FACTORS INFLUENCING THE USAGE
OF MOBILE BANKING

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FACTORS INFLUENCING THE USAGE OF MOBILE BANKING

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ABSTRACT

The objective of this research is to explore correlation of the important factors that affect the usage of mobile banking between three different age groups from 18-60 years old. The key factors comprise of perceived usefulness, perceived ease-of-use, attitude, perceived risk, brand association and low cost transaction.

The results revealed that low cost transaction was the major influencing towards the attitude. The second and third factors were perceived usefulness and perceived ease-of-use respectively. For further analysis, the results showed that the youngest age group was perceived low cost transaction, perceived usefulness, perceived ease-of-use and perceived risk as the significant factors. The second group, 31-45 years old, was perceived low cost transaction and perceived ease-of-use as the important factors. The oldest group was perceived usefulness and perceived low cost transaction as the essential factors. These factors were influenced the attitude towards mobile banking which will directly affect to the usage of mobile banking.

The results of this research would help mobile banking providers to notice the key drivers influencing mobile banking usage, to understand the customer perspective and to set strategy in order to enhance customer satisfaction.

KEY WORDS: Mobile banking/ Attitude/ Behaviour intention/ Low cost transaction/ Technology acceptance model

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CHAPTER I

INTRODUCTION

Technological development has reshaped the business environment during recent years. The banking industry is among one of the leading business sectors in adopting and utilizing the internet and mobile technology on consumer markets. The development of electronic banking services through multiple electronic channels has made it possible to provide new kinds of added value for customers.

The mobile phone as a channel for service consumption offers enormous potential since today, a mobile phone is an integral part of customers' lives and a growing number of these devices are also equipped with internet connection. A customer satisfaction survey (C. Aquino, 2012) revealed that online banking has increased and mobile banking has gained more popularity, especially in mobile application usage. Mobile banking integrates mobile communication technology with appliances to access various banking and financial services (Xie et al., 2009). It is a wireless service delivery channel that offers increased value to customers by providing "anytime, anywhere" access to banking services (Lee and Chung, 2009). Furthermore, there is a vast market potential for mobile banking due to its constantly active functionality and the option to virtually bank at anytime and anywhere.

Mobile banking is a system that allows customers to access banking services through a mobile device such as a mobile phone or tablet. With the rapid and widespread use of mobile devices, banks have realized that mobile banking has a highly and favorable commercial opportunity, particularly due to the increasing costs of operating bank branches and also because of increased competitive pressure in the financial services industry. Therefore, banks have spent a large amount of money developing mobile banking systems to provide customers with various mobile banking services.

Previous studies indicate that factors that contribute to the adoption of mobile banking include convenience, access to the banking service regardless of time

and place, privacy, quick, and effortless service (Laukkanen, 2007). Therefore, consumers assume and expect that through a mobile phone they can readily attain fast, convenient and compatible service on demand.

Although mobile banking enables people to use banking services which have certain advantages over other banking channels (i.e. physical banking branches, auto-teller machines or ATMs, and internet banking), market reports have indicated that the mobile banking usage rate has grown substantially slower than expected (Lassignardie and Desmares, 2012; Google and Ipsos, 2013; Jupiter Research, 2013). In Thailand, the adoption rate in 2014 was approximately 40 percent (Yu and Chantatub, 2015). Compared with other innovative mobile services such as instant short messages or SMS, the adoption rate of mobile banking growing relatively slowly can be considered a slow-diffusion innovative service (Yu and Chantatub, 2015).

This trend of mobile banking indicates a remarkable potential to the banking industry. Nevertheless, retaining mobile banking users and attracting new ones may be difficult and complicated (Devaj, Fan and Kohli, 2002; Gefen, Karahanna and Straub, 2003a). Therefore, to expand customer's usage of mobile banking, the banking industry must identify the important factors affecting customers' intentions to use mobile banking.

Due to fierce competition, the increasing number of mobile banking providers is very high. Most banks in Thailand compete to operate these banking services so as to become the favoured provider. Attracting potential customers and retaining existing customers are crucial to the long-term success of mobile banking services.

This research enables banks to know the key drivers influencing mobile banking users' intentions and, therefore, what aspects to highlight in order to increase the usage of its services. The model presented in this paper will be useful to understand the customer perspective towards mobile banking services.

1.1 Research Objective

To explore the correlation of important factors that affect the usage of mobile banking between three different age groups; 18-30, 31-45 and 46-60 years old.

1.2 Research Design

Many studies have highlighted that demographic characteristics of individuals impact consumers' behavioral responses and recommended that further research should be done to study how different actions influence attitude, particularly with respect to specific demographic variables like age groups (Bulmer and Buchanan-Oliver, 2004; Baker et al., 2002; Dubow, 1995; Rust, 1993). Accordingly, the sample population will be limited in age between 18-60 years old. It will be divided into three age groups for comparison; 18-30, 31-45, and 46-60 years old. The sample population also consists of users and non-users of mobile banking in Bangkok, Thailand.

A proportionate stratified sampling was made up from random samples of sub-groups, and within each strata, convenience sampling was adopted in this study. Therefore, a total of 301 respondents between ages 18-60 are categorized as both stratified and convenience sampling.

The sample is not necessarily representative of the Bangkokian population. However, the target market of mobile banking is likely to be urban so we have a sample which is potentially representative of the target population. The survey for this study was requested in mid-October 2015.

A survey instrument estimates six factors that may influence the usage of mobile banking: perceived usefulness, perceived ease-of-use, attitude, perceived risk, brand association and low cost transaction (Luarn and Lin, 2005; Wang et al., 2006). The quantitative research was comprised of closed-ended questions and a four-point Likert type rating scale. Analysis of variance (ANOVA), correlation coefficient analysis, regression model analysis, confirmatory factor analysis and cross tabulation were used to determine whether these factors influenced the usage of mobile banking services.

This study is structured as follows: The first section summarizes the earlier literatures taking into consideration the factors which may affect the usage of mobile banking and which one is the most important factor. The second section consists of the data findings and acceptance or rejection of the hypotheses. The next is the results and conclusion. The limitations and suggestions for further research will be discussed in the last section of the study.

The contribution of the study is therefore twofold: to focus on factors influencing usage, and to focus on mobile banking services which have recently become attractive channels of financial services. Technology acceptance model (TAM) in the literature will increase the understanding of customer acceptance of mobile banking services.

CHAPTER II
LITERATURE REVIEW

This section of the study discusses and describes the three significant topics; mobile banking, Technology Acceptance Model (TAM) and important factors influencing the usage of mobile banking.

2.1 Mobile Banking

Technological developments in banking make it much easier and cheaper for customers to compare and contrast products and to establish multiple banking connections (Buhl and Will, 1998). Fojt (1996) contends that better communications technology will alter dynamics of purchase decisions. Several authors (e.g. Birch and Young, 1997; Mathe and Dagi, 1996; Gandy and Brierley, 1997) have carried out research on customer requirements. Time, privacy, control and economy are among the important aspects with which customers are concerned with. People are becoming busier and thus are seeking to perform transactions at a time of their convenience. This is confirmed by the increase in telephone assisted banking and also widespread use of the now common automated teller machines (ATMs).

Todays' customers are often aware of the expenses associated with banking and are generally better informed about alternative options. Any service provided must be at minimal cost or competitive cost, and preferably free. Furthermore, internet banking allows most transactions to be performed at the click of your mobile device (De Young, 2001b). Compared to traditional banking, internet banking is characterized by the inability to make deposits and cash withdrawals (Maughan, 2012).

Technological development has reshaped the business environment during the recent years including the banking industry. The development of electronic

banking services through multiple electronic channels has made it possible to provide new kinds of added value for customers.

The proliferation and adoption of mobile phones, together with advances in mobile technology, have expedited the development of mobile services or M-services (Sullivan Mort and Drennan, 2007; Wang et al., 2006). M-services are defined as "enhanced information services accessed while mobile" (Sullivan Mort and Drennan, 2007, p.302). An emerging component of M-services that could become a significant revenue source to both banks and telecom service providers is mobile banking or M-banking (Nysveen et al., 2005). M-banking involves conducting account balance and transaction history inquiries, funds transfers, bill payments, stock trades, and portfolio management, via a mobile device (Suoranta and Mattila, 2004). It provides value for consumers, above other banking channels, through ubiquitous access, time convenience, and mobility (Anckar and D'Incau, 2002; Luarn and Lin, 2005). Despite its many advantages, the use of mobile phones in banking services is still in its infancy and internet banking retains its position as the leading channel in electronic banking (Luakkanen, 2207a; Laukkanen and Cruz, 2009).

Mobile banking represents an innovation where both multifaceted intangible service and a technologically innovative medium of service delivery are present (Rao and Troshani, 2007). Moreover, internet banking users and mobile banking users were found to have various demographic characteristics.

2.2 Technology Acceptance Model (TAM)

Technology acceptance model (TAM) is an adoption of the Theory of Reasoned Action (TRA), which claims that behavior is a direct consequence of behavioral intention (Fishbein and Ajzen, 1975). Researchers proposed TAM to explain why a user accepts or rejects technology by adapting TRA (Davis, Bagozzi and Warshaw, 1989). TAM has been widely studied and verified by different studies that examine the individual technology acceptance behavior in different information systems constructs.

The technology acceptance model describes the consumer's willingness to use technology. According to TAM, behavioral intention is influenced by a user's attitudes towards a product which in turn is affected by the perceived usefulness and the perceived ease of use of the product (Davis et al., 1989). These two factors will be discussed in the next topic for further explanations. Research has suggested that usefulness is a significant factor for the mobile services acceptance (Koivumaki et al., 2006; Wang et al., 2006).

Lack of user acceptance is a significant impediment to the success of new technologies (Gould et al. and Nickerson). In fact, users are often unwilling to use technologies which, if used, would result in impressive performance gains (Alavi Henderson and Seanson, 1988). Therefore, user acceptance has been viewed as the pivotal factor in determining the success or failure of any recent technology projects (Davis, 1993).

This model will help to clearly understand customers' behaviors. If customers tend to accept new technology of the banking services, they may have a positive attitude toward the usage of mobile banking. On the contrary, if they tend to reject mobile banking services, they will have a negative attitude toward its usage.
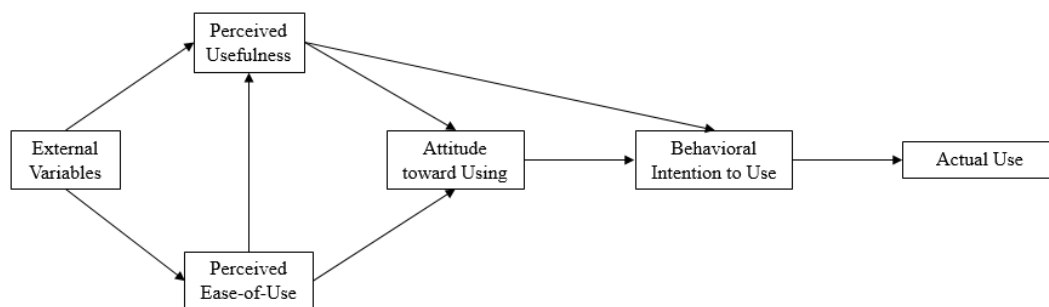
Figure 2.1 Technology Acceptance Model (Davis et al., 1989)

2.3 Important factors influencing the usage of mobile banking

The prevalence of mobile technology in daily life has increased the popularity of mobile banking. There are six important factors that may affect the usage of mobile banking; brand association (brand awareness and brand image), perceived risk, perceived usefulness (no time and place limitation), perceived ease-of-use, lower price transaction and attitude.

In the model, both perceived usefulness and also perceived ease-of-use predict attitude defined as the user's evaluation of the desirability to use the system of mobile banking for this study. The individual's intentional behavior is directly influenced by the attitude and perceived usefulness. TAM is found to be able to provide a reasonable illustration of a user's intention to use technology (Legris et al., 2003). It has also been widely utilized in research to determine the probability of adopting, online system and user perceptions of system use (Alsajjan and Dennis, 2010; Teo et al., 1999; Gefen and Straub, 2000; Moon and Kim, 2001). The following subsections discuss relevant literatures.

2.3.1 Perceived Usefulness

Internet banking is a service provided to bank customers on a 24-hour basis (Gurau, 2002 and Munusamy et al., 2010), seven days a week (Nasri, 2011). Customers can check their account information at any time of the day (Turban et al., 2000). They do not have to wait for banks to open for their transactions because as stated by Gerlach (2000), internet banking is a bank that never closes and there is no need for waiting in line as the transactions are performed quickly (Lee and Lee, 2000; Al-Mudimigh, 2007; Dude et al., 2009). Traditional banks are characterized by long queues especially during peak hours of the day (The Times of India, 2011). Hence, there are several customers complain as they get tired in waiting for their turn of their time is wasted and they delayed (Sulaiman, 2000). Internet banking services are very rapid; they enable the customers to do their transactions on their own time without having to wait in line.

As suggested by Dixon and Nixon (2000), mobile banking provides fast service and allows customers to do their transactionsat their convenience. Kwan (2000) also affirmed that customers can access their accounts, make transfers or pay their bills without having to wait in queue. This is because they can do all these transactions through the bank's application and because this service is tailored as per the customers' needs (Daniel, 1999). Hence, mobile banking provides convenience for consumers with no limitation time and place.

Lin (2011) suggests that when users perceive relative advantage or usefulness of a new technology over an old one, they will tend to adopt it (McClosey,

2006; Rogers, 2003). In the context of mobile banking adoption, benefits such as immediacy, convenience and affordability to customers have been reported. Moreover, many studies have given evidence of the significant impact of perceived usefulness on the usage of mobile banking (Tang et al., 2004; Amin et al., 2007; Mallet et al., 2009; Riquelme and Rios, 2010; Tan et al., 2010).

In conclusion, perceived usefulness of mobile service context can be categorized by how well mobile services can be integrated into a person's daily activities. If customers feel these services are beneficial to their personal and business lives, it will positively influence them to use these services.

H1. Perceived usefulness positively affects the attitude towards using mobile banking.

H2. Perceived usefulness positively affects the behavioral intention to use mobile banking.

2.3.2 Perceived Ease-of-Use

Given the technical limitations of mobile devices, ease-of-use becomes an imminent acceptance driver of mobile applications (Venkatesh, 2000). Ease-of-use is defined as the extent to which a person believes that using a particular system will be effortless. This is especially true for mobile banking which compete with established banking solutions and thus needs to provide benefits when it comes to ease-to-use. It is significant to note that, especially for non-users, it is the perception of ease-of-use rather than actual system characteristics which underlie this construct (Venkatesh and Davis, 1996). Furthermore, following prior research (Eriksson et al., 2005), it was proposed that the easier and more intuitive mobile banking is perceived to be, the more positive the assessment of their usefulness (Venkatesh et al., 2003).

Mobile banking users are reluctant to use mobile banking if services either require more mental effort than traditional banking services, or are time consuming or even frustrating. Therefore, the positive attitude of consumers towards mobile banking and consumers' intention to use the services decreases as users find it too complex to learn how to use mobile banking.

H3. Perceived ease-of-use positively affects the perceived usefulness of mobile banking.

H4. Perceived ease-of-use positively affects the attitude towards using mobile banking.

2.3.3 Attitude

Attitude refers to an individual's positive or negative evaluation of the performance effect of a particular behavior. Attitudes structure can be described in terms of an ABC model (Solomon, 2008). This model is consisting of the three components: affect, behavior, and cognition. Affective component is a personal feelings or emotions. Behavior refers to the way a person behaves when exposed to an attitude object. Cognition is the final component. It defines as the thoughts and beliefs person has about an attitude of object.

According to the theory of reasoned action (Ajzen and Fishbein, 1980) and the theory of planned behavior (Ajzen, 1985), technology patterns, perception of risk and brand associations affect attitudes towards using mobile banking. Therefore, increasing innovative patterns decrease perceived risk. Meanwhile, an increasing perceived brand association improves consumer attitudes towards using mobile banking.

H5. Attitude towards using mobile banking positively affects the behavioral intention to use mobile banking.

In view of the above, we propose the following research hypothesis.

2.3.4 Perceived Risk

According to the Federal Reserve (FRB, 2012), consumer adoption of mobile banking and mobile payment technologies are obstructed by security concerns and the possibility of hackers remotely accessing consumers' phones. Consumer attitudes regarding whether mobile banking or mobile payment technologies are adequately secure is correlated with their use of these technologies. Therefore, consumer-perceived risk is important when deciding whether or not to acquirea new technology or service (Sylvie and Xiaoyan, 2005).

As is well known, privacy may the most serious disadvantage of mobile banking services with concerns over external intrusion resulting in the inspection of personal financial details and even the removal of money from accounts (Littler and

Melanthiou, 2006). Therefore, there is widespread concern over the privacy of the internet or a smart phone when used to purchase financial products.

As for the mobile banking, perceived risk is even more important, owing to the threat of privacy and security concern (Luarn and Lin, 2005). Particularly, mobility increases the threat of security violations arising from the required infrastructure for wireless applications. Hence, mobile banking users are concerned about risk since more vulnerable points in the telecommunication process can be found between mobile phones than between fixed devices (Corradi et al., 2001). Fear of loss of PIN code may also pose security threats (Kuisma et al., 2007). Additionally, some users are concerned with the possibility that hackers can access their bank accounts via stolen PIN code (Poon, 2008). Lastly, some users may also have a fear of loss or theft of a mobile device with stored data (Coursaris et al., 2003). Perceived risk is thus more likely to adversely impact the usage of mobile banking.

Security risk arises due to fraud and the presence of a hacker who might hack the account of internet users (Reavley, 2005). Customers have the impression that the internet is not secure for banking transactions and fear that "someone will have unlimited access to personal financial information" (Peterson, 1997). In fact, Sathye's (1999) study revealed that 73 percent of the customers were not willing to adopt this service because of security concern. Furthermore, researchers (Littler and Melanthiou, 2006) purport that this issue is likely to generate a monetary loss in the customers' mind and as such, they believe that they are afraid of cyber threat. This perception is damaging the customer's confidence in the whole system of internet banking. Aladwani (2001) stated that security is one of the leading future challenges of online banking.

H6. Perceived risk negatively affects the attitude towards using mobile banking.

2.3.5 Brand Association

Brand association consists of brand awareness and brand image. Given the ability of brand awareness to offer relevant information about a brand and product or service, consumers unfamiliar with the brand find it difficult to make purchasing decisions based on the brand image of product or service. Therefore, consumers spend

more time on websites with familiar brand recognition than on those websites with unfamiliar recognition.

Researchers (Christodoulides and de Chernatony, 2004) concluded that online brand awareness affects brand image. Consumers purchase services from providers with a good brand image, owing to the ability of the latter to provide superior quality service (Shankar et al., 1998). Ruyter et al. (2001) suggested that company reputation and brand image definitely affect customer purchasing decisions regarding electronic services.

Most studies discuss how a good brand image positively affects attitudes toward that brand (Shwu-Lng and Chen-Lien, 2009; Sevier, 2001; Bogart and Lehman, 1973; Moore and Steve, 2000; Ravi et al., 2005; Da Silva and Alwi, 2006; Wong and Merrilees, 1998; Vahie and Paswan, 2006). Kotler (2000) suggested that an improved brand image of products or services may increase the intention to use or buy that product or service.

H7. Brand association positively affects the attitude towards using mobile banking.

2.3.6 Low Cost Transaction

An examination of research in the area of M-banking reveals that cost, which is defined by Luarn and Lin (2005, p.879) as the extent to which "a person believes that using M-banking will cost money", has a significant negative effect on intention to use M-banking and its related technologies (Luarn and Lin, 2005; Wang et al., 2006).

Nowadays, banks offer mobile banking services at prices lower than what the customer would have to incur if they had to be involved in traditional banking transactions. Currently, banks are not charging fees for mobile banking services. However, your phone provider may tack on extra changes.

H8. Low cost transaction positively affects the attitude towards using mobile banking.

CHAPTER III
RESEARCH METHODOLOGY

Many studies have highlighted demographic characteristics of an individual consumer's behavioural responses and recommended that further research should be done to study how different actions influence attitude, particularly with respect to specific demographic variables like age groups (Bulmer and Buchanan-Oliver, 2004; Baker et al., 2002; Dubow, 1995; Rust, 1993). Accordingly, the sample population was limited in age between 18-60 years. It was divided into three age groups for comparison; 18-30, 31-45, and 46-60 years old. The sample population also consisted of users and non-users of mobile banking in Bangkok, Thailand.

A proportionate stratified sampling was taken across samples of sub-groups, and within each strata, convenience sampling was adopted in this study because of research time limitations. Convenience sampling refers to the collection of information from individuals who are conveniently available to provide it. Therefore, a total of 301 respondents from age; 18-60 are collected as both stratified and convenience sampling.

The sample is not necessarily representative of the Bangkokian population. However, the target market of mobile banking is likely to be urban so we have a sample which is potentially representative of the target population. The survey for this study was requested in the mid-October 2015 by voluntary participation.

The methodological approach was in a quantitative type of research which was comprised of closed-ended questions. This study intended to point out factors that influence the usage of mobile banking, which could be achieved by a survey method. Since the study wanted to answer what questions, the survey method is considered the most appropriate. This approach is mainly based on questionnaires that were conducted online in the form of Google Forms. Also, Google Forms were used to collect data through various sources, i.e. social media channel (Facebook) and instant messaging application (Line). Individuals who participated in this survey were given a

brief explanation about the purpose of the study. The questionnaire's hyperlink was attached when it was released. The questionnaire was in Thai language. The secondary data was used to make the study more accurate, and was derived from reliable news sources and academic articles.

In order to study the factors influencing the usage of mobile banking between age groups, a questionnaire was constructed. The construction was done by reviewing previous research on various theories and models in the related area. Wording modifications were done wherever required to match the current research objective. The questionnaire was constructed of:

(1)   Perceived usefulness

(2)   Perceived ease-of-use

(3)   Perceived risk

(4)   Brand association

(5)   Low cost transaction

(6)   Attitude

The definitions of these six constructs and the related studies are present in Table 1.

Table 3.1 Theoretical constructs identified for the study and the definitions

Construct	Definition	Prior Study
Perceived usefulness	The degree to which individuals believe that using the new technology will enhance their task	Davis (1989)
Perceived ease-of-use	The degree to which an individuals believe that using a particular technology will be effortless	Davis (1989)

Table 3.1 Theoretical constructs identified for the study and the definitions (Cont.)

Perceived risk	The user's subjective expectation of suffering a loss in pursuit of the desired outcome while using mobile banking services	Wu and Wang (2005)
Brand association	Brand awareness affects brand image	Christodoulides and de Chernatony (2004) Ruyter (2001)
	Brand image affects customer's decisions regarding mobile banking services	
Low cost transaction	The possible expenses of using mobile banking services	Wu and Wang (2005)
Attitude	An individual's evaluation of the performance effect of a particular behavior	Ajzen (1991)

The survey questionnaire consisted of three parts. The first part was about general questions to the respondent's technology adoption of mobile banking services and information related to the mobile banking application e.g. whether they had downloaded the mobile application to their mobile device or not, and whether or not they used any functions of this application. The respondent's perception about each item that influenced the usage of mobile banking was asked in the second part of the questionnaire. This part covered all six constructs that were already mentioned in Table 1. Finally, the last part of the questionnaire is recorded the demographic information of respondents. The demographic variables were gender, age, education level, occupation, and monthly income.

Researchers (Cronbach, 1950; Goldberg, 1981; Nunnally, 1967) have compared the difference between even and odd numbers of scale points. Conclusions showed that employing both even and odd numbers of scale points were indeterminate, as the middle category in a scale with an odd number of points has been found to result in response sets. Comparing even numbers of scale options would eliminate this confusion. Therefore, the rating scale in this study will be four-point Likert type scales, from totally disagree (a score of 1) to totally agree (a score of 4). Analysis of variance (ANOVA), correlation coefficient analysis, regression model analysis, confirmatory factor analysis and cross tabulation was used to determine whether these factors influenced the usage of mobile banking services. The questionnaire asked 28 questions.
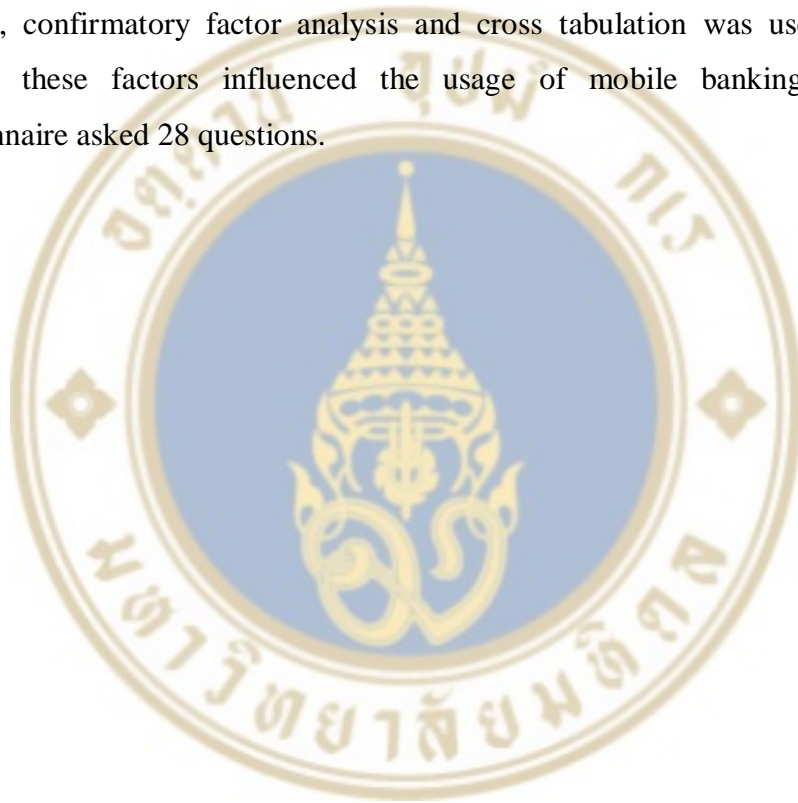
CHAPTER IV
DATA ANALYSIS

The data was collected from convenience sampling through various sources including social media channel (Facebook) and instant messaging application (Line) in of the form of a Google Forms questionnaire. Since this study was conducted in Thailand, the questionnaire was translated using back translation. Items were first translated into Thai language. After the data was collected, the questionnaire was translated from Thai back into English to assure the consistency. The survey for this study was requested from 16-23 October 2015. IBM SPSS Statistics 22 was used to obtain descriptive statistics and to undertake most analysis in this research. Another program that was used for confirmatory factor analysis was XLSTAT-Marketing.

4.1 Demographic Profile of Respondents

According to Table 4.1, the demographic profile of the respondents illustrated that there were 301 respondents who participated in this research. From a gender perspective, there were 195 female respondents and 106 male respondents. Females represented the majority at 65 percent, and 25 percent were males.

As regards to the age groups of respondents, the respondents were divided into three subgroups. This survey showed that 172 respondents (57 percent) were 18-30 years old, 66 respondents (22 percent) were 31-45 years old and 63 respondents (21 percent) were 46-60 years old.

In terms of educational level, the majority of respondents (171) had bachelor's degrees (57 percent). 114 respondents (38 percent) had master's degrees. Other two levels were high school with 8 respondents (3 percent) and Ph.D. with 7 respondents (2 percent) respectively.

As for occupational classifications, almost half of the respondents (135 respondents or 45 percent) were office workers, students (48 respondents or 16

percent), government staff (30 respondents or 10 percent), business owners (27 respondents or 9 percent), self-employed (19 respondents or 6 percent), and housewife/husband (14 respondents or 5 percent). Retired, management executives, others and not-employed were less than 5 percent of the respondents.

Another point to note is monthly income which displayed that 91 respondents (30 percent) had income between 15,000-30,000 baht, 48 respondents (16 percent) had income below 15,000 baht, 57 respondents (16 percent) had income between 30,001-45,000 baht, 35 respondents (12 percent) had income between 45,001-60,000 baht, 33 respondents (11 percent) had income above 100,000 baht, 25 respondents (8 percent) had income between 60,001-75,000 baht, and 22 respondents (7 percent) had income between 75,001-100,000 baht respectively.

In conclusion, most of the respondents were females between the ages of 18-30 years old. Their educational level was bachelor's degree. They worked as office workers with monthly income between 15,000-30,000 baht.

Table 4.1 Demographic profile of the respondents illustrated

Measures	Items	Frequency	Percent
Gender	Male	106	35
	Female	195	65
	Total	301	100
Age	18-30	172	57
	31-45	66	22
	46-60	63	21
	Total	301	100
Education	High school	8	3
	Bachelor's degree	171	57
	Master's degree	114	38
	Ph.D.	7	2
	Others	1	0
	Total	301	100

Table 4.1 Demographic profile of the respondents illustrated (Cont.)

Occupation	**Student**	**48**	**16**
	Government staff	30	10
	Office worker	135	45
	Management executive	8	3
	Business owner	27	9
	Self-employed	19	6
	Housewife/husband	14	5
	Retired	10	3
	Not-employed	3	1
	Others	7	2
	Total	301	100
Monthly income	Below 15,000	48	16
	15,000-30,000	91	30
	30,001-45,000	47	16
	45,001-60,000	35	12
	60,001-75,000	25	8
	75,001-100,000	22	7
	Above 100,000	33	11
	Total	301	100

4.2 Analysis of Variance (ANOVA)

Analysis of Variance (ANOVA) is used to compare the differences among means for two or more populations (Malhotra and Birks 2007). ANOVA was used to analyse the hypothesis in which the mean score was different; the significant level of <0.05 was accepted with 95 percent confidence.

4.2.1 Factors and the Attitude

This research tested the independent variable with the dependent variables. This included both three different age groups and also factors that affected the

attitudes towards mobile banking, in order to see the relationship between these variables. According to the analyses shown in Table 4.2:

H1: Perceived usefulness positively affects the attitude towards using mobile banking.

H4: Perceived ease-of-use positively affects the attitude towards using mobile banking.

H6: Perceived risk negatively affects the attitude towards using mobile banking.

H7: Brand association positively affects the attitude towards using mobile banking.

H8: Low cost transaction positively affects the attitude towards using mobile banking.

Table 4.2 ANOVA testing results between three different age groups and factors that affect the attitude towards mobile banking

Dependent Variable	Age	n	Mean	Sig.
I think I will use mobile banking if it is useful	18-30 years old	172	3.320	0.000
	31-45 years old	66	**3.348**	
	46-60 years old	63	2.889	
	Total	301	3.236	
I think I will use mobile banking if it is easy to conduct banking transactions	18-30 years old	172	**3.355**	0.000
	31-45 years old	66	3.318	
	46-60 years old	63	2.905	
	Total	301	3.252	
I think I will not use mobile banking because of risk	18-30 years old	172	2.314	0.000
	31-45 years old	66	2.167	
	46-60 years old	63	**2.762**	
	Total	301	2.375	
I think I will use mobile banking if the brand has a good image and good reputation	18-30 years old	172	3.105	0.228
	31-45 years old	66	**3.197**	
	46-60 years old	63	2.984	
	Total	301	3.100	

Table 4.2 ANOVA testing results between three different age groups and factors that affect the attitude towards mobile banking (Cont.)

Dependent Variable	Age	n	Mean	Sig.
I think I will use mobile banking if the costs are inexpensive	18-30 years old	172	3.273	0.027
	31-45 years old	66	**3.379**	
	46-60 years old	63	3.063	
	Total	301	3.252	

According to Table 4.2, ANOVA testing between three different age groups and factors that affect the attitude towards mobile banking showed that four results of Sig-value = 0.000 which is less than 0.05 level of significance; perceived usefulness, perceived ease-of-use, perceived risk and low cost transaction. It can be concluded that there was a difference among these variables. Therefore, the hypotheses below were **accepted**:

H1: Perceived usefulness positively affects the attitude towards using mobile banking.

H4: Perceived ease-of-use positively affects the attitude towards using mobile banking.

H6: Perceived risk negatively affects the attitude towards using mobile banking.

H8: Low cost transaction positively affects the attitude towards using mobile banking.

This result illustrated the difference of each age groups toward factors that affect the attitude towards mobile banking. Compared to other age groups, respondents 31-45 years old were perceived usefulness and perceived low cost transaction more than the other two age groups. Respondents 18-30 years old were perceived ease-of-use more than other age groups. The last age group, respondents 46-60 years old, perceived risk more than the younger groups.

In contrast, brand association showed the result of Sig-value = 0.228 which is more than 0.05 level of significance. As a result, H7: Brand association positively affects the attitude towards using mobile banking was **rejected**.

4.2.2 The Attitude and the Intention to Use

This research tested three different age groups and the attitude towards mobile banking. The analysis results are shown in Table 4.3 according to:

H5: Attitude towards using mobile banking positively affects the behavioral intention to use mobile banking

Table 4.3 ANOVA testing results between three different age groups and the attitude towards mobile banking

Dependent Variable	Age	n	Mean	Sig.
	18-30 years old	172	3.291	0.002
I think using mobile	31-45 years old	66	**3.439**	
banking is interesting	46-60 years old	63	3.095	
	Total	301	3.282	

ANOVA testing between three different age groups and the attitude towards mobile banking illustrated the result of Sig-value = 0.002 which is less than 0.05 level of significance. It can be concluded that there is a difference among these variables. In addition, the respondents aged between 31-45 years old have more interested in mobile banking when compared to other age groups.

Further analysis towards H5, this research tested three different age groups and the usage of mobile banking to observe more on the correlated relationship of the attitude and the usage of mobile banking.

Table 4.4 ANOVA testing results between three different age groups and the usage of mobile banking

Dependent Variable	Age	n	Mean	Sig.
	18-30 years old	172	3.366	0.000
I think I will use mobile	31-45 years old	66	**3.409**	
banking in the future	46-60 years old	63	2.984	
	Total	301	3.296	

According to Table 4.4, the testing results showed that Sig-value = 0.000 which is less than 0.05 level of significance. It can be concluded that the difference in age groups is influenced by the usage of mobile banking. The respondents between 31-45 years old had more intention to use mobile banking when compared to other age groups.

Therefore, it can be assumed that the respondents aged between 31-45 years old who had interested in mobile banking will be influenced by the usage of mobile banking. H5: Attitude towards using mobile banking positively affects the behavioral intention to use mobile banking was accepted.

4.3 Correlation Coefficient Analysis

Correlation can be used to examine the relationships between two or more ordinal or scale variables (AJ Veal, 2005). If two circumstances are related in a systematic way they are said to be correlated. The correlation coefficient (r) explains the relationship between -1 to 1 and illustrate the direction of positive and negative relationship of independent variables and dependent variables (Lehman, 2005).

Sig. (2-tailed) is required to be < 0.05, so that the variable will be accepted which means 95 percent confidence. Furthermore, Sig. (2-tailed) can be < 0.01 which means 99 percent confidence. In terms of the strength of relationships, correlation results higher than |0.5| are categorized as a high correlation. In contrast, correlation results that lower than |0.5| are categorized as a low correlation. Another point to note is the sign of the result. If it shows plus (+) or no sign, there is positive correlation between two variables, while minus (-) sign shows negative correlation (AJ Veal, 2005). The closer r is to +1 or -1, the more closely the two variables are related.

Table 4.5 Correlations results toward seven variables

		Perceived usefulness	Perceived ease-of-use	Perceived risk	Brand association	Low cost transaction	Attitude	Behavior intention
Perceived usefulness	Person Correlation	1.000	**.663***	-.300**	.435**	.513**	.625**	.608**
	Sig. (2-tailed)		0.000	0.000	0.000	0.000	0.000	0.000
Perceived ease-of-use	Person Correlation	.663*	1.000	-.256**	.463**	.479**	.574**	.627**
	Sig. (2-tailed)	0.000		0.000	0.000	0.000	0.000	0.000
Perceived risk	Person Correlation	-0.300**	-2.56**	1.000	-.145*	-.145*	-.254**	-.301**
	Sig. (2-tailed)	0.000	0.000		.012	.012	0.000	0.000
Brand association	Person Correlation	.435**	.463**	-.145*	1.000	.355**	.412**	.435**
	Sig. (2-tailed)	0.000	0.000	.012		0.000	0.000	0.000
Low cost transaction	Person Correlation	.513**	.479**	-.145*	.355**	1.000	.561**	.531**
	Sig. (2-tailed)	0.000	0.000	.012	0.000		0.000	0.000
Attitude	Person Correlation	**.625***	**.574***	-.254	**.412***	**.561***	1.000	.748**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000		0.000
Behavior intention	Person Correlation	**.608***	.627**	-3.01**	.435**	.531**	**.748***	1.000
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

From Table 4.5, correlations results showed all of seven variables were significant as Sig. (2-tailed) is required to be < 0.05. Correlation results will be referred to according to the hypotheses in chapter 2 which is the literature review. The results are shown in Table 4.6.

Table 4.6 Correlation results toward the hypotheses

	Sign of correlation		Level of correlation	
	Positive	Negative	High	Low
H1: Perceived usefulness and the attitude	✓		0.625	
H2: Perceived usefulness and the behavioral intention	✓		0.608	
H3: Perceived ease-of-use and perceived usefulness	✓		0.663	
H4: Perceived ease-of-use and the attitude	✓		0.574	
H5: Attitude and the behavioral intention	✓		0.748	
H6: Perceived risk and the attitude		✓		0.254
H7: Brand association and the attitude	✓			0.412
H8: Low cost transaction and the attitude	✓		0.561	

There were high and positive correlation; between perceived usefulness and the attitude at r = .625. Perceived usefulness and the behavioral intention were high and positively correlated at r = .608. Perceived ease-of-use and perceived usefulness were high and positively correlated at r = .663. Perceived ease-of-use and the attitude were high and positively correlated at r = .574. Attitude and behavioral intention were high and positively correlated at r = .748. Brand association and the attitude were low and positively correlated at r = .412. Low cost transaction and the attitude were high and positively correlated at r = .561. On the other hand, perceived risk and the attitude were low and negatively correlated at r = -.254.

In conclusion, all of the following hypotheses were **accepted**:

H1: Perceived usefulness positively affects the attitude towards using mobile banking.

H2: Perceived usefulness positively affects the behavioral intention to use mobile banking.

H3: Perceived ease-of-use positively affects the perceived usefulness of mobile banking.

H4: Perceived ease-of-use positively affects the attitude towards using mobile banking.

H5: Attitude towards using mobile banking positively affects the behavioral intention to use mobile banking.

H6: Perceived risk negatively affects the attitude towards using mobile banking.

H7: Brand associate positively affects the attitude towards using mobile banking.

H8: Low cost transaction positively affects the attitude towards using mobile banking.

Therefore, the correlation coefficient analysis testing in Table 4.6 could be concluded that all variables were somewhat correlated.

4.4 Regression Model

Regression analysis is used to predict relationships between variables (Field, 2013). The regression model will comprised of a model summary, an ANOVA table and Coefficients.

4.4.1 Factors and the Attitude

The attitude towards mobile banking and five factors have been analysed. The factors are: perceived usefulness (PU), perceived ease-of-use (PEU), perceived risk (PR), brand association (BA) and low cost transaction (LCT). This analysis is according to:

H1: Perceived usefulness positively affects the attitude towards using mobile banking.

H4: Perceived ease-of-use positively affects the attitude towards using mobile banking.

H6: Perceived risk negatively affects the attitude towards using mobile banking.

H7: Brand association positively affects the attitude towards using mobile banking.

H8: Low cost transaction positively affects the attitude towards using mobile banking.

To accept the analysis, a significant level in the ANOVA table is required to be < 0.05. In this part of the research, the ANOVA table showed the result of Sig-value = 0.000 which is less than 0.05 level of significance. Therefore, this analysis is accepted and there is a relationship between these variables (Lehman, 2005).

The model summary explained in Table 4.7 shows the r square value between the attitude and factors analysis. R square value represents the correlation between variables. The value will range from 0-1. The closer to 1, the more variables are related. This table illustrates the r square at 0.503 which is equal to 50.3% of the overall correlation between the attitude and five factors.

Table 4.7 Model summary of the attitude and five factors

Model	R Square	Adjusted R Square
Attitude	0.503	0.495

In the coefficients table, the significant level is required to be < 0.05 so that the results will be accepted. Table 4.8 illustrates that there were three factors that had a relationship with the attitude towards mobile banking. The three factors were perceived usefulness, perceived ease-of-use, and low cost transaction. Perceived risk in H6: Perceived risk negatively affects the attitude towards using mobile banking and brand association in H7: Brand association positively affects the attitude towards using mobile banking were both **rejected**.

Furthermore, B value or beta value in the unstandardized coefficients column is used to see how strong these factors are toward the attitude. The highest

value means the most important factor (Peter, 2015). Table 4.8 illustrates coefficients between the attitude towards mobile banking and five factors.

Table 4.8 Coefficients of the attitude and five factors

Model		Unstandardized Coefficients		Sig.
		B	**Std. Error**	
Attitude	(constant)	1.104	0.173	0.000
	Perceived usefulness	0.254	0.049	0.000
	Perceived ease-of-use	0.149	0.047	0.002
	Perceived risk	-0.039	0.027	0.148
	Brand association	0.070	0.038	0.068
	Low cost transaction	0.299	0.041	0.000

Beta value will be used in the regression model to compare the correlation towards the attitude which is:

$$Y = a + b1PU + b1PEU + b1LCT$$

Y value represents the dependent variable, which in this research is the attitude towards mobile banking. A value represents the beta value of a constant variable. Bi value represents the beta value of each significant factor. The regression model in this research is:

$$Y = 1.104 + 0.254PU + 0.149PEU + 0.299LCT$$

Due to the fact that attitude and factors are psychological factors which cannot be measured by numbers, this model illustrates which factors were the most effective towards attitude. The results showed that low cost transaction (0.299) had the most imfluence towards the attitude. The second and third factors were perceived usefulness (0.254) and perceived ease-of-use (0.149) respectively.

In conclusion, all of the hypotheses were **accepted**:

H1: Perceived usefulness positively affects the attitude towards using mobile banking.

H4: Perceived ease-of-use positively affects the attitude towards using mobile banking.

H8: Low cost transaction positively affects the attitude towards using mobile banking.

4.4.2 Factors and the Attitude between Three Different Age Groups

Since the objective of this research is to explore the correlation of factors between three different age groups, further regression analysis was used. In this research, the ANOVA table showed the result of Sig-value = 0.000 which is less than 0.05 level of significance. Therefore, this analysis is accepted and there is a relationship between these variables (Lehman, 2005).

The model summary explained in Table 4.9 shows r square value of the attitude and factors analysis between three different age groups. This table illustrates the r square of 18-30 years old at 0.503, 31-45 years old at 0.42 and 46-60 years old at 0.553 respectively.

Table 4.9 Model summary of the attitude and five factors between three different age groups

Age	R Square	Adjusted R Square
18-30 years old	0.522	0.508
31-45 years old	0.420	0.372
46-60 years old	0.553	0.510

Table 4.10 shows the coefficients between three different age groups and factors toward the attitude. The first age group of 18-30 year olds illustrated that there were four factors that had a relationship with the attitude towards mobile banking. The four factors were low cost transaction (0.246), perceived usefulness (0.235), perceived ease-of-use (0.228) and perceived risk (-0.063).

The second age group of 31-45 year olds illustrated that there were two factors that had a relationship with the attitude. Low cost transaction (0.272) and perceived ease-of-use (0.207) affected the attitude towards mobile banking in this age group. The last age group of 46-60 year olds illustrated that there were also two factors

that had a relationship with the attitude. Perceived usefulness (0.337) and low cost transaction (0.209) influenced the attitude towards mobile banking.

Table 4.10 Coefficients of the attitude and five factors between three different age groups

Age		Unstandardized Coefficients		Sig.
		B	Std. Error	
18-30 years old	(Constant)	0.842	0.239	0.001
	Perceived usefulness	0.235	0.069	0.001
	Perceived ease-of-use	0.228	0.067	0.001
	Perceived risk	-0.063	0.037	0.089
	Brand association	0.078	0.05	0.124
	Low cost transaction	0.246	0.056	0.000
31-45 years old	(Constant)	1.436	0.417	0.001
	Perceived usefulness	0.143	0.110	0.197
	Perceived ease-of-use	0.207	0.104	0.050
	Perceived risk	0.008	0.061	0.892
	Brand association	-0.031	0.081	0.704
	Low cost transaction	0.272	0.094	0.006
46-60 years old	(Constant)	1.155	0.346	0.002
	Perceived usefulness	0.337	0.108	0.003
	Perceived ease-of-use	0.003	0.100	0.976
	Perceived risk	-0.037	0.055	0.500
	Brand association	0.141	0.093	0.136
	Low cost transaction	0.209	0.085	0.017

Note that the difference in beta value in the first two age groups were not big. This might be due to a limitation of the research as being small and unrepresentative of sample size.

4.5 Confirmatory Factor Analysis

XLSTAT-Marketing program was used for confirmatory factor analysis. Confirmatory factor analysis (CFA) is a special form of factor analysis which is the technique that is used when the number of independent variables is large and there is a desire to group them in some way. This analysis is based on the idea that certain variables are aliged so that people with a high score on one variable will tend to have a high score on certain others, which might then form a new group (A. Veal, 2005).

As the objective of this research is to explore factors that affect the usage of mobile banking, confirmatory factor analysis was used. To determine significant variables, factor loadings were used to identify a correlation between the original variable, in order to determine the significant value.

McDonald (1999, 2000) considered that simple loadings is at least three items per group factor, but more items will be considered as cross-loadings. Cross-loadings are indicative of covariance in CFA. The values will range from 0-1. The closer to 1, the more variables are related.

Table 4.11 shows cross-loadings between factors influencing the attitude towards mobile banking and questions based on each factor. From a broad observation, this table illustrates a correlation of the factors and the questions in each group because the values are closer to 1.

Table 4.11 Cross-loadings table between factors influencing the attitude towards mobile banking and questions based on each factors

	PU	PEU	PR	BA	LCT	ATT	BI
PU1	**0.779**	0.527	-0.139	0.364	0.364	0.053	0.496
PU2	**0.801**	0.521	-0.165	0.336	0.390	0.439	0.445
PU3	**0.854**	0.602	-0.198	0.417	0.366	0.532	0.571
PU4	**0.748**	0.496	-0.250	0.371	0.326	0.459	0.373
PU5	**0.835**	0.689	-0.280	0.413	0.513	0.625	0.608
PEU1	*0.604*	**0.884**	-0.270	0.378	0.417	0.531	0.524
PEU2	*0.580*	**0.874**	-0.220	0.413	0.375	0.510	0.470
PEU3	*0.683*	**0.867**	-0.229	0.449	0.489	0.574	0.627

**Table 4.11 Cross-loadings table between factors influencing the attitude
towards mobile banking and questions based on each factors (Cont.)**

	PU	PEU	PR	BA	LCT	ATT	BI
PR1	-0.097	-0.095	**0.671**	0.022	-0.080	-0.078	-0.118
PR2	-0.041	-0.060	**0.617**	0.039	-0.012	-0.041	-0.048
PR3	-0.306	-0.303	**0.972**	-0.102	-0.124	-0.254	-0.301
BA1	0.230	0.254	0.116	**0.695**	0.186	0.186	0.181
BA2	0.416	0.428	-0.092	**0.875**	0.284	0.395	0.428
BA3	0.388	0.388	-0.068	**0.850**	0.212	0.344	0.323
BA4	0.456	0.425	-0.131	**0.777**	0.361	0.412	0.435
LCT1	0.314	0.361	-0.089	0.329	**0.633**	0.358	0.316
LCT2	0.372	0.363	-0.061	0.190	**0.857**	0.424	0.416
LCT3	0.493	0.460	-0.133	0.306	**0.871**	0.561	0.531
Attitude (ATT)	**0.656**	0.621	-0.227	0.433	0.568	1.000	**0.748**
Behavior intention (BI)	**0.631**	0.629	-0.274	0.447	0.536	0.748	1.000

Overall, these values were higher than 0.6 and closer to 1. It can be assumed that questions based on each factor were well represented.

4.6 Consumer Behavior

From Table 4.12 shows consumer behavior towards mobile banking. Most respondents (96 percent) had seen or heard of mobile banking services. Of all the respondents, 71 percent have used this service. The frequency of using mobile banking per week was diversified; 47 percent of respondents used mobile banking 1-3 times per week, 18 percent of respondents used mobile banking from 4 to more than 9 times per week, and 35 percent of respondents did not match the other options.

Table 4.12 Consumer behavior towards mobile banking

Measures	Items	Frequency	Percent
Have you seen or heard of	Yes	290	96.35
mobile banking services?	No	11	3.65
	Total	301	100.00
Have you used mobile	Yes	214	71.10
banking?	No	87	28.90
	Total	301	100.00
Frequency of using	1-3 times	141	46.84
mobile banking per week	4-6 times	26	8.64
	7-9 times	7	2.33
	More than 9 times	22	7.31
	Others	105	34.88
	Total	301	100.00

4.6.1 Cross Tabulation

The cross tabulation table is used to analyze the relationship between two or more variables, and will be displayed as the Chi-square table. The Chi-square tests table is used to determine if there is a significant relationship between two variables. It tells if a significant relationship is statistically significant but does not indicate the strength of the relationship (SPPS for Introductory Statistics, 2004). The significant level in Pearson Chi-square is < 0.05 and will be accepted with 95 percent confidence. From SPSS analysis, the Chi-square tests table showed Sig-value at 0.000 which is less than 0.05.

Table 4.13 shows consumer behavior between three different age groups and mobile banking usage. It illustrates that 71 percent of respondents have used mobile banking. Of the 71 percent of the current users, 44 percent of respondents were 18-30 years old, 18 percent of respondents were 31-45 years old, and 10 percent of respondents were 46-60 years old respectively.

Table 4.13 Cross tabulation table of consumer behavior between three different age groups and mobile banking usage

		Have you used mobile banking?		Total
		Yes	No	
18-30 years old	Count	132	40	172
	% within Age	76.7%	23.3%	100.0%
	% within Have you used mobile banking?	61.7%	46.0%	57.1%
	% of Total	43.9%	13.3%	57.1%
31-45 years old	Count	53	13	66
	% within Age	80.3%	19.7%	100.0%
	% within Have you used mobile banking?	24.8%	14.9%	21.9%
	% of Total	17.6%	4.3%	21.9%
46-60 years old	Count	29	34	63
	% within Age	46.0%	54.0%	100.0%
	% within Have you used mobile banking?	13.6%	39.1%	20.9%
	% of Total	9.6%	11.3%	20.9%
Total	Count	214	87	301
	% within Age	71.1%	28.9%	100.0%
	% within Have you used mobile banking?	100.0%	100.0%	100.0%
	% of Total	71.1%	28.9	100.0%

CHAPTER V
CONCLUSION

The objective of this research is to explore the correlation of important factors that affect the usage of mobile banking between three different age groups from 18-60 years old. Most of the respondents in this research were female whose ages were between 18-30 years old. Their educational level was bachelor's degree. They worked as office workers with monthly income; between 15,000-30,000 baht.

According to mobile banking awareness, 96 percent of respondents had seen or heard of mobile banking services. Of all respondents, 71 percent have used this service. They can be divided into three different age groups; 44 percent of 18-30 year olds, 18 percent of 31-45 year olds and 10 percent of 46-60 year olds. Moreover, almost half of the respondents (47 percent) used mobile banking 1-3 times per week.

Regression and correlation analysis were used in this research to explore the relationship between variables of the factors and the attitude towards mobile banking service. The results showed that low cost transaction had the most influence on the attitude. The second and third factors were perceived usefulness and perceived ease-of-use respectively. All of these variables showed high a correlation value. In short, low cost transaction was the major influence in the attitude towards mobile banking.

Further analysis toward the objective is to explore the difference; between three different age groups. The results showed that the younger age group, 18-30 year olds, considered perceived low cost transaction, perceived usefulness, perceived ease-of-use and perceived risk as the significant factors. The second group, 31-45 year olds, considered perceived low cost transaction and perceived ease-of-use as the important factors. The older group, 46-60 year olds, considered perceived usefulness and perceived low cost transaction as the essential factors. These factors influenced the attitude towards mobile banking.

From ANOVA analysis, the testing results showed that respondents aged 31-45 years old were more interested in mobile banking and had more intention to use mobile banking in the future.

The proposed model in Figure 5.1 was validated according to the objective of this research. This model was tested by using various analyses to observe the difference and the relationship between variables. The model was different from the original TAM model; perceived risk and low cost transaction were added in the proposed model.
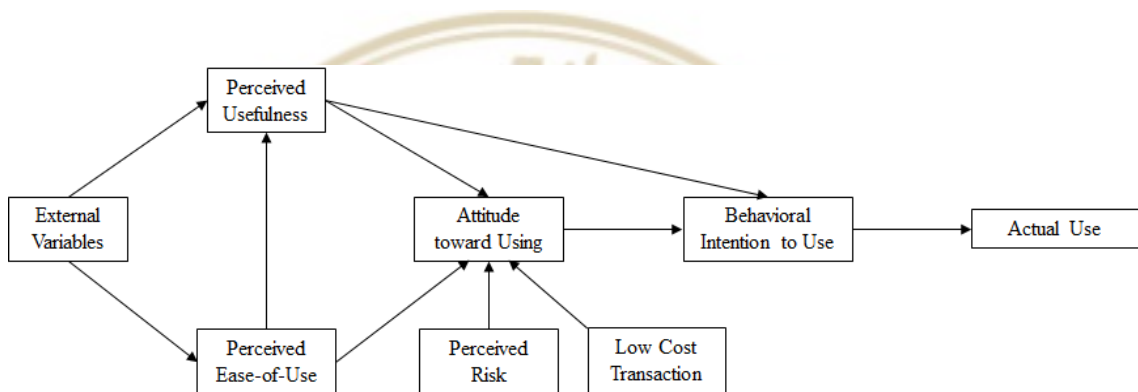

Figure 5.1 Proposed model based on TAM model

In conclusion, all of the hypotheses below were accepted:

H1: Perceived usefulness positively affects the attitude towards using mobile banking.

H2: Perceived usefulness positively affects the behavioral intention to use mobile banking.

H3: Perceived ease-of-use positively affects the perceived usefulness of mobile banking.

H4: Perceived ease-of-use positively affects the attitude towards using mobile banking.

H5: Attitude towards using mobile banking positively affects the behavioral intention to use mobile banking.

H6: Perceived risk negatively affects the attitude towards using mobile banking.

H8: Low cost transaction positively affects the attitude towards using mobile banking.

The results revealed that there were five factors that affect the usage of mobile banking between three different age groups: perceived usefulness, perceived ease-of-use, attitude, perceived risk and low cost transaction.

5.1 Theoretical Implication

The present research was highlighted the importance of factors influencing the usage of mobile banking between three different age groups in Bangkok. The development of the model in Figure 5.1 by extending the TAM model, it included low cost transaction and perceived risk. The proposed model can be used to explain and predict customers' attitudes towards mobile banking services.

To prove the TAM model, perceived usefulness, perceived ease-of-use and the attitude were tested respectively. ANOVA results showed that there were the difference between perceived usefulness and the attitude. Correlation coefficient analysis were analyzed and showed that there were high and positive correlations between these two variables. Accordingly, regression analysis results also confirmed the relationship. Moreover, perceived usefulness and intentional behavior showed high and positive correlations so that perceived usefulness was proven to be the significant factor in the proposed model in Figure 5.1.

Perceived ease-of-use was also proven to be the one of the significant factors as the ANOVA, correlation coefficient analysis and regression analysis results illustrated that perceived ease-of-use and the attitude illustrated high and positive correlations. Furthermore, perceived ease-of-use and perceived usefulness showed high and positive correlations between the variables.

In addition, the attitude was the considerable factor in the TAM model. ANOVA and correlation coefficient analysis results verified that there were high and positive correlations between the attitude and intentional behavior towards mobile banking service.

Apart from literature review factors, other factors were analysed to examine attitudes towards using mobile banking services. Due to ANOVA, correlation coefficient analysis and regression analysis results displayed high and positive

correlations between low cost transaction and the attitude. As a result, low cost transaction was the essential factor that added into the proposed model.

Perceived risk was the vital factor in the proposed model in Figure 5.1. ANOVA, correlation coefficient analysis and regression analysis results show the relationship between perceived risk and the attitude towards mobile banking. Therefore, low cost transaction and perceived risk justified the effects toward the attitude of mobile banking usage. Both of these essential factors were included in the proposed model as shown in Figure 5.1.

5.2 Recommendations

The research showed that most of the respondents had awareness of mobile banking services. The younger group was the main user of these services. The remaining group, 31-60 year olds, should be motivated in order to increase the usage of mobile banking.

The results of this research would help mobile banking providers to notice the key drivers influencing mobile banking usage, to understand the customer perspective and to set strategies in order to enhance customer satisfaction. Mobile banking providers should consider of the key factor which is low cost transaction. In the research finding, low cost transaction was the factor that affected the attitude of all age groups. This factor illustrated a high correlation to the attitudes that influence the usage of mobile banking. If mobile banking providers can set and provide a strategy that creates a low cost transaction, they will gain more mobile banking users.

Consistent with previous research (Tang et al., 2004; Amin et al., 2007; Mallet et al., 2009; Riquelme and Rios, 2010; Tan et al., 2010), perceived usefulness was the significant factor that affected the attitude towards the usage of mobile banking. The providers should ensure that their service will enhance customers' tasks. Another factor was perceived ease-of-use, respondents had a positive attitude if mobile banking service was effortless. Perceived risk was also a vital factor; the providers should ensure that mobile banking will be used effectively without any uncertainty.

Therefore, these factors should be considered in order to increase mobile banking users. These factors were influenced the attitude towards mobile banking which will directly affect to the usage of mobile banking.

Mobile banking providers should take note of the value adding characteristic of mobile banking service in promoting these key factors with customers' lifestyles in mind. Customers need to be shown how useful mobile banking is, and how easily it fits their lifestyles.

5.3 Limitations

This study's objective is to explore the correlation between the important factors that affect the usage of mobile banking between three different age groups; 18-30, 31-45 and 46-60 years old. This study had some limitations that should be addressed.

This study had some potential limitations, as it focused on investigating the factors that affect the usage of mobile banking in Bangkok. Further than Bangkok has not been tapped. Also, the data was collected only on Thai nationals and ages between 18-60 years old; other age ranges were not considered. Therefore, the scope of this study covers only some Thai nationals which may not represent the whole population.

The generalization of the study may be impacted by the fact that the demographic profile is distorted towards younger females. This may be due to a bias towards respondents who are proficient in using technology introduced by the data collection method selected i.e. web-based survey with instant messaging invitation.

Furthermore, the limitation is related to convenience sampling which is one of a non-probability sampling. This kind of sampling is not representative of the entire population. Self-reporting bias is a common problem in the methodology used. The questionnaire was administered online using a self-reporting scale to measure research variables, which could contribute to a method bias. Also, time limitation was another important limitation. Questionnaires were collected within only one week.

According to the TAM model in this study, five factors have been chosen as dependent factor that might affect the attitude and the intentional behavior. Nevertheless, there are other factors that might also affect the attitude and the intentional behavior of the usage of mobile banking which need to be further explored.

Moreover, the model is a measure as a single point in time. Attitudes can certainly change over time. There are two theories that can be applied to this situation. First is the elaboration likelihood model (ELM). This theory is similar to the ABC model. The ELM model will be based on the level of involvement in the purchase (Petty & Cacioppo, 1981). Another is the social judgment theory that offers another explanation for attitude changes, whereby a consumer compares current information to prior understandings (Novack, 2010). This change has implications for researchers interested in predicting mobile banking usage over time and may assure a longitudinal study.

5.4 Suggestions for Future Study

For future studies, researchers should randomize their sample to include other geographical areas outside Bangkok and other nationalities to create more generalized data. As the results reflect significantly on younger female, the data may be biased. Also, the sample size between groups should be at least 100 respondents in order to make the research more accurate. The sample size may affect the precise result as the larger sample size will represent more on a significant level. Therefore, researchers should increase the sample size.

Another point is the sampling method. Future studies should use probability sampling which it can represent the entire population. A research design that includes greater sampling range is recommended. A larger scale study with a more representative sample could be conducted to validate the model of this study and to enhance the generalization of the research conclusions.

Pilot testing should be done in order to validate and clarify of the questionnaire. This will help respondents to answer the questionnaire if it is easy to

understand. Moreover, this testing will be able to reach all the potential respondents due to the time limitation.

In addition, the findings in this research need to be further validated as the results have provided only a broad exploration. Some specific constructs have been predetermined and external variables in the model were not tapped.

Future studies may be devoted to explore the correlation of the attitudes that affect the usage of mobile banking, as this research was focused on the factors influencing the attitude towards mobile banking. Furthermore, understanding the behavior of those mobile banking services users who had initial user experience should be conducted in the future.

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APPENDICES

APPENDIX A:

Questionnaire

"Factors influencing the usage of mobile banking between three different age groups"

The objective of this survey is to explore the important factors that affect the usage of mobile banking between different age groups. This questionnaire will take approximately 10-15 minutes to complete.

The questionnaire is a part of Master degree thematic paper at College of Management Mahidol University. All information will be used for research objective only, it will be kept confidential.

Part 1: Screening Questions
1. Have you seen or heard of mobile banking services?

☐ Yes   ☐ No
2. Have you used mobile banking?

☐ Yes   ☐ No (skip question number 3)
3. Frequency of using mobile banking per week

☐ 1-3 times   ☐ 4-6 times   ☐ 7-9 times
☐ More than 9 times   ☐ Others, please specify……

Part 2: Factors that may influence the usage of mobile banking
Please indicate the level of agreement towards the following statements

	1 Totally disagree	2 Disagree	3 Agree	4 Totally agree
4. I think mobile banking enables me to save time as there is no need to visit bank's branch and no need to queue up				
5. I think mobile banking is a convenient way to conduct banking transactions (everywhere, every time)				

Part 2: Factors that may influence the usage of mobile banking (Cont.)

	1 Totally disagree	2 Disagree	3 Agree	4 Totally agree
6. I think using mobile banking would make it easier for me to conduct banking transactions				
7. I think mobile banking allows me to manage finance efficiently				
8. I think I will use mobile banking if it is useful				
9. I think mobile banking is easy to learn				
10. I think mobile banking is easy to use				
11. I think I will use mobile banking if it easy to conduct banking transactions				
12. I fear that while I am using mobile banking, information about my transactions might be interfered by others				
13. I fear that while I am using mobile banking, the connection will be lost				
14. I think I will not use mobile banking because of risk				
15. Whenever I think of mobile banking, I first link to that brand				
16. Mobile banking brand that I thought has a good image (make me feel at ease and relief)				
17. Mobile banking brand that I thought has a good reputation				
18. I think I will use mobile banking if the brand has a good image and good reputation				
19. I think the mobile banking fee is low cost				
20. I think I will use mobile banking if I could pay bills cheaper				

Part 2: Factors that may influence the usage of mobile banking (Cont.)

	1 Totally disagree	2 Disagree	3 Agree	4 Totally agree
21. I think I will use mobile banking if the costs are inexpensive				
22. I think using mobile banking is interesting				
23. I think I will use mobile banking in the future				

Part 3: Demographic

24. What age groups do you belong to?

☐ 18-30 years old ☐ 31-45 years old ☐ 46-60 years old

25. What is your gender?

☐ Male ☐ Female

26. What is your educational level?

☐ High school or below ☐ Bachelor's Degree ☐ Master's Degree
☐ Ph.D. ☐ Others, please specify ……

27. What is your current occupation?

☐ Student ☐ Government staff ☐ Office worker
☐ Management executive ☐ Business owner ☐ Self-employed
☐ Housewife/husband ☐ Retired ☐ Unemployed
☐ Others, please specify ……

28. What is your personal monthly income?

☐ Below 15,000 baht ☐ 15,000-30,000 baht
☐ 30,001-45,000 baht ☐ 45,001-60,000 baht
☐ 60,001-75,000 baht ☐ 75,001-100,000 baht
☐ Above 100,000 baht

This is the end of the questionnaire.
Thank you very much for your participation.