Kasetsart Journal of Social Sciences 40 (2019) 349–358

Kasetsart Journal of Social Sciences

journal homepage: http://kjss.kasetsart.org

Determinants affecting mobile banking adoption by generation Y based on the Unified Theory of Acceptance and Use of Technology Model modified by the Technology Acceptance Model concept

Waranpong Boonsiritomachai [a, *], Krittipat Pitchayadejanant [b]

[a] *Department of Management, Faculty of Business Administration, Kasetsart University, Bangkok 10900, Thailand*
[b] *International College, Burapha University, Chonburi 20131, Thailand*

Article Info

Article history:
Received 26 April 2017
Revised 30 August 2017
Accepted 19 October 2017
Available online 7 November 2017

Keywords:
generation Y,
mobile banking,
structural equation model,
Technology Acceptance Model,
Unified Theory of Acceptance and Use of Technology

Abstract

This study was undertaken to explore the determinants affecting behavioral intention to adopt mobile banking among generation Y. Based on the theoretical model incorporating the Unified Theory of Acceptance and Use of Technology (UTAUT) and the Technology Acceptance Model (TAM), in this study, a revised and extended model was proposed in order to better explain mobile banking adoption. Moreover, the aim was to determine the mediating effect of hedonic motivation on independent mobile banking adoption. The proposed model was empirically tested using survey data provided by 480 respondents and was further analyzed using a structural Equation model (SEM). The analysis results indicated that the revised model had a good fit in the context of mobile banking adoption by generation Y. In addition, hedonic motivation of mobile banking users was identified as the most important factor motivating customers to adopt mobile banking, whereas mobile banking system security had a negative relationship with hedonic motivation. The results can be used by banking institutions to develop strategies and to improve their services in order to increase the adoption of mobile banking among generation Y.

Introduction

As the banking industry becomes increasingly competitive, each bank must develop proprietary services and products to serve existing customer needs and attract new clients. Banks should bring the greatest utility and convenience to their customers and thus need to focus on customer satisfaction and provide incentives to influence customer loyalty. The services that meet customer requirements should be simple, compatible, and personalized with complementary services. In addition, banks should have a digital platform with fast and secure access (Shaikh & Karjaluoto, 2015).

In the current digital age, Financial Technology (FinTech) plays an important role in helping banks gain new customers and scale their business operations. Banks and other financial services companies found that FinTech has brought innovations into the financial market (Gulamhuseinwala, Bull, & Lewis, 2015) with mobile technologies as an essential platform supporting FinTech. A wide range of new mobile technologies have been developed specifically for financial services and the banking industry. The number of mobile payment transactions worldwide has increased by approximately 58.33 percent

* Corresponding author.
E-mail address: waranpong@gmail.com (W. Boonsiritomachai).
Peer review under responsibility of Kasetsart University.

https://doi.org/10.1016/j.kjss.2017.10.005
2452-3151/

from 2014 to 2015 (Dapp, Slomka, & Hoffmann, 2015). Hence, banks should integrate mobile payment systems in order to eliminate the need for customers to enter their personal payment details for each transaction.

Thailand's payment environment, while challenging, supports the use of electronic devices such as the mobile phone. According to the mobile banking usage statistics for Thailand published by the Bank of Thailand, the number of customer transactions conducted via mobile banking services has rapidly increased in the last five years (Trairatvorakul, 2014). Takorn Tantasith, the Secretary-General of the National Broadcasting and Telecommunications Commission (NBTC) Thailand, noted that the latest estimates indicate approximately 93.7 million registered mobile phone users, and yet only 20 percent of bank customers presently use mobile banking services. This shows a low uptake of mobile banking services despite high mobile phone use by the Thai population. The main barrier to using mobile banking in Thailand is the preference for cash payment, followed by security concerns, and finally consumer behavior (Tavilla, 2015).

Extensive review of extant research on technology adoption reveals that many authors have previously attempted to combine two or more theories to explore customer adoption of information technology (Arenas-Gaitan, Peral, & Jeronimo, 2015; Chan & Lu, 2004; Martins, Oliveira, & Popovic, 2014; Oliveira, Faria, Thomas, & Popovic, 2014). In the current research, the Technology Acceptance Model (TAM) and the second-generation theoretical model known as Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) are used to empirically study mobile banking adoption.

According to UTAUT2, hedonic motivation is measured by the enjoyment and fun associated with using technology (Brown & Venkatesh, 2005) which helps to a trigger positive attitude among users (Poong, Yamaguchi, & Takada, 2017), as is also implied by TAM (Salimon, Yusoff, & Mohd Mokhtar, 2017). In modeling, hedonic motivation is treated as the independent variable and has been found to be an important driver affecting behavioral intention (Venkatesh, Thong, & Xu, 2012). Venkatesh and colleagues further argued that the role of attitude in explaining behavioral intention is very limited and is at best a mediator in the relationship between salient beliefs and the adoption behavior or intention. However, in extant research, there is no consensus on the mediating role of attitude (Kim, Chun, & Song, 2009). Hence, in this study, TAM and UTAUT2 perspectives were integrated in an attempt to explain the mediating role of hedonic motivation as an attitude.

Furthermore, customer age is likely to play a role in the relevance of the factors influencing mobile banking adoption. Apparently, in the Unified Theory of Acceptance and Use of Technology (UTAUT), age is a crucial variable (Venkatesh, Morris, Davis, & Davis, 2003). Generation Y is unique, as it is tech-savvy and most young individuals are willing to adopt new technology (Freestone & Mitchell, 2004; Goi & Ng, 2011). Moreover, members of this age group usually find and consume information through their mobile phones. They are able to select a suitable technology and learn how to use it, and thus may find conducting financial transactions online easier compared to previous generations. Therefore, mobile banking is appropriate to support their needs, as it provides convenience in executing banking transactions (Goi & Ng, 2011).

From the purely academic perspective, it is important to note that the variables employed in the present study do not fully replicate those incorporated in UTAUT and UTAUT2. Specifically, one of the two variables, security (SEC), was incorporated in the original UTAUT, while the second variable, self-efficacy (SE), is unique to the present study. In addition, as a part of the present research, the effect of hedonic motivation is examined in the case where it serves as a mediator, in line with the TAM model (Davis, 1989), as well as when it is incorporated in the model as an independent variable, as was done in the UTAUT2 model (Venkatesh et al., 2012). Finally, the ability to explain behavioral intention in mobile banking adoption between the two models is also discussed.

From a practical perspective, mobile banking developers should be aware that the motivation behind this study was to increase the number of customers using the mobile banking system, while focusing specifically on generation Y. In addition, the aim was to assist the financial institutions in the design of an effective mobile banking system to respond to the needs of prospective customers. The impetus of the study is grounded in the social psychology theory, based on technology acceptance in adopting mobile banking by generation Y in Bangkok. The study findings can therefore elucidate how likely customers would adopt mobile banking.

This paper is presented in four sections. The first section is designated for a review of pertinent literature related to technology acceptance. The research methodology of the study is presented in section two, along with the measurement instruments and the data collection procedure. The third section describes the structural equation and mediation analyses, and the paper concludes with the study implications.

Literature Review

Numerous theoretical models describing technology acceptance have been developed in the field of psychology and sociology, such as the Innovation Diffusion Theory (IDT) (Rogers, 1983), Social Cognitive Theory (SCT) (Bandura, 1986), Theory of Reasoned Action (TRA) (Fishbein, 1979), Theory of Planned Behavior (TPB) (Ajzen, 1991), Technology Acceptance Model (TAM), and Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003). Among these theoretical models, TAM has been the most widely used and cited by many researchers, with more than 7,000 citations, as reported by Google Scholar citations in 2010 (Bradley, 2012). TAM popularity is likely due to three aspects. First, TAM is designed to accurately explain Information Systems or Information Technology adoption within various organizations, cultural settings, technology contexts, and different expertise levels. Second, TAM has strong theoretical literacy and high validity measurement scales. Third, TAM has been a subject of many empirical studies, the findings of which support its overall explanatory power (Yousafzai, Foxall, & Pallister, 2010).

TAM can be applied to determine the behavioral intention with attitude towards technology usage. Two surrogates of attitude towards usage are perceived ease of use and perceived usefulness of an information system (Davis, 1989). However, the limitations of TAM, related to extensibility and explanation power, have been noted (Benbasat & Barki, 2007). Many researchers have thus recommended that TAM be extended to incorporate additional variables and thus strengthen the model (Legris, Ingham, & Collerette, 2003; Sun, Cao, & You, 2010). Some researchers are also of view that the TAM constructs do not provide sufficient implications to practitioners (Benbasat & Zmud, 1999). Moreover, available evidence indicates that it fails to capture the constraining influence and personal control factors possibly affecting adoption behaviors, such as unconscious habits and the period of adoption (Mathieson & Keil, 1998; Taylor & Todd, 1995). Additionally, TAM has been criticized for overlooking the significance of social issues, particularly subjective norms pertaining to perceived social pressure whether or not to engage in a particular behavior (Ajzen, 1991). Moreover, TAM was originally designed to apply to computer usage behavior (Davis, Bagozzi, & Warshaw, 1989). Given these limitations, some researchers argue that TAM is overly generic and thus cannot provide a realistic understanding of the adoption of advanced mobile services and technologies (Bouwman & Van De Wijngaert, 2009; Salimon et al., 2017).

Another theoretical model, which has been used in many recent research studies, is UTAUT, proposed by Venkatesh et al. (2003). This theoretical model integrates elements across eight models of IT acceptance—the TRA, TAM, TPB, IDT, SCT motivational model (MM), combined TAM and TPB (C-TAM-TPB), and model of personal computer utilization (MPCU). Originally, UTAUT focused on seven independent constructs, namely performance expectancy, effort expectancy, social influence, facilitating conditions, computer self-efficacy, anxiety, and attitude toward using technology (Venkatesh et al., 2003). However, only four constructs have been found to be significant, namely performance expectancy, effort expectancy, social influence, and facilitating conditions that explain the behavioral intention and actual use. These have since been employed in many research studies (Curtis et al., 2010; Ghalandari, 2012; Marchewka, Liu, & Kostiwa, 2007). Although UTAUT incorporates a greater number of constructs, it suffers from significant constraints, including lack of parsimony. As UTAUT unifies more factors and consolidates functions of the Technology Acceptance Model with the constructs of other popular models in IT adoption research, it is highly complex, making its applicability difficult to assess (Bagozzi, 2007). Several researchers also argue that UTAUT was developed to explore the mandatory use of technology; therefore, its ability to explain the voluntary use of technology, such as mobile applications, mobile banking, and mobile games, is limited (Van der Haijden, 2006). Overcoming these shortcomings is the aim of this work.

Recently, Venkatesh et al. (2012) proposed an extension of the UTAUT model (UTAUT2) by introducing hedonic motivation, price value, and habit as exogenous variables to render the model more suitable in the context of consumer technology use, which is the focus of the present research project. Because UTAUT2 is mainly based on UTAUT, it is still subject to some of the original limitations. Thus, in order to apply UTAUT2 in certain special IT applications, Venkatesh et al. (2012) suggested that further modifications and revisions be made.

Due to the aforementioned limitations of TAM and UTAUT2, in this study, these two theories were integrated. This strategy was deemed beneficial, as TAM provides an appropriate measure to evaluate the impact of external variables on users' attitudes and intentions to use new technologies like mobile banking in this research. On the other hand, UTAUT2 has superior explanation power relative to other competing models due to extensive inclusion of constructs, such as social influence, facilitating condition, and hedonic motivation. This model was recently applied to empirically test user acceptance of technology (Alalwan, Dwivedi, & Rana, 2017; Slade, Williams, & Dwivedi, 2014). Therefore, the constructs included in UTAUT2 can be used in this study in exploring the direct determinants of mobile banking usage intention, which can in turn deepen our understanding of factors that contribute to the diffusion of mobile banking. The variables used in this research are described in detail in the subsequent sections.

Hedonic Motivation (HEDONIC)

According to the TAM, attitude construct measures the feeling of favorableness or unfavorableness towards using the technology (Davis, 1989). However, attitude usually refers to the degree of preference or enjoyment that is derived from the usage of a product or information technology service such as mobile banking (Wang & Scheepers, 2012). In Korea, attitude is the most significant factor for predicting the behavioral intention in adopting mobile technologies and services (Ho Cheong & Park, 2005) and mobile banking services (Shaikh & Karjaluoto, 2015). Perceived enjoyment has a strong effect on user satisfaction and has a further effect on mobile internet usage (Zhou, 2011).

Goi and Ng (2011) found that young customers using mobile phones have a positive perception of using mobile commerce applications. Kumar and Lim (2008) compared the willingness to adopt mobile service of baby boomers and generation Y. They found that being a member of a particular generation could influence willingness to use mobile technology. According to their findings, emotions, such as enjoyment and sense of fun, influence the perceived level of satisfaction with mobile services (Kumar & Lim, 2008). Consequently, psychological benefits, such as enjoyment, are an essential determinant influencing mobile banking adoption. Therefore, in this study, it is posited that hedonic motivation affects behavioral intention to adopt mobile banking.

In UTAUT2, hedonic motivation is treated as an independent variable without a mediation effect (Venkatesh et al., 2012). However, in the original TAM model, attitude exerts a mediating effect between perceived usefulness and behavioral intention, as well as between perceived ease of use and behavioral intention. These two determinants are referred to as performance expectancy and effort

expectancy, respectively, in the UTAUT model. The hedonic motivation is the independent variable and was found to be an important driver affecting behavioral intention (Venkatesh et al., 2012). In addition, attitude can be the best mediator in the relationship between salient beliefs and the adoption behavior or intention (Kim et al., 2009; Venkatesh et al., 2003). As a result, in the present study, models in which hedonic motivation is included as a mediator or an independent variable are examined and compared.

Hypothesis 1. Hedonic motivation impacts on behavioral intention in mobile banking adoption.

Performance Expectancy (PE)

Performance expectancy (PE) is the degree to which an individual believes that using mobile banking will increase his/her job performance (Venkatesh et al., 2012). PE indicates that users perceive use of mobile applications as beneficial to their performance. In previous research, PE was shown to affect behavioral intention in mobile commerce (AbuShanab & Pearson, 2007; Sun et al., 2010), mobile service (Zarmpou, Saprikis, Vlachopoulou, & Singh, 2010), and mobile banking service (Shaikh & Karjaluoto, 2015) contexts. Moreover, mobile commerce adoption by Singapore consumers has been influenced by performance expectancy, attitude, and innovativeness (Yang, 2005). Mobile payment service adoption is influenced by performance expectancy, perceived security, and mobile payment knowledge (Peng, Xiong, & Yang, 2012).

Hypothesis 2A. Performance expectancy impacts on behavioral intention in mobile banking adoption.

Hypothesis 2B. Performance expectancy impacts on hedonic motivation in using mobile banking.

Effort Expectancy (EE)

Effort expectancy is defined as the perceived degree of ease associated with an individual's use of technology (Venkatesh et al., 2012). Ease of use is significantly related with behavioral intention because Internet banking or mobile banking is new to the customers. Hence, banks should strive to ensure that transactions could be conducted via mobile phones with ease (Gu, Lee, & Suh, 2009). However, extant research indicates that the ease of using mobile banking or Internet banking is not significantly affected by behavioral intention (Oliveira et al., 2014; Zhou, 2011). In the present study, effort expectancy is examined in order to elucidate its effect on behavioral intention.

Hypothesis 3A. Effort expectancy impacts on behavioral intention in mobile banking adoption.

Hypothesis 3B. Effort expectancy impacts on hedonic motivation in using mobile banking.

Social Influence (SI)

Social influence is the degree to which an individual perceives that important others believe he or she should use the new system (Venkatesh et al., 2003). It is similar to subjective norms that are captured by TAM, or social factors—a construct featured in MPCU (Yu, 2012). Gu et al. (2009) found that social influence has no significant effect on behavioral intention pertaining to mobile application usage. Among university students, who are members of generation Y, social influence does not significantly influence mobile banking adoption (Govender & Sihlali, 2014). In the present study, a social influence effect on intention to adopt mobile banking is examined, as hypothesized below.

Hypothesis 4A. Social influence impacts on behavioral intention in mobile banking adoption.

Hypothesis 4B. Social influence impacts on hedonic motivation in using mobile banking.

Facilitating Condition (FC)

Facilitating condition (FC) is the infrastructure supporting use of technology (Venkatesh et al., 2012). This construct is similar to perceived behavioral control in the Theory of Planned Behavior (TPB). According to the available evidence, FC does not significantly affect the adoption of Internet banking (AbuShanab & Pearson, 2007; Tan, Lau, & Young, 2016). However, in this research, facilitating condition pertains specifically to applications supporting mobile banking usage. For instance, the goal is to establish if the application works properly, is continuously updated, and is easy to use. Thus, it is hypothesized that better facilitating conditions will result in greater mobile banking usage.

Hypothesis 5A. Facilitating condition impacts on behavioral intention in mobile banking adoption.

Hypothesis 5B. Facilitating condition impacts on hedonic motivation in using mobile banking.

Security (SEC)

Security, in the context of this research, relates to the security system banks are providing through mobile banking applications. The security system was found to be the necessary factor motivating Chinese customers to adopt mobile banking (Laforet & Li, 2005). It is an imperative concern and is significant when making e-payments (Tavilla, 2015). In Thailand, security is the most critical issue in customers' intent to adopt mobile banking (Rotchanakitumnuai & Speece, 2003). Mobile platforms and services should be safe and reliable, while security should also extend to mobile channels and mobile network operation. Thus, commercial banks should invest in a comprehensive security system to motivate their clients' mobile banking adoption. According to Lee (2009), security risk is inversely related with Internet banking adoption. Currently, Thai commercial banks provide the security system to their customers by sending an SMS, sending confirmation evidence, requesting a transaction password, and asking for a one-time password from the user (Viriyarungsarit, 2017).

Hypothesis 6A. Security system impacts on behavioral intention in mobile banking adoption.

Hypothesis 6B. Security system impacts on hedonic motivation in using mobile banking.

Self-Efficacy (SE)

Self-efficacy is a construct captured in the extended TAM. The construct measures the ability to use technology to accomplish a task (Venkatesh et al., 2003). In this research, self-efficacy is the measurement of an individual's assessment of his/her ability to use a mobile banking application. Self-efficacy affects perceived behavioral control, rather than having an impact on behavioral intention to adopt mobile banking (Yu, 2014). Furthermore, self-efficacy indirectly influences Internet banking adoption (Chan & Lu, 2004). In some studies, self-efficacy was found to exert direct influence on mobile banking adoption (Dasgupta, Paul, & Fuloria, 2011; Luarn & Lin, 2005). Self-efficacy is deemed the third influential determinant in mobile banking adoption in Bangkok, in conjunction with subjective norms and perceived usefulness (Sripalawat, Thongmak, & Ngramyarn, 2011).

Hypothesis 7A. Self-efficacy affects behavioral intention in mobile banking adoption.

Hypothesis 7B. Self-efficacy impacts on hedonic motivation in using mobile banking.

Based on the literature review discussed above, the conceptual framework adopted in the present study was developed, as shown in Figure 1.

Research Methodology

Generation Y, in the context of the present study, includes all individuals aged 18–35 years. The population of interest for this research is generation Y individuals who use a mobile banking applications in Thailand. Hence, the study sample was drawn via convenience sampling from mobile banking application users aged 18–35 years that have used this service within the past six months. The data collection was conducted in the local community or business areas in Bangkok. Specifically, this study focused on the customers of Siam Commercial Bank (SCB), Bangkok Bank, and Kasikorn Bank (KBANK). These banks were chosen due to their considerable leading roles and investments in online banking facilities, as they are equally ranked as the most customer-focused banks (Viriyar-ungsarit, 2017).

Data Analysis and Findings

The sample used in the analyses comprised 480 survey responses, as shown in Table 1. This table represents the demographic information of the study participants, including gender, age, education level, occupation, and monthly income, in total and divided across the three mobile banking providers (30.21 percent of respondents used SCB, 25.62 percent Bangkok Bank, and 44.17 percent KBANK).

Before applying the SEM, the fundamental criteria, such as normality, missing values, and presence of outliers, were investigated. Data distribution normality was investigated by calculating skewness and kurtosis (both of which should be within ±2). As normality was established and no missing values or outliers were found in the dataset, it was acceptable for use in further analyses.

Next, Exploratory Factor Analysis (EFA) was conducted and all indicators that had small communalities values of less than .4 (Yong & Pearce, 2013), were eliminated. This resulted in the removal of one question. The KMO value of .854 indicated significance, suggesting that it is appropriate to perform factor analysis. The number of indicators remained at 26, whereby three items pertained to SI, PE, EE, BI, and FC each, four items were related to SEC, five items to SE, and two to HEDONIC (enjoyment).

According to the UTAUT model, PE and EE are distinct constructs. However, the principal component analysis conducted in this study indicated they are located in the same factor with high consistency measurement. As a

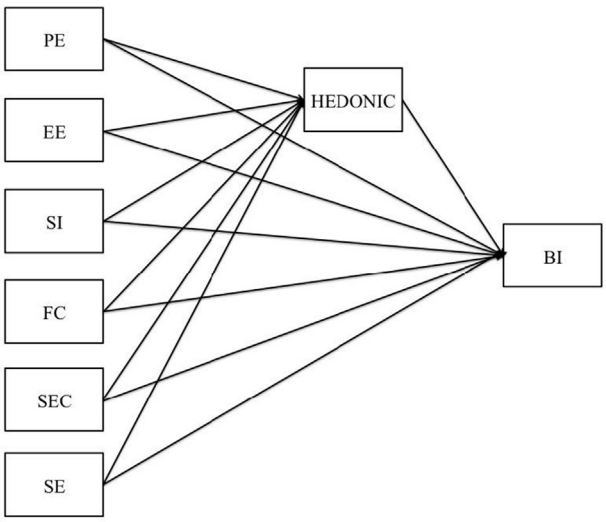

Figure 1 Conceptual framework

Table 1
Respondents' demographic data classified by their mobile banking service provider

Demographic information	SCB		Bangkok Bank		KBANK	
	No	%	No	%	No	%
Gender						
Male (211)	71	14.8	54	11.3	86	17.9
Female (269)	74	15.4	69	14.4	126	26.3
Age						
18–23 years (202)	72	15.0	32	6.7	98	20.4
24–30 years (178)	49	10.2	59	12.3	70	14.6
31–35 years (100)	24	5.0	32	6.7	44	9.2
Education						
Undergraduate (118)	42	8.8	20	4.2	56	11.7
Bachelor's degree (301)	85	17.7	89	18.5	127	26.5
Higher than Bachelor's degree (61)	18	3.8	14	2.9	29	6.0
Occupation						
Student (200)	70	14.6	32	6.7	98	20.4
Government Officer (45)	18	3.8	16	3.3	11	2.3
Employee (168)	39	8.1	56	11.7	73	15.2
Entrepreneur (52)	15	3.1	14	2.9	23	4.8
Freelance (12)	3	.6	4	.8	5	1.0
Other (3)	0	0	1	.2	2	.4
Monthly income						
Less than 15,000 baht (161)	59	12.3	28	5.8	74	15.4
15,001–30,000 baht (184)	53	11.0	53	11.0	78	16.3
30,001–45,000 baht (67)	19	4.0	22	4.6	26	5.4
45,001–60,000 baht (28)	5	1.0	10	2.1	13	2.7
60,001–75,000 baht (11)	2	.4	2	.4	7	1.5
More than 75,000 baht (29)	7	1.5	8	1.7	14	2.9

result, they were merged and the resulting construct was named mobile banking expectancy (MBE), which is defined as the expectancy of using mobile banking to support use of banking services, as shown in Table 2.

Figure 2 shows the results of applying the UTAUT2 model to the data collected as a part of this study. Self-efficacy, facilitating conditions, security, and hedonic motivation are significant to predicting behavioral intention and collectively explain 66 percent of the variance (R-squared). However, the results shown in Figure 3 indicate that the model that excluding hedonic motivation fits the data better than UTAUT2, where hedonic motivation is included as a mediator. Even though self-efficacy and hedonic motivation are significant to predicting behavioral intention, and this result is similar to that yielded by UTAUT2, the variance explained (R-squared) based on the model is nearly 70 percent and is thus better. In addition, data reported in Table 3 indicates that there is a significant difference between the chi-squared value of the revised model and theoretical model at the .05 significance level. According to the parsimonious fit measure, the revised model fits the data better than the theoretical model, as shown in Table 4. Therefore, the revised model was adopted to identify the impact of behavioral intention on using mobile banking.

Mediation Effect Testing

The mediation effect testing procedure (Baron & Kenny, 1986) involves four steps. First, the predictor should have an effect on the dependent variable. According to Figure 2, FC, SEC, and SE have an effect on behavioral intention to use

Table 2
Results of rotated factor loading and composite reliability

Constructs and items	Standardized loading	Composite reliability
Social influence (SI)		
1. I use mobile banking service because of persuasion by family and friends.	.772	.710
2. I use mobile banking service because of bank officer's advice.	.801	
3. I use mobile banking service because of the influence of advertising.	.775	
Performance expectancy (PE)		
4. Mobile banking service is beneficial to me.	.733	.852
5. Mobile banking service is comfortable to use every time and everywhere.	.815	
6. Mobile banking service allows completing transactions faster.	.786	
Effort expectancy (EE)		
7. Ease of use of the mobile banking service makes me want to use it.	.722	
8. Friendly and clear interface makes me want to use mobile banking service.	.545	
9. Fast and good application makes me want to use mobile banking service.	.566	
Facilitating (FC)		
10. Mobile banking application can work properly 24-7 without problems.	.729	.831
11. Mobile banking application is continuously updated.	.783	
12. Mobile banking service is easy to register.	.763	
Security (SEC)		
13. I receive confirmation SMS every time I use mobile banking service.	.758	.814
14. I receive confirmation evidence every time I complete a transaction.	.782	
15. Every time I use mobile banking service, I must provide a transaction password.	.809	
16. A one-time password from SMS is needed for using mobile banking service.	.652	
Self-efficacy in mobile banking application (SE)		
17. I can use mobile banking application without help.	.849	.857
18. I can use mobile banking application by following the manual.	.847	
19. I can use mobile banking application if I can ask for help when needed.	.811	
20. I could use mobile banking application if someone showed me how to do it first.	.643	
21. I could use mobile banking application if I have ever used a similar application before.	.606	
Hedonic motivation (HEDONIC)		
22. I do enjoy using mobile banking application.	.859	.900
23. I have fun when using mobile banking application.	.843	
Behavioral intention (BI)		
24. I intend to use mobile banking application in the future.	.882	.960
25. I think that I would use mobile banking application in the future.	.903	
26. I plan to use mobile banking application in the future.	.902	

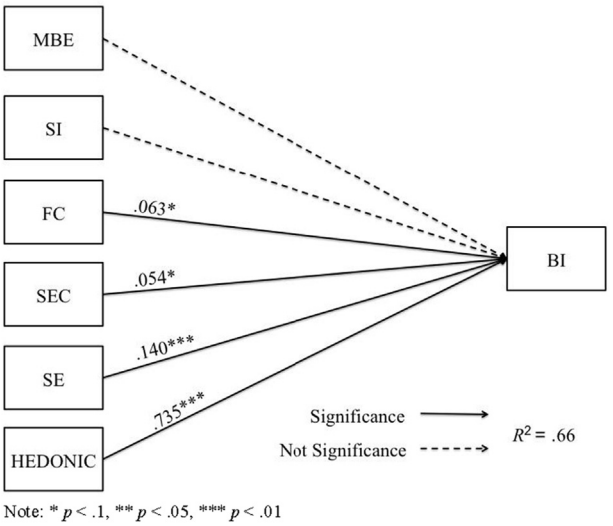

Figure 2 Theoretical model results

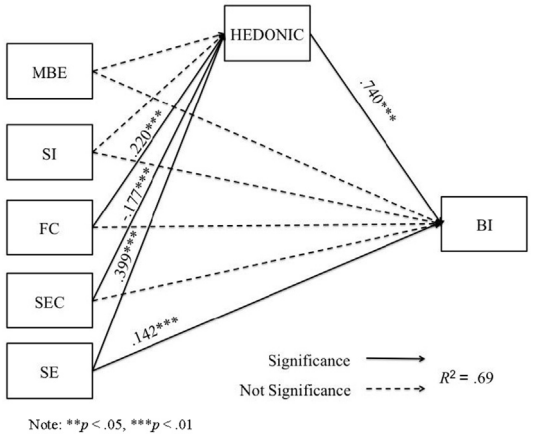

Figure 3 Revised model results

Table 3
Sequential chi-squared testing of model comparison

Comparison model	d.f. Difference	Difference	Sig.
Revised model vs. Theoretical model	6	71.059	<.05

mobile banking. Second, the independent variable must exert an effect through a mediation factor. As a result, with the hedonic motivation as a mediator, FC, SEC, and SE exert influence on hedonic motivation. Third, the mediator must have an effect on behavioral intention. As the results indicate, hedonic motivation affects behavioral intention. Lastly, with a mediation effect, the independent variable should not affect the dependent variable. As can be seen from Figure 3, there are no direct effects between FC and BI or between SEC and BI. Based on the mediation effect testing, hedonic motivation can be considered as a mediator between FC, SEC, and BI.

Some of the proposed hypotheses are supported at the .05 or .01 significance level, as indicated by the asterisk symbol. As shown in Figure 3, two factors—mobile banking expectancy and social influence—do not significantly impact any variables. On the other hand, facilitating condition, security, and self-efficacy in mobile banking application have an indirect effect on mobile banking intention, as it is mediated by hedonic motivation (enjoyment). Furthermore, three factors affect hedonic motivation: facilitating condition, security, and self-efficacy in the mobile banking application. Facilitating condition has a positive effect on hedonic motivation (standardized coefficient = .220, $p < .01$). Security has a negative effect on hedonic motivation (standardized coefficient = −.177, $p < .05$). Self-efficacy in mobile banking application has a positive effect on hedonic motivation (standardized coefficient = .399, $p < .01$). In addition, two factors affecting mobile banking intention are hedonic motivation and self-efficacy in the mobile banking application, both of which have a positive effect on mobile banking intention with standardized coefficients of .740, $p < .01$, and .142, $p < .01$, respectively.

Although self-efficacy in mobile banking application has a direct effect on behavioral intention, its indirect effect has a greater impact because the value of the indirect effect is higher than the value of the direct effect, as shown in Table 5. As a result, hedonic motivation is the mediator between self-efficacy in mobile banking application and behavioral intention.

In addition, the following Sobel test equation was applied to identify the significance of mediator variable (Sobel, 1982).

$$Z = \frac{a \times b}{\sqrt{\left(b^2 \times SE_a^2\right) + \left(a^2 \times SE_b^2\right)}}$$

Table 4
Goodness-of-fit measures for the structural equation model

	Absolute fit measures					Incremental fit measures		Parsimonious fit measures	
	CMIN(df)	CMIN/df	GFI	SRMR	RMSEA	AGFI	NNFI	CFI	RFI
Theoretical model	616.349 (368)	1.675	.922	.0501	.038	.902	.940	.973	.929
Revised model	627.619 (369)	1.701	.950	.0490	.038	.930	.968	.974	.936

Table 5
Total, direct, and indirect effect between self-efficacy and behavioral intention

Dependent variable	Self-efficacy in mobile banking application		
	Total effect	Direct effect	Indirect effect
Behavioral Intention	.613	.198	.415***

Note: ***$p < .01$

$$= \frac{.399 \times .740}{\sqrt{(.740^2 \times .085^2) + (.399^2 \times .038^2)}} = 4.5634$$

where

a is the regression coefficient for the relationship between the independent variable and mediator
b is the regression coefficient for the relationship between the mediator and dependent variable
SE_a is the standard error of a
SE_b is the standard error of b

The calculations confirm the significance of hedonic motivation as a mediator between self-efficacy in mobile banking application and behavioral intention, because the z value is much greater than 1.96 at the .01 significance level.

Conclusion and Implications

The objective of this research was to model generation Y's adoption of the mobile banking system and the factors that influence their use of mobile banking. In this study, the UTAUT model was adopted. The SEM approach was applied to test the hypotheses and investigate the interrelation among impact constructs. According to the results yielded by the study, the revised model was superior to the theoretical model.

According to the study findings, facilitating conditions and self-efficacy in mobile banking application do not exhibit a direct effect on behavioral intention; indeed, they have a positive effect on hedonic motivation. Consequently, hedonic motivation serves as a mediator between facilitating conditions, self-efficacy, and behavioral intention. In addition, security factor has a negative effect on hedonic motivation. Behavioral intention, on the other hand, is positively affected by hedonic motivation and self-efficacy.

Both direct and indirect effects were noted between self-efficacy in mobile banking application and behavioral intention. However, the findings revealed that the indirect effect between self-efficacy in mobile banking application and behavioral intention via hedonic motivation is more significant than the direct effect. By comparing the theoretical model with the revised model, we found that the percentage explaining the behavioral intention for adopting mobile banking is improved to approximately 70 percent.

This study contributes to the extant body of research due to the extension of the UTAUT model in the context of mobile banking adoption of generation Y. The research methodologies, such as determining the sample size, scaling development, validation measurement, testing instrument reliability, and checking appropriate assumptions, were investigated before applying the SEM technique to detect the relationship between the independent variables and the dependent variable.

Hedonic motivation of mobile banking users emerged as the most important factor motivating generation Y to adopt mobile banking. The users will enjoy a mobile banking application system when it works properly without any problems, is continuously updated, and it is easy to register and use the system. The self-efficacy factor in mobile banking application was also shown to significantly relate to hedonic motivation. Thus, if the bank aims to motivate users to use mobile banking, it should offer its clients training in order to ensure that they have the skills and knowledge needed to use the mobile banking application.

The results reported here show that mobile banking system security has a negative relationship with hedonic motivation. Results obtained by analyzing participants' responses to the questions pertaining to the security factors, such as sending a confirmation by SMS, using a one-time password through SMS, and using the password with every transaction, show that users do not appreciate these security measures. The chief information officer of each bank should thus identify the problems related to mobile banking system security in order to solve them or develop a new security system and thus improve the quality of the mobile banking system.

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

Acknowledgments

This research was supported by a grant from the Faculty of Management and Tourism, Burapha University.

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