commerce activities. The fact that mobile commerce provides ubiquity which means that consumers can conduct transactions anytime, anywhere over wireless telecommunications networks, further boost up the number of mobile phone subscribers throughout the world.

In addition, the worldwide mobile phone users are recorded as 3 billion in 2007, >4 billion in 2013 and is now expected to cross 5.1 billion by 2017. A report by International Telecommunication Union states that the number of mobile subscribers reached 6.8 billion and there were as many as 2.1 billion mobile broadband subscriptions worldwide in 2013. Undeniably, mobile technology acts as a key driver for speedy Information Communication Technology (ICT) growth in many world regions. Hence, the escalation in wireless and mobile communications worldwide has significantly changed the way individuals communicate, access and share information (Sultan *et al*., 2009).

Surprisingly, the prevalence of mobile commerce markets in the Asian region far surpassed its counterparts in the United States and Europe. China and India both account for 1.854 billion mobile subscribers out of 6.835 billion mobile subscriptions worldwide. Moreover, it is reported that Asian countries such as Korea, Japan, Taiwan and Singapore appear to be more matured in terms of their mobile commerce market compared to those of many other countries (Zhang *et al*., 2012).

The impact of mobile phone technologies are vast, among which are accounting for the greater than ever accessibility, frequency and speed of communication (Balasubramanian *et al*., 2002), creating new markets and opportunities as well as changing the competitive landscape of business, existing communit and market

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structures (Stewart and Pavlou, 2002). This phenomenon has made consumers becoming more and more sophisticated in their daily life and the demand for a better mobile commerce service would increase along with their mobile commerce usage. Nevertheless, the post-adoption behavioral intention studies which include satisfaction and continuance intention in mobile context gain less attention among researchers as opposed to the pre-adoption and the actual usage studies (Chong, 2013a). Varnali and Toker (2010) point out that in spite of tremendous attention on consumers' behavioural intention and actual usage of mobile services not much research has been done on customer satisfaction and continuance intention. The focus on post-adoption or post-purchase behavior has been somewhat deserted even though there are past studies that stress on the importance of understanding the continuance usage intention (Varnali and Toker, 2010; Chong, 2013a). Chong (2013b) stresses that understanding the continuance intention is equally important. Mobile commerce users are irregular in their actions and they may not return to the activity once they leave (Lin *et al*., 2005). Therefore, attracting users and maintaining their continuance usage is crucial for the success of mobile commerce (Chong, 2013a).

Hung *et al*. (2007) concurs that satisfaction alone is inadequate for explaining the continuance intention phenomenon. The characteristics of the individuals adopting or considering the adoption of information technology innovation also play an important role in their intention to adopt innovation (Sun and Jeyaraj, 2013). Moreover, consumers' level of innovativeness would determine whether or not they would continue using the technology. Hence, an individual characteristic such as personal innovativeness is added in the study. This study attempts to empirically validate the extended expectation-confirmation Model by incorporating it with personal innovativeness.

Overview of mobile commerce: Many prominent authors and researchers in the previous studies consider mobile commerce as an extension of E-commerce and is to a certain extent, similar to electronic commerce (Chong *et al*., 2012). The only difference is that mobile commerce transactions are wirelessly conducted with the use of mobile devices. However, Feng and coauthors argue that there is much more in mobile commerce than merely an extension of electronic commerce. They claim that mobile commerce has different interactions with users, usage pattern and value chain, thus offering business models that are not available to electronic commerce. Tiwari and Buse (2006), on the other hand, provide a clear distinction between mobile commerce and electronic commerce by viewing mobile commerce as mobile business and expanding its scope beyond monetary transactions. This study adopts the definition by Tiwari and Buse (2006) as they believed that mobile commerce should not be limited to monetary transactions and it should not neglect other activities such as the after sales services and sending information to the customers.

Mobile commerce usage activities: Mahatanankoon *et al*., (2005) categorized mobile commerce usage activities as content delivery, transactions, location-based services, emergency purposes and entertainment purposes. Apart from that, a study by Chong (2013b) divides mobile commerce activities into content delivery, transactions, location-based services and entertainment. Content delivery deals with using a mobile device to search for and find information on the internet whereas transactions involve using a mobile device to transfer money between consumers and businesses, while location-based services involve activities such as receiving time-sensitive discount tickets or coupons and receiving personal advertisements (Mahatanankoon *et al*., 2005). Lastly, entertainment involves using a mobile device for entertainment purposes such as playing games or listening to music (Chong, 2013b). This study embraces the four categories of mobile commerce usage activities empirically validated by Chong (2013b).

Expectation-confirmation model: Expectation-Confirmation Model (ECM) was proposed and empirically examined by Bhattacherjee (2001) in a study on American online banking users. Bhattacherjee posits that consumers' intention to continue their information system usage is based on three factors which are the users' satisfaction with the information system, the extent of their confirmation and their post-adoption behavior which is measured by perceived usefulness (Chong, 2013a). As mobile commerce is a type of information system, many past researchers employ ECM in their continuance intention studies.

ECM has been applied extensively to understand consumers' satisfaction and their post-purchasing behavior by various researchers. Unlike other technology adoption models, ECM has the ability which allows a comparison of users' pre-adoption and post-adoption perceptions and their satisfaction with their current information system usage (Chong, 2013a). Nevertheless,

Table 1: Selected studies on mobile commerce continuance usage intention

Author	Constructs studied	Major findings
Kim and Steinfield (2004)	Information quality, connection quality, ease of use, service charges, satisfaction and user continuance intention	Information quality, connection quality, ease of use and service charges significantly influence satisfaction and user continuance intention for mobile Internet services
Hong *et al.* (2006)	Perceived usefulness, perceived ease of use, confirmation, satisfaction, and continued information technology usage intention	The hybrid model integrating the Expectation-Confirmation Model and Technology Acceptance Model has the highest explanatory power of user continuance intention for mobile Internet services
Thong *et al.* (2006)	Perceived ease of use, perceived usefulness, perceived enjoyment, confirmation, satisfaction, and continued information technology usage intention	The findings support the expanded Expectation-Confirmation Model which includes perceived ease of use and perceived enjoyment in predicting user continuance intention for mobile Internet services
Kim *et al.* (2008)	Usefulness, usability, system quality, social influence, compatibility, ubiquitous connectivity, perceived cost, perceived value, behavioural intention, and user type	Usefulness and social influence affect perceived value of mobile data services more strongly for discontinuers than for continuers
Lin and Shih (2008)	Mobile technology trusting expectation, mobile vendor trusting expectation, personal values, disconfirmation, performance, satisfaction and continuance intention	Personal values and trust influence satisfaction, which influences continuance intention of mobile commerce services
Kim *et al.* (2010)	Post-usefulness, post-monetary value, post-ease of use, post enjoyment, uncertainty avoidance, satisfaction,and continuance intention	Intrinsic motivations (post-ease of use and post-enjoyment) and extrinsic motivations (post-usefulness and post-monetary value) influence both satisfaction and continuance intention significantly Uncertainty avoidance moderates the effect of these motivations
Ng and Kwahk (2010)	Service user satisfaction, perceived value, familiarity, switching costs, and continuance intention	Service user satisfaction, perceived value, and familiarity influence continuance intention significantly
Chen *et al.* (2012)	Information quality, system quality, process quality, perceived usefulness, confirmation, satisfaction, hedonic value, and continuance intention	Perceived usefulness, satisfaction, and hedonic value significantly influence continuance intention
Hung *et al.* (2012)	Confirmation, perceived usefulness, satisfaction, trust, and continued intention	Trust can overcome the limitations of ECM (lacking in intrinsic motivation) and improve the explanatory power of initial ECM
Hsiao and Chang (2014)	Perceived value, perceived trust, confirmation, perceived usefulness,satisfaction, and continuance intention	All supported except perceived trust does not significantly related to satisfaction
Chong (2013a)	Perceived ease of use, perceived usefulness, perceived enjoyment, trust, perceived cost, confirmation satisfaction and continuance intention	Perceived ease of use, perceived usefulness, perceived enjoyment, trust, perceived cost, satisfaction significantly influence continuance intention. perceived ease of use and perceived cost have no significant relationship with satisfaction
Lu (2014)	Social influence, personal innovativeness, perceived usefulness, perceived ease of use, mobile commerce continuance intention	Personal innovativeness and perceived usefulness significantly continuance intention influence continuance intention.Social with influence and perceived ease of use have no significant relationship with continuance intention
Kim *et al.* (2008)	Confirmation, perceived usefulness, perceived enjoyment , perceived switching costs, user satisfaction, continuance intention	User satisfaction and perceived switching costs significantly influence continuance intention.Perceived usefulness and perceived enjoyment do not influence continuance intention

Chen *et al.* (2012)

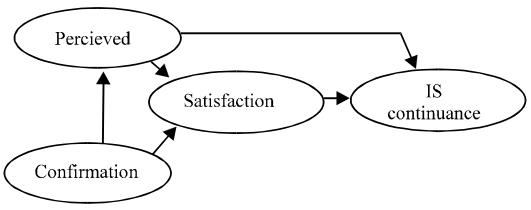

Fig. 1: Post-acceptance model of information system continuance (Bhattacherjee, 2001)

many past studies agree that there is one thing lacking in ECM which is it excludes some commonly identified determinants (Chong, 2013a; Hsiao and Chang, 2014; Hung *et al*., 2012; Valvi and West, 2013). Figure 1 illustrates the original ECM.

Consumers' continuance intention: Consumers' continuance intention is the main dependent variable for any information system continuance intention studies. According to Bhattacherjee (2001), continuance intention is defined as the users' intention to continue using the information system. Continuance intention is a post-acceptance construct that is posited in the original ECM by Bhattacherjee (2001). As it is a construct measured after the actual usage has taken place, some studies operationalized continuance usage intention as the act of loyalty intention. Many past studies in mobile commerce found significant relationships between perceived usefulness and continuance intention as well as satisfaction and continuance intention (Hong *et al*., 2006; Thong *et al*., 2006; Kim *et al*., 2010; Chen *et al*., 2012; Hsiao and Chang, 2014; Chong, 2013a). Table 1 summarizes selected studies on mobile commerce continuance usage intention.

Consumers' satisfaction: Satisfaction is defined as the users' affect with feelings about prior information system use (Bhattacherjee, 2001). Hsiao and Chang (2014) further explain in their study that satisfaction is the positive

emotional state resulting from a consumer's use of mobile advertising. ECM posits that user satisfaction is determined by two constructs; expectation of the information system and confirmation of expectation following actual use. Expectation provides the baseline level, against which confirmation is assessed by users to determine their evaluative response or satisfaction (Bhattacherjee, 2001).

Consumers' confirmation: Bhattacherjee (2001) defines confirmation as the users' perception of the congruence between expectation of information system use and its actual performance. Bhattacherjee (2001) further concurs that confirmation is positively related to satisfaction with information system use because it implies realization of the expected benefits of information system use while disconfirmation (perceived performance lagging expectation) denotes failure to achieve expectation. Bhattacherjee (2001) also notes that consumers' confirmation after using online banking has a positive relationship with satisfaction and perceived usefulness. Additionally, according to Chong (2013a), the extent of confirmation will reinforce and positively affect the level of user satisfaction and perceived usefulness of mobile commerce service.

Perceived usefulness: Perceived usefulness is defined by Bhattacherjee as the users' perception of the expected benefits of information system. Perceived usefulness represents the post-expectation aspect in the original ECM. Bhattacherjee (2001) believes that perceived usefulness is an adequate expectation in the information system continuance context because it is the only belief that is demonstrated to consistently influence user intention across temporal stages of information system use. A study by Lu (2014) revealed that perceived usefulness significantly influences continuance intention. On the contrary, Kim *et al*., (2014) found that perceived usefulness does not influence continuance intention.

Personal innovativeness: Agarwal and Prasad (1998) initially consider innovativeness as a determinant of information technology acceptance. They define personal innovativeness as the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than other members of a social system. Interestingly, Lu (2014) found that perceived user personal innovativeness serves as primary determinants of mobile commerce continuance intention among American university students. Personal innovativeness has been studied extensively in information technology adoption and it is one of the salient individual characteristics examined in technology adoption research (Kwon *et al*., 2007).

MATERIALS AND METHODS

Subjects of this research were individuals who used mobile commerce activities. Questionnaires were administered to undergraduate students from a public university in Malaysia. The university students chosen as the subjects in this study are deemed appropriate for several reasons. Firstly, a hand phone users survey conducted by Malaysian Communications and Multimedia Commission (2013b) revealed that, surprisingly, 32.5% of smartphone users are full time students, and in terms of schooling status, 53.5% of them are university students. Secondly, in a study conducted by Ooi *et al*. (2011) among university students in Malaysia found that university students are highly dependable to the network usage in their routines and thus, they are more open to new technology.

As this is an exploratory research in terms of the continuance intention of mobile commerce usage activities in Malaysian context, it used a convenience sample approach. All respondents had prior experience with mobile commerce usage activities. A total of 200 surveys were distributed for the study. Incomplete surveys were discarded, leaving only 122 usable samples. The overall response rate for this study is 61%.

Five constructs were measured in this research; perceived usefulness, personal innovativeness, confirmation, satisfaction and mobile commerce continuance intention. The measurement items were adopted from different sources to suit the study. Items for continuance intention and confirmation were adapted from Bhattacherjee (2001a), Chong (2013a) and Bhattacherjee *et al*. (2008). Measurement items for satisfaction were adapted from Bhattacherjee (2001) and Chong (2013a) whereas items for perceived usefulness were adapted from Chong (2013a). Items for personal innovativeness, on the other hand were adapted from Agarwal and Prasad (1998). All items were measured on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

The processing of the data began after all of the required data had been gathered accordingly. Prior to the analysis, central editing was conducted to ensure only complete data were included. The dataset was coded and analysed using SPSS Statistics version 19.0. Frequency distribution analysis was used to generate demographic sample profile. Subsequently, Partial Least Squares (PLS) method using Smart PLS version 2.0.M3 was performed in order to substantiate the hypotheses.

Research framework and hypotheses: Figure 2 depicts the research framework that employs the ECM as the baseline model.

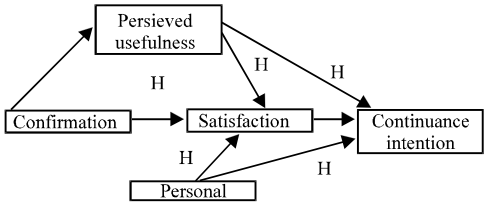

Fig. 2: Research framework

The following seven hypotheses are proposed:

- H_1: Consumers' satisfaction with mobile commerce is positively associated with their continuance intention
- H_2: Consumers' extent of confirmation is positively associated with their satisfaction with mobile commerce
- H_3: Consumers' extent of confirmation is positively associated with their perceived usefulness of mobile commerce
- H_4: Consumers' perceived usefulness of mobile commerce is positively associated with their satisfaction with mobile commerce.
- H_5: Consumers' perceived usefulness of mobile commerce is positively associated with their continuance intention
- H_6: Consumers' personal innovativeness of mobile commerce is positively associated with their satisfaction with mobile commerce
- H_7: Consumers' personal innovativeness of mobile commerce is positively associated with their continuance intention

RESULTS AND DISCUSSION

Sample profile: The demographic of the respondents tabulated in Table 2 was derived from descriptive analysis. The majority of the age group (99.2%) is in the category of 21-25 year old. Females (69.7%) outnumber the males (30.3%). All of the respondents are Bachelor degree students (100.0%). In terms of ethnicity, the majority of the respondents are Malay (70.5%), followed by Chinese and others with 28.7% and 0.8%, respectively. Table 3 tabulates the mobile commerce usage among the respondents. The majority of the respondents (45.1%) use Celcom as the mobile gadget service provider with most of them (91.8%) are smartphone users. A total of 69.7% of the respondents are aware of mobile commerce usage activities even before participating in this survey. Of all mobile commerce usage activities, mobile messaging (90.2%) is the most highly used service among the respondents, followed by mobile social

Table 2: Demographic of the respondents

Profile	Description	Frequency	Percentage (%)
Gender	Male	37.0	30.3
	Female	85.0	69.7
Ethnic group	Malay	86	70.5
	Chinese	35.0	28.7
	Others	1.0	0.8
Age	20 year or less	1.0	0.8
	21-25 year	121.0	99.2
Study programme	Bachelor degree	122.0	100.0

Table 3: Mobile commerce usage

Profile	Description	Frequency	Percentage (%)
Mobile gadget service provider	Celcom	55.0	45.1
	DiGi	28.0	23.0
	Maxis	35.0	28.7
	UMobile	2.0	1.6
	Others	2.0	1.6
Smartphone	Yes	112.0	91.8
	No	10.0	8.2
Tablet computer	Yes	22.0	18.0
	No	100.0	82.0
Other mobile gadget	Yes	8.	6.6
	No	114.0	93.4
No. of mobile gadget owned	1	105.0	86.0
	2	14.0	11.5
	3	3.0	2.5
Mobile commerce awareness	Yes	85.0	69.7
	No	37.0	30.3
Mobile commerce usage	Yes	122.0	100
Mobile entertainment	Yes	103.0	84.4
	No	19.0	15.6
Mobile information	Yes	70.0	57.4
	No	52.0	42.6
Mobile coupons	Yes	23.0	18.9
	No	99.0	81.1
Mobile messaging	Yes	110.0	90.2
	No	12.0	9.8
Mobile social network	Yes	109.0	89.3
	No	13.0	10.7
Mobile banking	Yes	37.0	30.3
	No	85.0	69.7
Mobile payment	Yes	17.2	
	No	101.0	82.8
Mobile internet	Yes	83.0	68.0
	No	39.0	32.0
Others	Yes	1.0	0.8
	No	121.0	99.2
Mobile commerce average usage	<once in a week	11.0	9.0
	Once in a week	2.0	1.6
	>once in a week	20.0	16.4
	Once in a day	9.0	7.4
	>once in a day	80.0	65.6
Mobile commerce	<1 h	9.0	7.4
	1-5 h	36.0	29.5
	6-15 h	41.0	33.6
	16-25 h	13.0	10.7
	>25 h	23.0	18.9
Mobile commerce frequency of usage	Extremely infrequent	2.0	1.6
	Quite infrequent	13.0	10.7
	Slightly frequent	30.0	24.6
	Quite frequent	46.0	37.7
	Extremely frequent	31.0	25.4

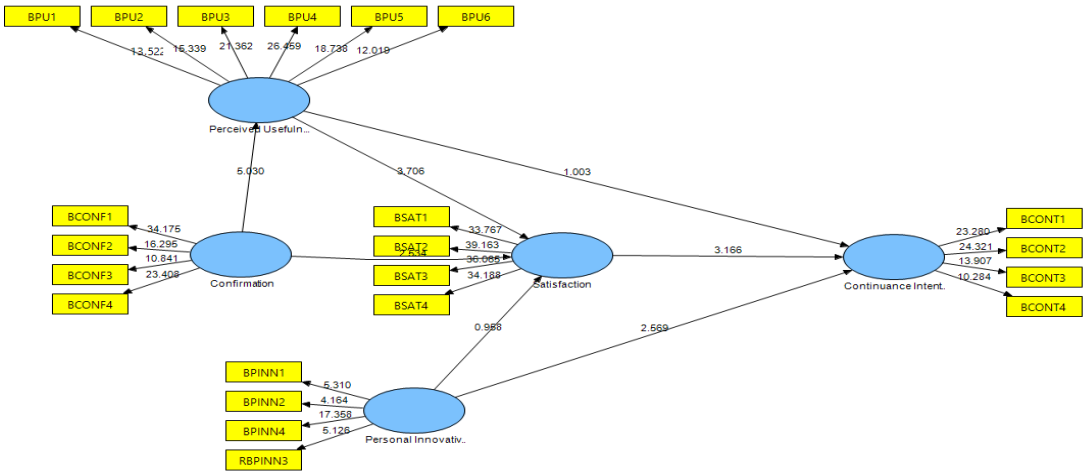

Fig. 3: The research model

Table 4: Test of normality

Kolmogorov-Smimova			
Variables	Statistic	df	Sig.
Mean ONT	0.192	122	0.000

Illiefors significance correction

network (89.3%), mobile entertainment (84.4%), mobile Internet (68.0%), mobile information (57.4%), mobile banking (30.3%), mobile coupons (18.9%) and mobile payment (17.2%). About 65.6% and 33.6% of the respondents claim to have average mobile commerce usage of more than once in a day and approximately 6-15 hours of usage in a week, respectively. Finally, most of the respondents (37.7%) affirm that they are quite frequent in using mobile commerce activities in their daily life.

As shown in Table 4, test of normality was done on the dataset. In this case, Sig. value is 0.000, suggesting violation of the assumption of normality. Thus, Smart PLS version 2.0. M3, a variance based Structural Equation Modelling (SEM) was employed to analyze the hypotheses generated. This technique was chosen due to PLS makes fewer demands regarding sample size than the other methods as well as PLS does not require normal-distributed input data (Urbach and Ahlemann, 2010).

The two-step analytical procedure suggested by Anderson and Gerbing (1988) was adopted to analyze data whereby the measurement model was evaluated first and then followed by the structural model. Correspondingly, following the suggestion of Chin (1998), the boots trapping method (200 resamples) was done to determine the significant level of loadings, weights and path coefficients. Figure 3 shows the research model of the study.

Measurement model: Construct validity of a proposed measurement theory needs to be assessed before proceeding further analysis. Hair *et al.* (2009) states that construct validity is the extent to which a set of measured variables actually represents the theoretical latent construct those variables are designed to measure. Construct validity is made up of two important components; convergent validity and discriminant validity. Both of the components need to be analyzed. Convergent validity is the extent to which indicators of a specific construct converge or share a high proportion of variance in common and it comprises three approaches which are factor loadings, variance extracted and reliability. According to Hair *et al.* (2009), factor loadings and Average Variance Extracted (AVE) of ≥0.50 and Composite Reliability (CR) value of 0.70 or above is deemed to be acceptable.

The measurement model yielded results as in Fig. 4. As Table 5 displays, all loadings and AVE are above 0.50 and the composite reliability values are ≥0.70. Therefore, it can be concluded that convergent validity has been established.

Afterward, discriminant validity was assessed. Discriminant validity is the extent to which a construct is truly distinct from other constructs. This can be established by the low correlations between all the measure of the interest and the measure of other constructs. To address discriminant validity, the square root of the AVE is compared against the correlations of the other constructs. Table 6 displays that discriminant validity has been established since the AVE extracted is greater than its correlations with all the other constructs (Fornell and Larcker, 1981).

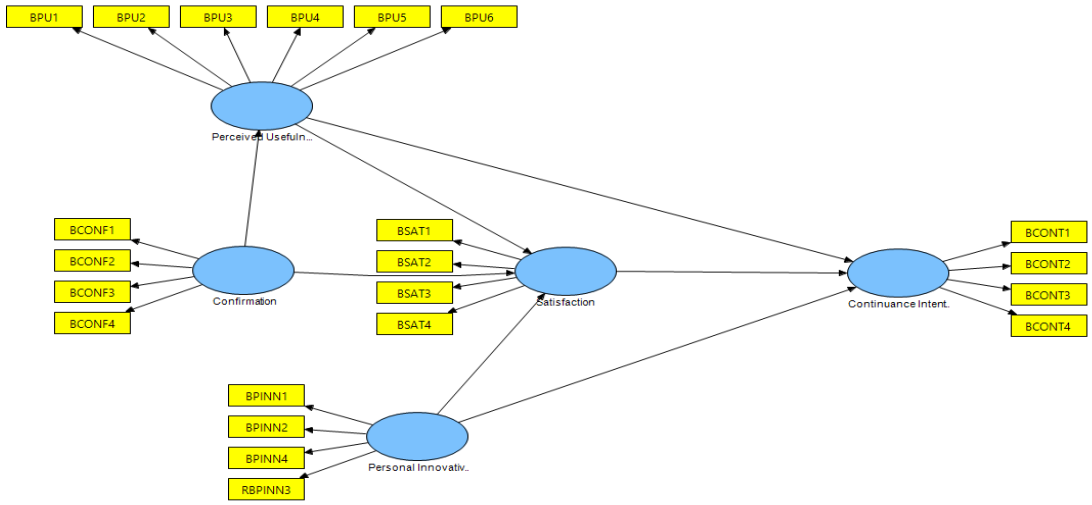

Fig. 4: The measurement model

Table 5: Result of measurement model

		Convergent validity		
Construct	Items	Factor loading	AVE	Composite reliability
Confirmation	BCONF1	0.865	0.647	0.880
	BCONF2	0.805		
	BCONF3	0.757		
	BCONF4	0.786		
Perceived usefulness	BPU1	0.718	0.591	0.896
	BPU2	0.755		
	BPU3	0.805		
	BPU4	0.819		
	BPU5	0.808		
	BPU6	0.702		
Personal innovativeness	BPINN1	0.715	0.501	0.799
	BPINN2	0.663		
	RBPINN3	0.598		
	PINN4	0.834		
Satisfaction	BSAT1	0.879	0.787	0.937
	BSAT2	0.902		
	BSAT3	0.887		
	BSAT4	0.882		
Continuance intention	BCONT1	0.827	0.643	0.878
	BCONT2	0.858		
	BCONT3	0.790		
	BCONT4	0.728		

Table 6: Discriminant validity of constructs

Construct	1	2	3	4	5
Confirmation	0.804	-	-	-	-
Continuance intention	0.499	0.802	-	-	-
Perceived usefulness	0.415	0.429	0.769	-	-
Personal innovveness	0.395	0.420	0.414	0.708	-
Satisfaction	0.469	0.537	0.533	0.349	0.887

Diagonal represents the square root of Average Variance Extracted (AVE) while the other entries represent squared correlations

Structural model: The structural model represents the relationship between constructs or latent variables that were hypothesized in the research model. Figure 5 and Table 7 demonstrate the results of the structural model from the PLS output. Satisfaction was found to be significantly related to continuance intention ($\beta = 0.389$, $p<0.01$), thus supporting H_1 Confirmation was found to be significantly related to satisfaction ($\beta = 0.277$, $p<0.05$) and perceived usefulness ($\beta = 0.415$, $p<0.01$), thus supporting H_2 and H_3 of this study. Perceived usefulness ($\beta = 0.385$, $p<0.01$) was found in this study to be significantly related to satisfaction, hence supporting H_4. As expected, personal innovativeness was found to be significantly related to continuance intention ($\beta = 0.232$, $p<0.05$), thus supporting H_7. Nonetheless, contrary to expectations, there were no significant relationships between perceived usefulness and continuance intention as well as personal innovativeness and satisfaction. Therefore, H_5 and H_6 are not supported.

The goodness of the theoretical model is established by the variance explained (R^2) of the endogenous constructs and the significance of all path estimates (Chin, 2010). Referring to Table 8, the structural model explains 36.0% of the variance in continuance usage intention. A closer look on the findings of the study also reveals that satisfaction is the strongest predictor of continuance usage intention whereas perceived usefulness is the strongest predictor of satisfaction.

The purpose of this study was to test the extended Expectation-Confirmation Model (ECM) among Malaysian mobile commerce consumers by integrating it with personal innovativeness. The study also examined the relationships among confirmation, perceived usefulness, personal innovativeness and satisfaction and the impact of perceived usefulness, personal innovativeness and satisfaction on continuance intention of mobile commerce usage activities. Findings revealed that

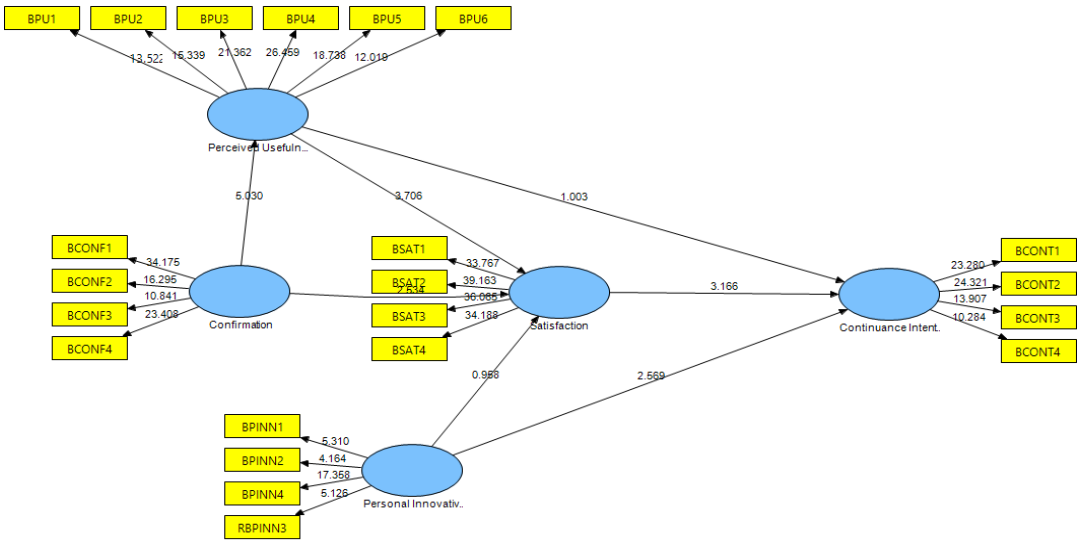

Fig. 5: The structural model

Table 7: Summary of the structural model

Path	Hypotheses	Path coefficient	SE	t-value	Results
Satisfaction→Continuance intention	H_1	0.389	0.123	3.166***	Supported
Confirmation→Satisfaction	H_2	0.277	0.109	2.534**	Supported
Confirmation→Perceived usefulness	H_3	0.415	0.082	5.030***	Supported
Perceived Usefulness→Satisfaction	H_4	0.385	0.104	3.706***	Supported
Perceived Usefulness→Continuance intention	H_5	0.126	0.125	1.003	Not supported
Personal Innovativeness→Satisfaction	H_6	0.080	0.084	0.958	Not supported
Personal innovativeness→Continuance intention	H_7	0.232	0.090	2.569**	Supported

***,**p<0.01, 0.05

Table 8: The variance explained (r^2) of the endogenous constructs

Construct	AVE	R^2
Continuance intention	0.643	0.360
Satisfaction	0.787	0.364
Perceived usefulness	0.591	0.172

personal innovativenessis found to be positively associated with continuance intention. This is in accordance with a study by Hung *et al.* (2007) and Lu (2014). However, it is important to note that personal innovativeness is second to satisfaction in terms of the association of strength with a t-value of 2.569 as compared to 3.166.

Contrary to expectations, personal innovativeness does not significantly influence satisfaction. The finding does not support the previous researches by Hung *et al.* (2007) and Chou and Chen (2009) whereby both of the studies found personal innovativeness to be significantly related with satisfaction. This indicates that the respondents usually pay more attention to their innovativeness when deciding to continue using mobile commerce activities, albeit the fact that consumers' satisfaction does not dynamically change with their innovativeness.

On the other hand, findings revealed that confirmation is positively associated with perceived usefulness and both of the constructs have positive associations with consumers' satisfaction, whereas satisfaction significantly affects continuance intention. The result of this study is similar to the study by Kim *et al.* (2010), Hsiao and Chang (2014) and Chong (2013a) where all the three studies found significant relationships among confirmation, perceived usefulness, satisfaction, and continuance intention in mobile commerce usage.

In addition, the findings of the study are also consistent with previous researches on the other information system continuance usage intention. Santhanamery and Ramayah (2014) found a significant relationship among perceived usefulness, confirmation, satisfaction and continuance intention in a study on electronic tax filing continuance usage intention. Another study also has established a strong positive effect of satisfaction on the continuance usage of electronic learning (Lee, 2010) which further corroborates the findings of this study.

An unanticipated finding was that perceived usefulness does not show any significant relationship with continuance intention. This result mirrors that of the previous study by Kim *et al.* (2014). Nevertheless, it differs from the findings of a great deal of the previous

work in this field (Hong *et al*., 2006; Thong *et al*., 2006; Kim *et al*., 2010; Chen *et al*., 2012; Hsiao and Chang, 2014; Chong, 2013a). The possible reason for this is that 70.5% of the respondents in the study use mobile commerce <15 h in a week which makes it only about 2 h of usage in a day.

CONCLUSION

Being an exploratory study, it is too early to derive the implication of the findings. However, for the sake of academic discussion, the implication can be divided into two; theoretical and practical. Theoretically, this study adds to the growing body of literature that focuses on the post-adoption environment which is continuance intention. It also contributes to the evidence in support for the determinants of continuance intention in mobile commerce usage activities especially in Malaysian context by taking into account another factor which is personal innovativeness. Practically, since satisfaction was found to have a strong strength of association with continuance intention as compared to personal innovativeness, mobile commerce operators and mobile application developers need to recognize the various drivers and possible challenges to increase the level of satisfaction and continuance among mobile commerce users. Issues such as connectivity, connection speed, privacy, security and confidentiality of the data transmitted wirelessly can bring a great sense of satisfaction to the consumers to continuously use mobile commerce. Any dissatisfaction that arises in terms of the abovementioned issues may have an impact on the continuance intention, which may affect the survival and sustainability of mobile commerce industry.

Undoubtedly, based on the findings, personal innovativeness plays an important role in this study and it does matter when dealing with the continuance intention of mobile commerce usage activities. As a result, this study successfully extends the theoretical contribution of the original ECM.Personal innovativeness echoes a general desire to change, to seek novelty and to try new things in a specific domain (Lu, 2014). This simply means that innovative consumers tend to find innovatively designed products and services more attractive (Zolfagharian and Paswan, 2010). Therefore, the providers of mobile commerce ought to attain a better understanding of consumers' personal innovativeness as well asmobile commerce applications should be designed as innovative and interesting as possible in order to keep consumer intentions high.

RECOMMENDATION

The study tested the effect of personal innovativeness, confirmation, perceived usefulness, satisfaction and continuance intention of mobile commerce usage activities among consumers in Malaysia. Regardless of the useful findings of this study, there are several limitations that need to be acknowledged. First, being an exploratory study, the sample size was only limited to 122 respondents. Second, this research used convenience sampling approach. Third, there is a possibility that additional adoption factors have not been included in this study. Finally, the findings cannot be generalized extensively in Malaysia as the scope of the study is only limited to university students. As such, caution needs to be taken when generalizing to the population of the whole country. For that reason, this research can be improved further in the future by increasing the number of sample size, using a random sampling approach, incorporating other relevant variables based on the latest literature suggestions and collecting data from general mobile commerce users.

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