

UNDERSTANDING THE ADOPTION OF MOBILE BANKING SERVICES: AN EMPIRICAL STUDY

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ABSTRACT

Mobile phone has currently become a vital part of our daily life. With the rapid changes of the technology, many firms offer a variety of services through mobile phones, such as mobile banking services. In this study, we adopt the Unified Theory of Acceptance and the Use of Technology (UTAUT) in order to examine factors influencing mobile banking adoption in Thailand. 500 Thai people living in Bangkok metropolitan area were investigated. Our findings show that five factors led to mobile banking adoption in Thailand are social influence, trust, facilitating conditions, user perception, and user demographic. The results of the study also reveal that the most important factor influencing mobile banking adoption is trust. This study provides very specific information that can assist Thai banking sectors for practical usage.

Keywords: Mobile banking, M-banking, UTAUT, Adoption theory, Technology adoption

1. INTRODUCTION

At present, mobile phones have become one of the most significant factors that support people lifestyle. Many services are now being offered through mobile devices which offer more channels for business to interact with their customers. Banking sectors have also foreseen the essential usage of mobile banking. It has been considered as a salient system because of attributes of mobile technologies such as ubiquity, convenience, and interactivity [Turban et al., 2006]. Mobile banking today offers a variety of services which can be accessed in real time, such as balance inquiries, fund transfer, payment, and many more.

Many banks from all over the world begin to offer mobile banking service to customers. However, utilizing this service from the bank is still limited. For example, the percentage of cell phone users in Korea have risen to 83% of all population, but only a minority of 8.5 percent have adopted the mobile banking service [Gu et al., 2009]. Similarly, only 8.2 percent of 356 million smart phone internet users in China use mobile banking [CNNIC, 2012].

According to the report of mobile subscribers in Thailand, 99 percent of Thai people who have bank accounts tend to have cell phones. In 2001, there were only 7.5 million mobile subscribers in the country. However, it has risen dramatically up to 75.35 million subscribers in 2011 [MICT, 2011]. There are 3 major providers in Thailand, AIS, Dtac, and True, whose market share are 33.5%, 23.3%, and 18.65%, respectively [Bank of Thailand, 2012].

The major activities Thai subscribers utilized the mobile banking service are payment, fund transfer, and transaction updating. The major groups of mobile banking users are top managers, business owners, office workers, students, and people who live in the suburb area.

It is noted that the portion for customers with business purposes (60-70%) and generation Y (15%), which described as the best educated and most culturally diverse generation which exceedingly tolerant and open-minded toward different lifestyles [Wolburg and Pokrywczynski, 2001; KBank, 2008; Booranataweekun, 2008]. Today, the number of agreements that customers have been applied for mobile banking has increased up to 725,143 with the volume of transactions of 7,464 thousand or 82 billion baht [BOT, 2012]. Nevertheless, the majority of Thai people (up to 80 percent) whom are still have not yet adopted the mobile banking service.

This research aims to explore why the numbers of mobile banking adopters are relatively low and identify factors influencing people to adopt mobile banking service. Exploring the research findings and theoretical model will hopefully increase the understanding of mobile banking service based on the unified theory of acceptance and use of technology (UTAUT).

2. LITERATURE REVIEW

Several studies on mobile banking have been conducted recently. Some researchers focused on a single theory while the others attempted to combine two or more theories together in order to explore technology adoption, such as Technology Acceptance Model (TAM), Theory of Planned Behavior (TPB), Social Cognitive Theory (SCT), and Unified Theory of Acceptance and Use of Technology (UTAUT) or a combination of these theories.

TAM, adopted from Theory of Reasoned (TRA), is one of many theoretical models used to explain users' acceptance of a new information technology. TAM applies perceived usefulness and perceived ease-of-use as key determinants. Perceived usefulness is defined as “the prospective user's subjective probability that using a specific application system will increase in his or her job performance within an organizational context”. Perceived ease-of-use is defined as “the degree to which the prospective users expects the target system to be free of effort” [Davis, 1989].

The Theory of Planned Behavior (TPB) is a social psychological model used to explain people behavior to perform certain actions which influenced by intention. It is based on three kinds of factors: behavioral belief, normative belief, and control belief. Behavioral belief is the expected outcome of behavior which leads to either positive or negative attitude toward the behavior. Normative belief refers to social pressure and subjective norms that a person perceives to be accepted or rejected. Lastly, control belief is the perceived factors that simplify or obstruct behavior [Ajzen, 2006].

Furthermore, Social Cognitive Theory (SCT) is a “theoretical framework for analyzing human motivation, thought, and action that embraces an interact model of causation in which behavior, cognition and other personal factors, and environmental influences all operate as interacting determinants that influence each other bidirectional” [Bandura, 1986, p. xi, 2001]. The key element of this theory is self-efficacy, which is a measure of people ability to complete their goals. That is, people in general believe on their own ability and they will design their own performance in order to success in specific situation [Bundura, 1986].

The Unified Theory of Acceptance and Use of Technology (UTAUT) is one of the most widely-used theoretical models. This study also applies UTAUT theory. The model is composed of four key predictors: performance expectancy, effort expectancy, social

influence, and facilitating conditions with the four key contingencies of gender, age, experience, and voluntariness. [Venkatesh et al., 2003]

Table 1: Summary of empirical researches in mobile banking adoption based on several theories

Authors	Theories	Sampling & Countries	Main Findings
Siu, Chan, Lu, and Ming [2004]	TAM and Social cognitive theory	634 questionnaires are collected from undergraduates and graduates universities in Hong Kong	Perceived usefulness, perceived ease of use, subject norm, and self-efficacy are the main factors influencing an adoption and continuous usage of new technology.
Luarn and Lin [2005]	TAM and TPB	180 respondents are surveyed at an e-commerce exposition and symposium in Taiwan	Perceived self-efficacy, financial cost, creditability, perceived ease-of-use, and perceived usefulness had remarkable impact on intention to adopt.
Ratten [2007]	Social cognitive theory	203 Australian youths respondents a surveyed via mail and telephone techniques in Australia	Media exposure, modeling of other, outcome expectancy, self-efficacy and outcome values were proposed to influence the behavioral intention to use mobile banking.
Lee and Chung [2009]	DeLone's and McLean's IS	276 questionnaires are collected from online sampling in South Korea	System quality and the information quality significantly influenced customer's trust and satisfaction.
Ja, Sang, and Yung [2009]	TAM and TRA	910 respondents from web-based surveyed and randomly interviewed managers of banking company in South Korea.	Perceived self-efficacy, perceived ease-of-use, perceived usefulness and trust are the main factors that influence behavioral intention to adopt mobile banking.
Koenig-Lewis, Palmer, and Moll [2010]	TAM and IDT	155 questionnaires are collected from participants in Germany, aged between 18 and 35 years old	Compatibility, perceived usefulness, and risk are influential factors for customer to adopt mobile banking services.
Zhou, Lu, and Wang [2010]	UTAUT and TTF	250 questionnaires are collected from two universities and three service halls in eastern China	Performance expectancy, task technology fit, social influence, and facilitating conditions had significant effects on user adoption and task technology.
Masinge [2010]	TAM and TPB	450 questionnaires are collected from participants in Gauteng Province, South Africa.	Perceived usefulness has a significant impact on the adoption of mobile banking by the BOP.
Sripalawat, Thongmak, and Ngramyard [2011]	TAM and TPB	200 questionnaires were distributed to banking customer and mobile users in Bangkok metropolitan areas through online system	Subjective norm is the most influential factors affecting mobile banking acceptance.
Daud, Kassim, Said, and Noor [2011]	TAM	330 questionnaires are collected from the customers of 11 banks in Malaysia.	Perceived usefulness, perceived credibility and awareness are significantly influence on customer intention to adopt.

Tao Zhou school of management, Hangzhou Dianzi University [2012]	IDT, UTAUT, and TAM	240 questionnaires are collected from a survey at a university located in Eastern China	Central cues, peripheral cues, and self-efficacy are significant effects on initial trust in mobile banking.
Yu [2012]	UTAUT	441 respondents are randomly surveyed in major Taipei downtown areas	Social influence, perceived financial cost, performance expectancy and perceived credibility are the most significant factors that influenced individual intention to adopt mobile banking service.

3. HYPOTHESES

In this research, the UTAUT model is modified. All of the moderators, such as voluntariness, are removed and some other constructs are added (as shown in Figure 1). Voluntariness is a legal and philosophical concept referring to a choice being made by an individual’s willingness. It is effective only when there is a mandatory in the technology usage. In the mobile banking service context, all mobile device users use their technology voluntarily; therefore, this component is eliminated from our model. Furthermore, it is immeasurable in the regression analysis because it is a dummy variable representing a binary values (either 0 or 1). As a result, we cannot clearly indentify the relationships between them [Venkatesh et al., 2003; Dulle and Minishi-Majanja, 2011; Yu, 2012].

Social Influence

Social influence is “the degree to which an individual perceives that others believe he or she should use the new system” [Venkatesh et al., 2003, p.451]. It is based on subjective norms, social factor and image. Zhou et al. (2010) suggested that social influence is an essential predictor of behavioral intention to use mobile banking. In addition, it is believed that the likeliness of user adopting is affected significantly by friends, family and others. Therefore, we propose the following hypothesis:

H₁: Social influence has an effect on individual to adopt mobile banking.

Trust

A common and widely recognized barrier to adopt electronic commerce has been the lack of security and privacy over the internet [Bhimani et al., 1996]. Trust is firm belief in the reliability, truth, or ability of someone or something. Since there are a lot of negative news regarding new technology usage, many people are still afraid that their personal information may be stolen. Therefore, trust needed to overcome their risk perceptions since there is no guarantee of the personal information safety [Luo et al., 2010]. Indeed, trust impacts substantially on their voluntary acceptance of mobile banking [Luarn & Lin, 2005]. This led us to the following hypothesis:

H₂: Trust has an effect on individual to adopt mobile banking.

Facilitating Conditions

Another important factor is facilitating conditions which defined as “the degree to which an individual believes that an organization and technical infrastructure exist to support to use of the system” [Venkatesh et al., 2003, p.453]. The previous study has illustrated that

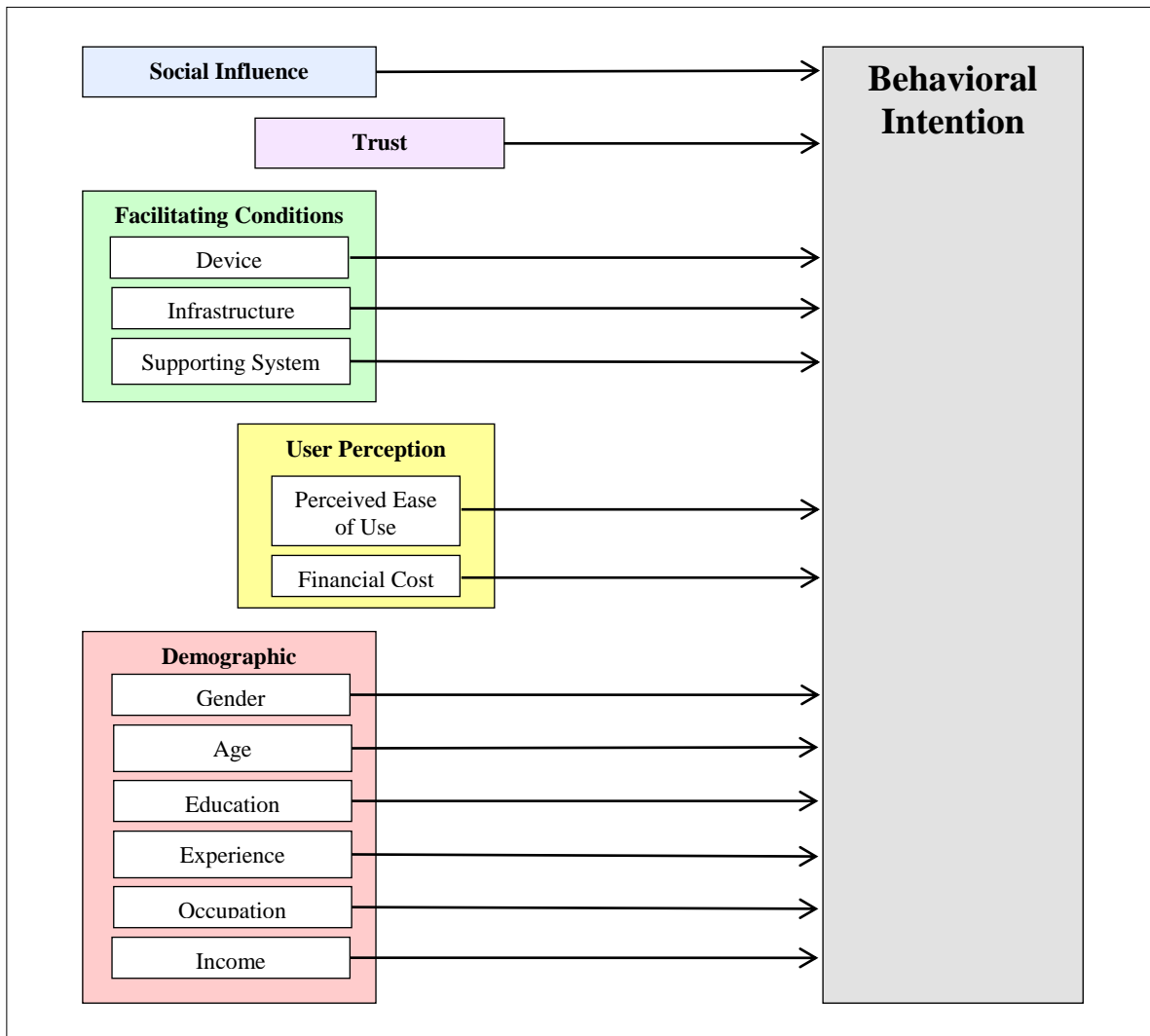


Figure 1: The Proposed Research Model

the more convenience the access of respondents to computer and internet is, the more proficient their computer and internet will be [Joshua and Koshy, 2011]. Thus, the following hypothesis is proposed:

H₃: Facilitating conditions have an effect on individual to adopt mobile banking.

H_{3A}: Devices have an effect on individual to adopt mobile banking.

H_{3B}: Infrastructure has an effect on individual to adopt mobile banking.

H_{3C}: Supporting system has an effect on individual to adopt mobile banking.

User Perception

User Perception is a combination of two main features which are performance expectancy and effort expectancy. Performance expectancy is the degree to which an individual believes that using a particular system would enhance his or her job performance.

Besides, effort expectancy is the degree of ease or difficulty associated with the use of the system [Venkatesh et al., 2003]. Thus, this brings us to the following hypothesis:

H4: User perception has an effect on individual to adopt mobile banking.

H4A: Perceived ease of use has an effect on individual to adopt mobile banking.

H4B: Financial cost has an effect on individual to adopt mobile banking.

Demographic

In this research, demographic is considered by many researchers [e.g., Dasgupta et al., 2011; Dad et al., 2011] to be one of the biggest determinants that significantly influence the mobile banking users' adoption. This factor includes gender, age, occupation, education level, income, and mobile banking experience.

H5: Demographic has an effect on individual to adopt mobile banking.

H5A: Gender has an effect on individual to adopt mobile banking.

H5B: Age has an effect on individual to adopt mobile banking.

H5C: Education has an effect on individual to adopt mobile banking.

H5D: Experience has an effect on individual to adopt mobile banking.

H5E: Occupation has an effect on individual to adopt mobile banking.

H5F: Income has an effect on individual to adopt mobile banking.

4. METHODOLOGY

The research is focused on Bangkok metropolitan area which has the overall population of approximately 5.6 million people [Department of Provincial Administration, 2011]. For data collection, we gathered the data from the location near the bank in the Bangkok metropolitan area. This study aims to collect data for 400 respondents with 95% confidence level based on Yamane's method of sample size [1967]. The sample size was calculated by the following equation:

$$n = \frac{N}{1 + N(e)^2} = \frac{5,674,843 \text{ people}}{1 + 5,674,843 \text{ people} (0.05)^2} = 399.97 \text{ people}$$

where n = Sample size, N = Population Size, e = Level of precision

There were 2 approaches applied for data collection, online data collection and distributed manually. The questionnaires are divided into four main parts. The survey questions are designed using 5-point likert scale ranging from strongly agree to strongly disagree. In addition, a pilot study of 37 respondents has been conducted. The outcome of the reliability analysis by using Cronbach's Alpha is 0.842.

5. RESULTS

5.1 Descriptive Analysis

The total amount of 500 survey questionnaires was distributed. All questionnaires were received but only 87.75 percent of 400 paper based questionnaires and 86 percent of 100 online surveys can be used for the analysis due to missing data and data inconsistency. Among these 437 valid respondents, 39.8 percent is male and 60.2 percent is female. Moreover, 284 out of 437 people (approx. 65 percent) do not use mobile banking or barely know about it. There are only 153 people (35 percent) whom normally use the mobile banking

which are 61 males and 92 females. The largest group composed of respondents whose age range from 26 to 40 years old (42.5 percent). Moreover, the service is very popular among the generation Y and undergraduate students. Approximately 43.8 percent of respondents who utilized the mobile banking service for more than one year. Most of the respondents are knowledge worker (32.7 percent) and earn incomes below 15,000 Baht by 35.5 percent.

5.2 Hypotheses Testing

153 of 437 respondents who adopted the mobile banking service were tested statistically. The results are illustrated in Table 2. In this study, the adjusted R Square is 0.430. The results show that Thai people in Bangkok metropolitan are influence by social influence the most.

Table 2: SPSS Statistics result of variable factors

Hypothesis		Independent Variable	Beta	P-value	Hypothesis supported?
H ₁	-	Social Influence	-0.298	0.000	Yes
H ₂	-	Trust	-0.183	0.013	Yes
H ₃	H _{3A}	Devices	-0.197	0.009	Yes
	H _{3B}	Infrastructure	-0.100	0.262	No
	H _{3C}	Supporting System	-0.054	0.457	No
H ₄	H _{4A}	Perceived Ease of Use	0.005	0.953	No
	H _{4B}	Financial Cost	-0.150	0.042	Yes
H ₅	H _{5A}	Gender	0.188	0.006	Yes
	H _{5B}	Age	-0.233	0.014	Yes
	H _{5C}	Education	-0.047	0.552	No
	H _{5D}	Experience	0.070	0.328	No
	H _{5E}	Occupation	0.327	0.000	Yes
	H _{5F}	Income	-0.204	0.043	Yes

6. CONCLUSION

The results show that for the five determinants modified from the UTAUT model, social influence and occupation influence the users to adopt mobile banking substantially. Similar to the study conducted by Yu [2012] and Sripalawat et al. [2011], they stated that social influence is the most essential factor affecting the m-banking usage. Sripalawat et al. [2011] also mentioned that using mobile banking would make Thai people to stay in trends and sociable since the respondents were highly influenced by peer groups and interpersonal word-of-mouth. Moreover, most adopters are considered as the Generation Y. After they use mobile banking service, they would spread the news to other people. Therefore, the banks should consider them as the main target group for promoting mobile banking.

Although trust ranked the fourth in the list of adoption factors, many respondents' comments complained about the bank's unreliable mobile banking system and stated that they will use mobile banking only when the banking system has improved dramatically. This explains why there is a large gap between smart phone users and mobile bankers. The banks, as the mobile banking providers, still need a lot of improvement in their service's security to regain their customers' reliability and confidence.

A key contribution of this study is for the bank to create a policy to entrust customers more on their service systems. The bank should make use of social influence to promote their service and attract people more. Many comments of the respondents also stated that application fees should not be charged especially to the new customer.

Since the data was collected only in Thailand for a limited time, it may not cover all types of users. The data might be insufficient due to the fact that mobile banking is still new and not widely adopted by Thai people. Moreover, in terms of generalizability, the surveys were not distributed equally to people of all age. This may lead to an incomplete explanation of the results.

The study can be further enhanced by acquiring more samples of mobile users collected in different regions in Thailand for more generalizability and accuracy. More influential factors may be found for better understanding the adoption behavior. Longitudinal research can also be conducted in order to learn about the change of people behavior due to the time factor.

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