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Research Paper

The Intention of Mobile Banking in Malaysia based on the UTAUT Model and its Empirical Evidence

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Abstract

Rapid advances in the field of wireless technology plus the vast ownership base of cell phones have led banks to invest substantially in developing mobile banking. Though the rate at which mobile banking has been embraced is still significantly lower than expectations. As such, there is an obvious need to initiate research to determine the factors that would have a positive effect on the adoption of mobile banking. To address this issue, present study adopts the Unified Theory of Acceptance and Use of Technology (UTAUT) to recognize these factors and their impact on the adoption of mobile banking. A sample of 400 respondents was used in this study from which it can be empirically concluded that individual intention toward mobile banking is much affected by social influence, performance expectancy and trust, in this particular order of influence. Current study also revealed that gender had a significant moderating effect on performance with regard to the intention toward mobile banking.

Keywords: mobile banking, trust, cost, performance expectancy.

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Introduction

Mobile technologies and services are creating vast business opportunities. They are enabled via the widespread use of different communication technologies and mobile devices (Kim, Choi, & Han, 2009). Currently, by using mobile terminal equipment, consumers are able to conduct a wide range of activities from the transaction of various services, goods and information with a monetary value via wireless network (Quan, Hao, Jianxin, & Per, 2010), generally referred to as m-commerce, and which has been variously defined. Nevertheless, However, in simple terms, , m-commerce is accepted as the utilization of wireless equipment such as cell phones and personal digital assistants, through connection with the Internet in order to communicate or conduct business sans location (Boakye, 2015). World has been changed in many sides such as information technology, which have had impact on the banking industry, so mobile banking is one of the most significant result of that advances. Past study has presented the advantage of mobile banking in regard to financial transactions between banks and their customers. Customers can check their account balance, using credit card transactions by mobile banking as well as provide information on the latest transactions made by customers. However mobile banking still need to be considered as a new technology and relatively unknown to Malaysian. There is a necessity, therefore, to understand the extent of acceptance of mobile banking by customers and to examine the factors affecting intentions to use it for financial transactions

Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology model (UTAUT) has been identified in many studies For the purpose of understanding people's acceptance of new systems; this study has used the UTAUT model as it is among the most widely used in the studies on ICT acceptance modeling. (Venkatesh, Thong, & Xu, 2012). Furthermore, the UTAUT model also takes into consideration four key constructs: Effort expectancy, Performance

Expectancy, Social Factors and Facilitating Conditions, all of which will assist the researcher to determine why people accept mobile banking. UTAUT was established based on theoretical and empirical similarities across eight competing and prominent models in IS adoption research. (Venkatesh, Morris, Davis, & Davis, 2003). Although in the context of Malaysia researches on mobile banking and the factors that influence intention to use it are still at the stage of infancy, this is to be expected as mobile banking technology itself is still in the primary stages of growth and still evolving.

To the marketing personnel, knowing the extent of the impact of trust on the acceptance and the use of m-commerce is crucial if it is to succeed and become a sustainable business. Trust and personal privacy are not new issues in the business world but the fast pace of advances and increasing application of wireless technology are putting these issues in the limelight (Chen, Ross, & Huang, 2008). Hence, it is crucial that these issues in the Malaysian context are understood as they could eventually be the driving force toward accepting and using m-commerce in future by the acceptance of mobile banking service. A good vehicle is necessary in order to be a model of m-commerce acceptance andusagebehaviorto helpmarketersinMalaysiatobesuccessfulintheir marketingefforts.

Literature review

Theoretical Background

In using the UTAUT framework, the argument is that factors pertaining to user effort expectancy, performance

expectancy, social influence, and facilitating conditions all significantly influence user acceptance of IT (Dulle & Minishi-Majanja, 2011). As the model takes into consideration eight varying theories, no consideration is given to whether These four factors are new or different, but are instead adaptations from external factors. previous study by San Martin(2012) mentioned that , performance expectancy is accepted as being the same as perceived usefulness of TAM and the relative advance of IDT . Also, it is acknowledged that effort expectancy and TAM's perceived ease of use and IDT's complexity are similar. the study by zhou (2008) social influence is derived from TPB and TRA's subject norm, while facilitating conditions are associated with TPB's observed behavioral control . Additionally, the UTAUT introduces a number of moderating factors, such as age, experience, gender, and voluntariness.

In order to apply the UTAUT model in various IT application circumstances, such as m-commerce, several modifications and reviews have to be done as emphasized by (Venkatesh et al., 2003). Also, as elaborated by (Van der Heijden, 2004), "various adoption behavioral factors may result from different IS usage". Bearing this in mind, the researchers suggest extending the UTAUT model in combination with two particular features, which are trust and cost. Significantly, the 'voluntariness' factor was eliminated as a moderator because it is only viewed as relevant if technology utilization is crucial (Dulle & Minishi-Majanja, 2011; Venkatesh et al., 2003). It should however be noted that this does not apply in this present research. Similarly, m-commerce concept due to the novel nature of the, 'experience' is viewed as being of less significance and influence in the establishment of m-commerce user acceptance (Xiaolu Cheng, 2010). Furthermore it is recognized that eliminating 'experience' will also reduce the complexity of the framework, In fact, such moderating factors may involve independent variables. Alsip, this paper is in line with the proposal by Dwivedi and Lal (2007), who view gender and age as an independent social variable. As such, Figure 1 presents the modified UTAUT model. The goal of the present study is to ascertain what factors considerably influence people to adopt mobile banking and technology in the context of Malaysia. Hence, two constructs on mobile banking from the literature are considered in the research structure, which are as follows:

Trust

In respect of m-commerce, and mobile banking which is a part of e-commerce, the matter of trust must be considered besides other factors that are related to mobile banking (Luarn & Lin, 2005). As mobile banking is still a new commercial phenomenon, and there are various factors that need to be standardized such as the range of payment schemes, regulations, technical procedures and transaction standards trust becomes fundamentally crucial to ensure earnings and eventual success in m-commerce (Riquelme & Rios, 2010). In line with the above, it is accepted (Dasgupta, Paul, & Fuloria, 2011) that a trust component should be included in m- commerce studies, especially with reference to m-commerce service providers. In any case, trust should also be embedded in concepts such as ease of use and perceived usefulness (Min, Ji, & Qu, 2008). In addition, because concerns about security and privacy are major barriers to internet use/commerce, there will be reluctance among consumers to provide personal data without trust (Amin, 2009; Gefen, Benbasat, & Pavlou, 2008). This study also emphasizes that perceived trust influences intention to adopt mobile banking and directly affects behavioral intentions. This research concurs with the definition of Wei et al. (2009b). Trust in the context of mobile banking is 'the extent to which an individual believes that using m-commerce is secure and has no privacy threats' (p. 376).

H1: Trust significantly influences intention toward mobile banking.

Cost

In the context of information systems usage, financial as well as hardware/software resources are crucial considerations among users (Wu & Wang, 2005). Different from other m-commerce factors, cost is a fundamentally crucial aspect for consumers when considering whether or not to buy and use mobile banking (Hong, Thong, Moon, & Tam, 2008). Similarly, (Sathye, 1999) emphasizes the importance of financial commitment associated with the adoption of innovation, and states that cost is one of the major factors that hinder users in Australia and Singapore from accepting internet banking. (Anil, Ting, Moe, & Jonathan, 2003). On account of this,, Wu et al. (2005) show that, in Malaysia, behavioral intention is very much influenced by cost compared to other factors. Several researchers consider cost to be one of the most serious obstacles to adoption of technology from developing countries are the adoption of: data services and this includes expense of transactions, billing errors and lack of visibility of transaction costs (Ramburn & Van Belle, 2011), 3G MMS (Indrawati & Raman, 2010).

In addition, when cost is considered (Carlsson, Walden, & Bouwman, 2006) it should be noted that it is a basic consideration with users accounting for the application of 3G (third generation) services, and do not highly prioritize privacy and security concerns over cost as evidenced among users in Finland ((Wei, Marthandan, Chong, Ooi, & Arumugam, 2009a). Moreover, it has been realized that cost can have a significant negative effect behavioral intention to use (Chong, Chan, & Ooi, 2011). (Yu, 2011) also discovered that cost had a significant influence on the intention to use mobile banking. As such, H2: Cost significantly influences intention toward mobile banking is accepted.

Performance Expectancy

Venkatesh (Venkatesh et al., 2003) defined performance expectancy as the strongest predictor of behavioral intention to use several technologies in both voluntary and involuntary settings. Venkatesh (Venkatesh et al., 2003) clarified that Performance expectancy involves the extent to which a potential user believes that adopting a particular system will help him or her to benefit from gains in job performance Strengthening this belief will increase the behavioral intention to adopt and use mobile banking service. In UTAUT, performance expectance is motivated by a perception of usefulness (TAM/TAM2), and relative advantage.

In light of all the above, present study suggests the following hypothesis:

H3: Performance expectance has a significant influence on intention toward mobile banking.

Effort Expectancy

Effort expectancy is perceived as the level of convenience linked to the utilization of the information system. EE has a close relation with the ease of use in TAM. When EE is promoted, it results in enhanced performance and should positively and directly affect performance expectancy (PE) and culminate in an intention to use. Based on other competitor models, Venkatesh et al. (2003) encapsulated the notion of perceived ease-of-use (TAM/TAM2), complexity (MPCU), and easy-of-use (IDT) to describe EE as the level of convenience in using technology. Earlier experimental research on adopting mobile banking (Dasgupta et al., 2011; Luarn & Lin, 2005) was supportive of the perceived ease-of-use as an influential factor in persuading people to embrace the concept of mobile banking. On the basis of UTAUT, Park et al. (Park, Yang, & Lehto, 2007) and Lu et al. (Lu, Yu, & Liu, 2009) used three constructs of PE, RE and social influence to investigate the factors that motivate an individual to embrace the notion of mobile technology and data service, respectively. These two investigations confirmed the belief that EE had a significant impact on people's intention to accept and use mobile banking technology or service. Consequently, rooted in UTAUT, this study proposed the hypothesis that:

H4: Effort expectation has a significantly influence on intention to use mobile banking.

Social influence

Earlier research has suggested that social influence is a highly effective predictor of behavioral intention to adopt a particular IS (Venkatesh & Morris, 2000). Social influence has been incorporated into this research based on rationale that a learner's' decision is affected by the influence of others such as fellow students or the instructor (Venkatesh et al., 2012). Social influence is defined as the degree to which an individual perceives that important others believe he or she should use the new system. Moreover, social influence is also believed to significantly affect an individual's intention to use mobile banking, as pointed out by (Khalifa & Shen K, 2008)

H5: Social influence significantly influences intention toward mobile banking.

Moderator effects – Gender

One of the tenets of UTAUT theory is that gender significantly moderates the acceptance of information technology. In IS studies, gender differences constitute a significant research direction. UTAUT theory posits that performance expectancy has an impact on intention and is gender moderated. The impact of PE on BI has been revealed to be greater for men than for women when it comes to

accepting IS (Venkatesh et al., 2003) as has been indicated by previous research which discovered that men had a stronger feeling about the perceived usefulness of mobile services compared to women (Nysveen, Pedersen, & Thorbjornsen, 2005). This could be due to the fact that men are more task-oriented than women. It is also the belief of this researcher that there is the existence of a moderating effect in accepting Mobile banking, which leads to the following hypothesis:

Hypothesis 6.1: Gender has a moderating influence on performance expectancy on intention toward Mobile banking.

UTAUT points out that the influence of EE on intention is moderated by gender. The effect of EE on BI has been found to be stronger for female than male in the acceptance of information system (Venkatesh et al., 2003). This paper believes in the existence of the moderating effect in accepting mobile banking. So the following hypotheses can be obtained.

Hypothesis 6.2: Gender moderates the influence of EE on intention toward Mobile banking.

UTAUT emphasizes that the impact of social influence on intention is gender-moderated. The fact that social influence affects intention has been revealed to be greater for women than for men in accepting IS (Venkatesh et al., 2003). This researcher is of the belief that in the existence of this moderating effect in the decision to accept mobile banking and the following hypothesis is arrived at:

Hypothesis 6.3: Gender has a moderating effect on social influence regarding intention toward Mobile banking.

In addition, several experimental studies have discovered that male and female respondents are statistically different in the context of mobile service/banking. For instance, women appear to view online shopping as more risky than men do (Garbarino & Strahilevitz, 2004). peer influence has a greater impact on women than on men in relation to mobile services (Nysveen et al., 2005); there is a greater likelihood of men using mobile service than women (Laukkanen & Pasanen, 2008) and men show greater concern about cost of Internet access and service fees compared to women when it comes to the matter of using mobile banking services (Cruz, Gallego, & Laukkanen, 2010).

Hypothesis 6.4: Gender moderates the influence of trust on intention toward mobile banking.

Hypothesis 6.5: Gender moderates the influence of cost on intention toward mobile banking.

This current research does not include age experience and voluntariness as moderators but only gender as a moderator to determine if it moderates the impact of PE, EE, social influence, trust and cost on behavioral intention toward mobile banking as shown in Figure 1.

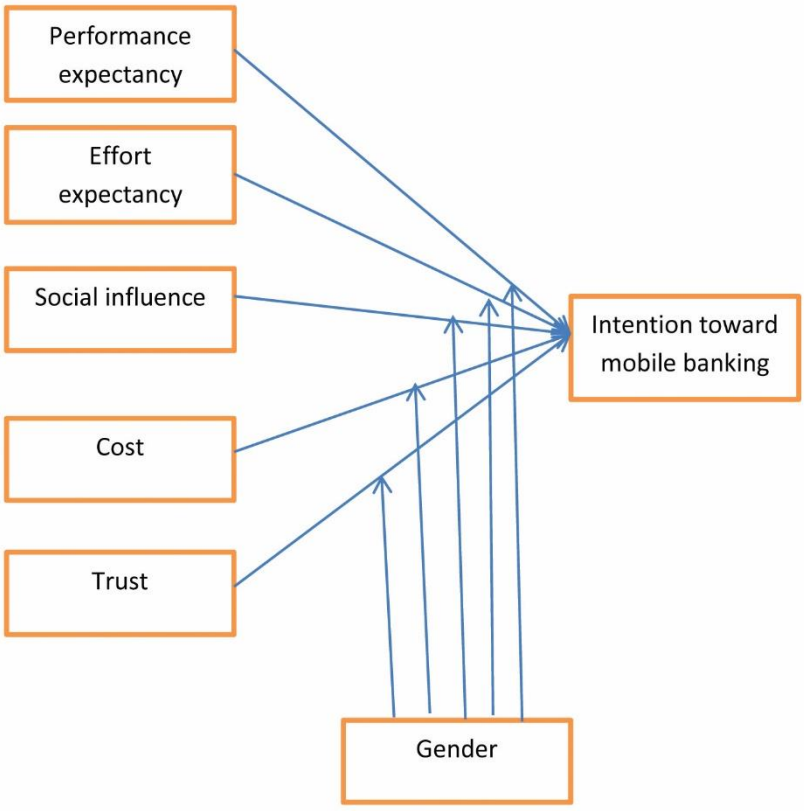

Figure 1: research model Methodology

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Method of data collection has been used by questionnaire to gather information directly from students enrolled in public and private universities located in the Klang Valley, Selangor, Malaysia. A total of 400 questionnaires were completed. The sampling design for this population was cluster sampling. The researcher first identified clusters (public and private universities). In order to collect the data, a survey using self-administered questionnaire was conducted. A close-ended questionnaire with 5-point Likert scale was chosen.

Results

Using the two-step approach of Anderson and Gerbing (1988), the measurement model was examined to determine how reliable and valid it was. This s followed by an examination of the structural model to determine the research hypotheses and model fitness.

Measurement model

Overall, the measurement model provided an adequate fit (x 2/df = 1.423, CFI =0.987, TLI = 0.932, GFI = 0.943, RMSEA = 0.032). To evaluate the convergent validity, average variance extracted (AVE), the standard factor loadings, and composite reliabilities were studied. Table 1 show that all factor loadings exceeded 0.7 and critical ratio gave an indication that all loadings were significant at 0.001. AVEs and CRs were larger than 0.5 and 0.7, respectively. As such, the scale had good convergent validity (Bagozzi & Yi, 1988; Gefen, 2000). Additionally, all a-values exceeded 0.7, indicating excellent fit (Nunnally, 1978). discriminant validity was conducted to the approach taken by Fornell and Larcker (1981), the square root of the AVE exceed the correlations of two composite constructs. As shown in Table 2, the square roots of the AVE are invariably in excess of the off-diagonal correlations.

Table 1: Reliability of instrument

Construct	Items	Composite Reliability	AVE
Performance expectancy	4	0.85	0.61
Effort expectancy	5	0.91	0.74
Social influence	5	0.84	0.60
Cost	3	0.76	0.59
Trust	6	0.85	0.62
Intention	7	0.93	0.60

Table 2: correlation of construct

Construct	Effort Expectancy	Social influence	Cost	Trust	Performance	Intention
Effort Expectancy	1					
Social influence	.406	1				
Cost	.386	.435	1			
Trust	.050	.437	.243	1		
Performance expectancy	.137	.455	.337	.576	1	
intention	.591	.040	.631	.106	.457	1

Structural model

Structural equation modeling (SEM) techniques were used in the analysis of the causality among the antecedent factors and consumers' intention to use mobile banking. The results in Table 3 show the acceptability of the data set (Schumacker & Lomax, 2010). As indicated in Figure 2, performance expectancy (B = 0.71, p < 0.001) and effort expectancy (B = - 0.80, p < 0.001) influence the behavioral intention toward mobile banking and thus technologies, that support H1 and H2, respectively. H3, predicted the positive impact of social influence on the behavioral intention to mobile service, was also supported (B= 0.62, p < 0.001). Furthermore, according to expectations, H4, suggested that trust had an insignificant role in the

prediction of intention to use mobile service technologies in the presence of the other variables, (B= 0.64, p < 0.001) The most unexpected finding was that the apparent cost of using mobile banking services, which, hitherto was considered (Commission, 2007) to be the main reason why people in Malaysia hesitate to use technologies, was not found to be significantly related with the intention to accept mobile banking in this study. Nonetheless, our finding is consistent with (Ong , Poong, & Ng, 2008). However, this might have been caused by the fact that the respondents taking part in this study were university students, who depend on either their parents or guarantors to survive, while they did not bear the burden of what they spent. Furthermore, strengthened by the affirmative connotation between image and the intention of mobile banking acceptance (Ong et al., 2008), financial status might be linked with positions and subsequent intention to use mobile banking technologies. For example, students might feel that using costly technologies would elevate their positions or the positions of their parents or sponsors, and, hence, create a unique image for themselves by their high intentions to use such technologies.

Table 3: Fit indices

Model	CMIN/DF	NFI	IFI	TLI	CFI	RMSEA	GFI
Default model	1.208	.895	.926	.955	.950	.034	.935

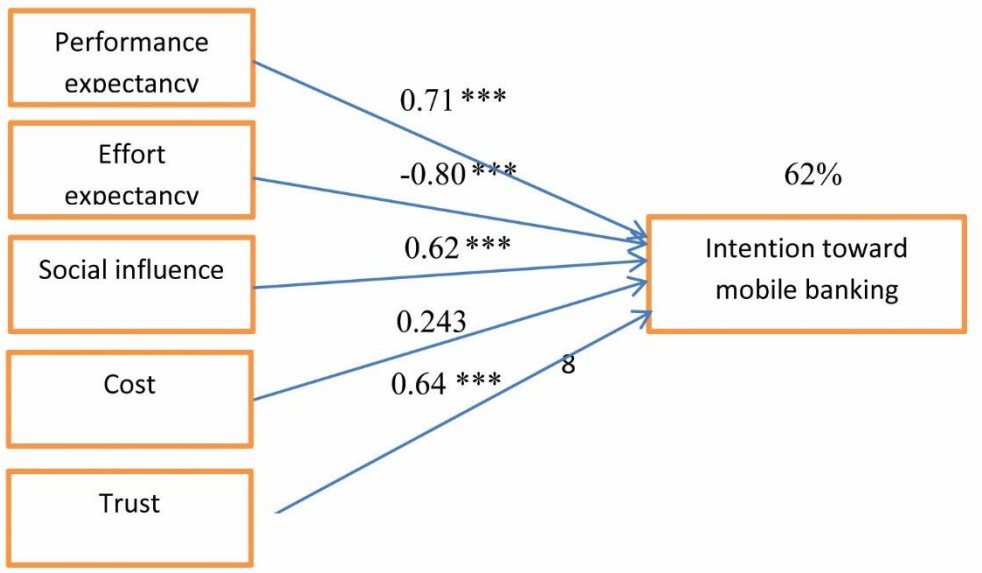

Figure 2: Structural model results

The researchers conducted a multi-group analysis to confirm the moderating effect of gender among the underlying relationships in the model. First, the model was estimated on the basis of the two sub-groups (male, female) to prove the model fit for any group. A multi-group analysis was then done by relating the two gender groups. A constrained model was compared, not allowing the structural limits to vary across the two sub-groups of subjects in the unconstrained model and across the two sub-groups; the moderation analysis was processed, after which the model fit indices ($\chi 2$ (CMIN), *df* and *p)* were compared between the unconstrained and measurement residuals. Both models were found to have significant p-values ($p < .05$). However, the unconstrained residual had a better $\chi 2$ value, which was smaller than the measurement residuals model in the study. Hence, we proceeded to examine the significance of the $\chi 2$ difference and made the model comparisons. Having found significant differences ($p < \alpha$) in the

relationships we concluded that gender has some form of moderating effect on the overall model $\chi 2$. The results are presented in Table 4 .Overall, gender has exhibited significant interactions with trust but no other predictor latent variables, indicating that both female and male students have approximately the same features in terms of their familiarity in using mobile banking (Venkatesh et al., 2003).

Table 4: Moderation Test of Gender on Relationship between intention and constructs variables

Construct	B	Beta	P	CR Differences
Social influence Female Male	.044 .080	.031 .090	*** ***	2.561 2.372
Performance Female Male	.451 .653	.765 .778	*** .215	17.835 14.364
Effort Female Male	-.062 -.083	-.094 -.131	*** ***	-4.674 -3.113
Cost Female Male	-.264 -.108	-.017 -.015	.578 .489	-.436 -.591
Trust Female Male	.441 .453	.665 .678	*** ***	-.642 -.675

Discussion

The aim of this study is to analyze the influential factors regarding users' decision to accept mobile banking technologies in an integrated manner: the study discovers that an individual's PE, EE, trust, and social influence are predictors of his/her intention toward mobile service.

In a comparison of path coefficients of antecedents of the behavioral intention toward mobile banking, PE has become the strongest predictor compared to other belief factors. This is in support of earlier UTAUT studies that have confirmed PE as the main determinant of an individual's use of a technology while EE, trust, and social influence aresupporting determinants (Davis, Bagozzi, &Warshaw, 1989; Venkateshetal.,2003).

Additionally, social influence has been found to have the second strongest impact on behavioral intention. Primarily because the respondents are aged from 20 to 34 years, they are considered a youthful group that is particularly vulnerable to social pressure and very much attracted to novel trends and are usually caught up in the rapid lifestyle and fashion shifts (Lu, Chun-Sheng, & Yao, 2003). As such exposure to media and peer pressure play a very significant role in influencing them to use technology. We believe that most of the respondents will be influenced by their important relationships especially with family and friends and would be likely to embrace new technology if these important people around them do so.

In light of such a situation, the providers of mobile banking should pay close attention to the factor of social influence in their efforts to market their services., The mobile banking industry should also use the existence of confirmed adopters for their positive opinions and word-of-mouth testimonials in influencing others to adopt and use mobile banking services (Wiedemann, Haunstetter, & Pousttchi, 2008).

This study found that Performance Expectancy positively and significantly affects intention Toward Use of Technology. This indicates that practitioners place high importance on the performance of mobile devices both on and off their jobs. For instance, using mobile banking service can be more convenient and time-saving compared to traditional banking services.

Table 4 shows how gender moderates the five constructs toward behavioral intention, From the table it can be seen that gender has no significant moderating effect on EE, social influence, cost, and trust toward behavioral intention but has a significant moderating effect on PE toward behavioral intention. The details of the statistics indicate that males see more PE than females in using mobile banking, which supports the result of Nysveen et al. (2005).

In comparison with other competitors, the UTAUT model has been proven to be superior (Venkatesh et al., 2003; Venkatesh et al., 2012) According to Venkatesh and Zhang (2010), UTAUT has been in

greatest demand in studies that attempted to examine and enhance the generalizability and validity of UTAUT in a range of different technologies. As a result, the first hypothetical contribution of this study is to illustrate the validity and generalizability of UTAUT in mobile banking intention in Malaysia.

By adding one trust-based construct and cost to the UTAUT, this study noted that social influence, PE, and trust, in this order of influence were three salient factors in the prediction of behavioral intention toward mobile banking.

In practical terms, this study provides significant pragmatic implications to industry management, IT and marketing departments tasked with the responsibility to implement and deploy mobile services.

This is in line with previous findings that trust significantly affects intention. Furthermore, structural assurance is an influential factor in the trust in mobile banking, as it ensures and protects information, confidential transactions and makes services available – all of which are crucial in reducing risks to the provider's reputation and encouragingacceptance.

Thisstudyhasshownthattheuseofmobilebankingisa very individualized service that implies high user concern about confidentiality and security. As such, those who make decision and financial bodies need to prioritize the establishment of trust in the minds of their customers from the onset. Companies involved in the marketing and promotion activities of mobile banking must highlight the security measures in place to avoid losses both financially and information-wise. Strategically, the development of an initiative in a mobile service is to encourage its adoption, and therefore it is crucial that the user's behavioral intention is translated into the adoption, use and loyalty to the service.

Also, telecommunication enterprises can promote new products to potential consumers. With regard to Performance Expectancy, telecommunication enterprises can explain the convenience of mobile phone service in daily life to let users know how they can benefit from it.

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