

Adoption of Mobile Banking Services: An Empirical Examination between Gen Y and Gen Z in Thailand

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Abstract—The younger generations in Thailand are more open than ever in adoption of non-traditional banking services. However, the factors influencing Gen Y and Gen Z to adopt mobile banking services might be different. The purpose of this study is to identify the significant factors that affect the adoption of mobile banking application and services, by conducting an empirical investigation on generation comparison, between Gen Y and Gen Z in Thailand. To test the framework, descriptive analysis, correlation analysis, collinearity analysis, and multiple linear regression analysis were applied to the primary data, which consist of 400 survey collected from mobile banking users in Gen Y and Gen Z in Thailand. The results show that compatibility, perceived usefulness, and self-efficacy are significantly and positively affect customer intention to adopt the services in both generations. Interestingly, social influence has significantly affected adoption of mobile banking only in Gen Z.

Index Terms—Adoption; Factors, Gen Y; Gen Z; Mobile Banking.

I. INTRODUCTION

Mobile banking provides customers with services in conducting financial transactions anywhere, anytime simply by using a mobile handheld device and data plan. Mobile banking facility removes space and time limitations of normal banking activities such as checking account balances or transferring funds from one account to another. This technological advancement has become one of the powerful tools in transforming traditional banking services to an online mass-market reaching to wider customer bases. The majority of the customers are expected to conduct financial transactions via the mobile channel because banking industries and mobile technologies are now converging. However, compared to the rapid growth in mobile device in recent years, the adoption rate of mobile banking services is considered slow [1].

Various prior researches about mobile banking service adoption are limited to the study of a total population in a country, focus groups of early adopters, or a specific mobile banking application. This study aims to go beyond the aforementioned limitations to investigate and compare various factors influencing customer adoption in the current market situation in Thailand from two generations: generation Y (Gen Y) and the generation Z (Gen Z).

II. LITERATURE REVIEW

A. Overview of Mobile Banking Customers in Thailand

Young Thai customers are more open than ever before in considering non-traditional alternatives for their financial services. Along with the many new adults entering the consumer society, they are becoming new banking clients. These younger generations love to try new things and need customized services. They also expect a broad range of products suited to their lifestyle, personal circumstances and can be persuaded by social influence [2].

Hodgkinson mentioned that in order to stay competitive and to better maintain connections with customers in the digital age, banks try to stimulate the popularity of mobile banking by making it easier for customers to use [2]. Mobile banking services have been developed to be more personalized to customers in Thailand. The report from Bank of Thailand indicated that the penetration rate of mobile banking users rose slightly from 1.1% in 2011 to 9.3% in 2014 [3].

Mortimer et al. found that the factors influencing Thai customers to adopt mobile banking were perceived usefulness, perceived risk, and social influence [4]. However, the results were from samples in all generations with only 8 percent in Gen Z.

B. Theoretical Background

1) Technology Acceptance Model (TAM)

TAM was developed specifically by Davis [5], for investigating users' behavior to the impact of technology adoption and is becoming the most influential and popular model for assessing and predicting users' acceptance of emerging information technology. The model proposes that both perceived usefulness and perceived ease of use of the technology are the two key factors that influence the individual's attitude toward using the technology. In 2005, the extended TAM also was studied by adding one trust-based construct (perceived credibility) and two resource-based constructs (perceived self-efficacy and perceived financial cost) in mobile banking context.

2) Theory of Planned Behavior (TPB)

TPB is a theory which predicts intentional behavior, because behavior can be planned. Originally, the pure TPB model focuses on behavioral intention being a function of attitude and subjective norm [6]. In addition to the pure model, the decomposed TPB was introduced by Ajzen [7].

The model mentions that attitude, subjective norms and perceived behavioral control make an impact to customers' intention to adopt mobile banking services [8].

3) Diffusion of Innovation Theory (DOI)

DOI was developed by Rogers [9]. The model explains the way an idea or a product gains momentum and spread through a specific population or social system over time. The model also mentions that there are five main factors that influence adoption of an innovation which are relative advantage, compatibility, complexity, trialability and observability, and each of these factors play to a different extent in the five adopter categories.

C. Generational Cohorts

1) Generation Y (Gen Y)

Gen Y refers to the population born during 1977 to 1994 and is in the age range for 22-39 as of 2016 [10]. Gen Y individuals are well grounded and wise for their age. They are born into a technological and wireless society with global boundaries becoming more transparent.

2) Generation Z (Gen Z)

Gen Z refers to the population born after 1994 and is less than 22 years old as of 2016 [10]. Gen Z is the never lived without the Internet [11]. Gen Z is born with technology and grew up with e-books, music downloads and websites. Peer acceptance is very important to them.

III. HYPOTHESES DEVELOPMENT AND RESEARCH MODEL

A. Perceived Usefulness

Perceived usefulness is defined as the extent to which an individual believes that he or she would benefit from using mobile banking [12]. It is highly predictable that people use mobile services because they find it useful. Therefore, the study hypothesizes are:

H1a. Perceived usefulness has significant impact on mobile banking adoption for Thai Gen Y customers.

H1b. Perceived usefulness has significant impact on mobile banking adoption for Thai Gen Z customers.

B. Perceived Ease of Use

Perceived ease of use is defined as "the degree to which a person believes that using a particular system would be free of effort [5]. Karahanna et al. found that perceived ease of use had a significant positive effect on intention to adopt the software among the potential adopters [13]. Therefore, the study hypothesizes are:

H2a. Perceived ease of use has significant impact on mobile banking adoption for Thai Gen Y customers.

H2b. Perceived ease of use has significant impact on mobile banking adoption for Thai Gen Z customers.

C. Perceived Cost

Perceived cost is defined as the extent to which a person believes that he or she has the financial resources needed to use mobile banking [14]. To use mobile banking services, users are required to have suitable mobile device and internet services and this can be costly to some. Therefore, the study hypothesizes are:

H3a. Perceived cost has significant impact on mobile banking adoption for Thai Gen Y customers.

H3b. Perceived cost has significant impact on mobile banking adoption for Thai Gen Z customers.

D. Perceived Risks

Perceived risks is defined as the user's subjective expectation of suffering a loss in pursuit of a desired outcome [15]. This includes when mobile device is being hacked, stolen and financial risks in losing money when using the services such as stopping payments. Therefore, the study hypothesizes are:

H4a. Perceived risk has significant impact on mobile banking adoption for Thai Gen Y customers.

H4b. Perceived risk has significant impact on mobile banking adoption for Thai Gen Z customers.

E. Compatibility

Compatibility is defined as individuals are more likely to adopt an innovation if they find it compatible with their past experience, beliefs and the way they are accustomed to work [16]. Compatibility was found to indirectly influence intention to use through perceived ease of use [17]. Therefore, the study hypothesizes are:

H5a. Compatibility has significant impact on mobile banking adoption for Thai Gen Y customers.

H5b. Compatibility has significant impact on mobile banking adoption for Thai Gen Z customers.

F. Self-efficacy

Self-efficacy is defined as the belief that one has the ability, knowledge and skill to perform a specific behavior [18]. Previous studies show that a person with low self-efficacy in IT will be more resistant to the new technology [17]. Therefore, the study hypothesizes are:

H6a. Self-efficacy has significant impact on mobile banking adoption for Thai Gen Y customers.

H6b. Self-efficacy has significant impact on mobile banking adoption for Thai Gen Z customers.

G. Trialability

Trialability is defined as the chance in which particular technologies are allowed for potential adopters to experiment or use on a trial basis before adoption. Also, the trialable service will make it easier for people to adopt new technology [19]. Therefore, the study hypothesizes are:

H7a. Trialability has significant impact on mobile banking adoption for Thai Gen Y customers.

H7b. Trialability has significant impact on mobile banking adoption for Thai Gen Z customers.

H. Social Influence

Social Influence is defined as the degree to which an individual perceives can be influenced by social groups or peer pressure. A study found that one's intention to use mobile banking was significantly affected by people surrounding them [20] and are part of the social network [21]. Therefore, the study hypothesizes are:

H8a. Social Influence has significant impact on mobile banking adoption for Thai Gen Y customers.

H8b. Social Influence has significant impact on mobile banking adoption for Thai Gen Z customers.

The conceptual model is shown in Figure 1. There are eight (8) dependent variables which are perceived usefulness, perceived ease of use, perceived cost, perceived risk,

compatibility, self-efficacy, trialability, and social influence. The dependent variable is intention to adopt mobile banking application and services.

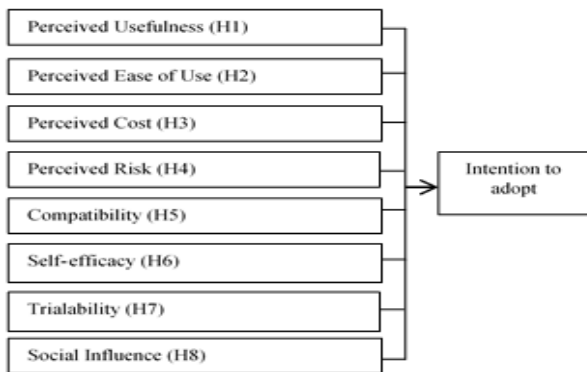


Figure 1: Conceptual Model

IV. RESEARCH METHODOLOGY

In this section, the research methodology is outlined and discussed. The details are as follows:

A. Samples and Data Collection

The total mobile banking users in Thailand are approximately 6.23 million [3]. According to the Yamane formula [22], the sample size was calculated based on total population of mobile banking Thai users in Gen Y and Gen Z which account for more than 100,000 samples. Using 95 percent confidence level with sampling error of 5 percent, sample size of respondents was 400. The pilot study of 30 respondents in Gen Y and Gen Z have been tested for reliability of the questionnaire. The quota sampling method was applied in this study with target of 200 Gen Y and 200 Gen Z respondents. The questionnaires were distributed through an online channel in January and February 2016. Total of 400 completed questionnaires, 200 from Gen Y and 200 from Gen Z, were returned.

B. Research Instrument and Variable Measurement

The questionnaire consists of 29 questions used to measure eight (8) independent variables and one (1) dependent variable. Besides demographic profiles, all items are measured on five-point Likert scales, ranging from 1 (strongly disagree) to 5 (strongly agree). Samples of the questions from the survey are shown in Appendix A.

C. Reliability

The reliability of the questionnaire was analyzed by using Cronbach’s alpha to measure the internal consistency of each variable before launching full samples. An alpha that is higher than 0.7 indicates an acceptable reliability as shown in Table 1.

Table 1
Reliability Analysis

Variable	Cronbach’s alpha
Perceived Usefulness	0.794
Perceived Ease of Use	0.869
Perceived Cost	0.744
Perceived Risk	0.754
Compatibility	0.850
Self-efficacy	0.704
Trialability	0.715
Social Influence	0.787

D. Validity

In determining the validity of the constructs, a factor analysis is examined. Hair et al. suggested the factor loading of 0.50 is used as a cut-off point [23]. After examination of the data, all eight factors contributing to consumers’ intention to use mobile banking services had a loading factor exceeding 0.5 and eigenvalues greater than 1.0 as shown in Table 2. These results confirm that the dataset is unidimensional and factorially distinct, and that all items used to operationalize the particular construct are loaded onto a single factor [24].

Table 2
Factor Analysis

Construct	No. of Items	Factor Loading	Eigen-values	Percentage of Variance
Perceived ease of use	5	0.737-0.844	3.416	11.78
Perceived usefulness	5	0.618-0.773	2.866	9.882
Perceived risk	5	0.656-0.786	2.604	8.979
Compatibility	3	0.779-0.841	2.289	7.893
Social influence	3	0.733-0.874	2.22	7.655
Perceived cost	3	0.701-0.836	2.077	7.162
Trialability	3	0.623-0.859	1.992	6.869
Self-efficacy	2	0.790-0.802	1.622	5.593

V. DATA ANALYSIS AND RESULTS

Statistical Package for Social Science (SPSS) is used to analyze primary data from questionnaires.

A. Descriptive Statistics

Table 3 shows descriptive statistics on demographic profile. About 60 percent of respondents are male. There are 200 respondents in Gen Y and 200 respondents in Gen Z. Table 4 shows means and standard deviation of each independent variable. The variable that has highest mean for Gen Y is perceived usefulness while compatibility has highest mean for Gen Z. Perceived cost has the lowest mean scores for both generations.

Table 3
Demographic Profile of Respondents

Demographic Profile	Number	Percentage
<i>Gender</i>		
Male	234	58.5
Female	166	41.5
<i>Generation</i>		
Gen Y	200	50
Gen Z	200	50

Table 4
Mean and Standard Deviation of Each Variable

Variables	Gen Y		Gen Z	
	Mean	Std. Deviation	Mean	Std. Deviation
PU	4.276	0.617	4.012	0.523
PE	3.927	0.815	3.891	0.582
PC	2.453	0.846	2.635	0.712
PR	2.944	0.624	2.726	0.625
CT	4.063	0.64	4.107	0.671
SE	4.028	0.675	3.928	0.799
TL	3.442	0.757	3.437	0.703
SI	2.943	0.796	3.593	0.898

Note: PU = perceived usefulness, PE = perceived ease of use, PC =perceived cost, PR = perceived risk, CT = compatibility, SE = self-efficacy, TL = trialability, and SI = social influence

B. Correlation Analysis

Prior to hypothesis testing, Pearson’s product moment

correlations were reviewed. The analysis shows the relationship among variables. Table 5 and Table 6 show a summary of the correlation among variables from respondents in Gen Y and Gen Z. All correlations among each independent variable are less than 0.7. Compatibility has strongest relationship with intension to adopt mobile banking application and services in both Gen Y ($r = 0.660$) and Gen Z ($r = 0.56$).

Table 5
Correlation among Variables for Gen Y

	PU	PE	PC	PR	CT	SE	TL	SI	IA
PU	1	0.57	-0.15	0.30	0.48	0.35	0.18	0.12	0.49
PE		1	-0.14	0.26	0.51	0.38	0.18	0.17	0.42
PC			1	0.03	-0.15	-0.08	0.12	0.14	-0.11
PR				1	0.20	0.16	0.12	0.29	0.28
CT					1	0.52	0.25	0.05	0.66
SE						1	0.11	0.08	0.47
TL							1	0.34	0.24
SI								1	0.14
IA									1

Note: IA = Intention to adopt

Table 6
Correlation among Variables for Gen Z

	PU	PE	PC	PR	CT	SE	TL	SI	IA
PU	1	0.12	-0.25	-0.06	0.26	0.25	0.08	0.20	0.33
PE		1	-0.07	0.19	0.41	0.36	0.23	0.23	0.38
PC			1	0.32	-0.06	-0.09	0.11	0.11	-0.07
PR				1	-0.02	-0.05	0.05	0.04	-0.02
CT					1	0.38	0.23	0.32	0.56
SE						1	0.25	0.33	0.50
TL							1	0.23	0.22
SI								1	0.43
IA									1

Note: IA = Intention to adopt

C. Collinearity Diagnostics Tests

The collinearity diagnostics test was performed to validate the variables and detect any multicollinearity issue by finding the tolerance value and the variance inflation factor (VIF) [25]. Variables that have a tolerance value of less than 0.20 or a VIF of greater than 5 possess a threat of having multicollinearity [26]. The collinearity statistics displayed in Table 7 and Table 8 prove that all variables have tolerance value above 0.2 and VIF value below 5. Therefore, all variables show no threat of multicollinearity.

Table 7
Collinearity Statistics of Gen Y

Variables	Collinearity Statistics	
	Tolerance	VIF
Perceived Usefulness	0.602	1.662
Perceived Ease of Use	0.579	1.726
Perceived Cost	0.922	1.085
Perceived Risk	0.835	1.197
Compatibility	0.558	1.792
Self-efficacy	0.707	1.414
Trialability	0.812	1.232
Social Influence	0.798	1.254

Table 8
Collinearity Statistics of Gen Z

Variables	Collinearity Statistics	
	Tolerance	VIF
Perceived Usefulness	0.836	1.196
Perceived Ease of Use	0.721	1.387
Perceived Cost	0.796	1.256
Perceived Risk	0.842	1.188
Compatibility	0.714	1.4
Self-efficacy	0.73	1.37
Trialability	0.877	1.14
Social Influence	0.799	1.251

D. Stepwise Multiple Regression Analysis and Hypothesis Test

Table 9 shows that compatibility ($\beta = 0.485$, $p = 0.000$), perceived usefulness ($\beta = 0.206$, $p = 0.001$), and self-efficacy ($\beta = 0.148$, $p = 0.014$), have positive significant impact on intention to use for Gen Y. These three variables are statistically significant at 95% confidence level. The three variables explain 48.3 percent of the variance in the intention to use mobile banking application and services (adjusted $R^2 = 0.483$).

Table 10 shows that self-efficacy ($\beta = 0.263$, $p = 0.000$), social influence ($\beta = 0.202$, $p = 0.001$), perceived usefulness ($\beta = 0.126$, $p = 0.025$), compatibility ($\beta = 0.362$, $p = 0.000$), have positive significant impact on intention to use for Gen Z. The variables are also significant at 95% confidence level. The four variables explain 45 percent of the variance in the intention to use mobile banking services (adjusted $R^2 = 0.45$).

The results from the stepwise multiple regressions show that hypothesis H1a, H5a, H6a, H1b, H5b, H6b and H8b are supported. The summary of the multiple regression models for both Gen Y and Gen Z respondents are presented in Figure 2 and Figure 3.

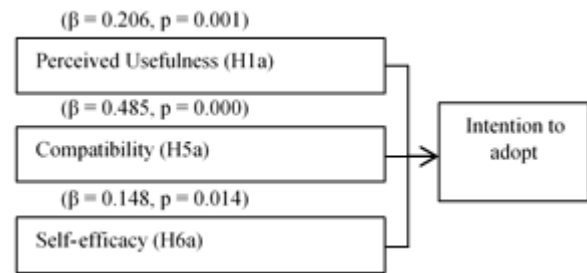


Figure 2: Multiple regression results for Gen Y

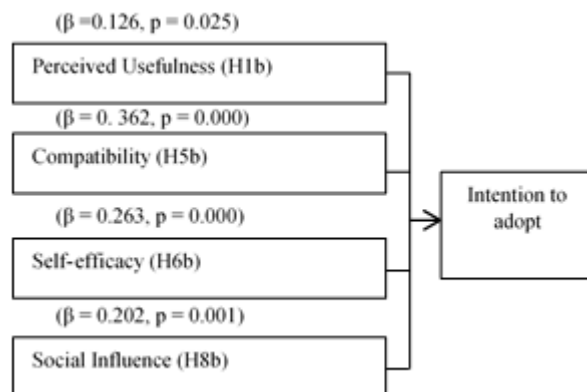


Figure 3: Multiple regression results for Gen Z

Table 9
Stepwise Multiple Regression for Gen Y

	Variable	B	β	t	Sig.	R	R ²	Adj. R ²	Overall F
Criterion	Intention to adopt					0.701	0.491	0.483	153.074
Predictor:	Compatibility	0.524	0.485	7.577	0.000				
	Perceived Usefulness	0.231	0.206	3.517	0.001				
	Self-efficacy	0.125	0.148	2.467	0.014				

Note: Significance at 0.05 level

Table 10
Stepwise Multiple Regression for Gen Z

	Variables	B	β	t	Sig.	R	R ²	Adj. R ²	Overall F
Criterion	Purchase Intention					0.679	0.461	0.450	41.723
Predictor:	Compatibility	0.380	0.362	6.128	0.000				
	Self-efficacy	0.232	0.263	4.446	0.000				
	Perceived Usefulness	0.170	0.126	2.265	0.025				
	Social Influence	0.158	0.202	3.521	0.001				

Note: Significance at 0.05 level

VI. CONCLUSION AND DISCUSSION

The summary of multiple regression analysis in Figure 2 reveals that compatibility, perceived usefulness and self-efficacy appear to have a significant impact on willingness of adoption of Gen Y. This means they use mobile banking services because it is compatible with their needs and lifestyles and they find the services useful. They also certainly have their abilities to use it.

On the other hand, the result of Gen Z summarized in Figure 2 shows that compatibility, self-efficacy, social influence, and perceived usefulness are the significant factors for them to adopt the services. Similar to Gen Y, compatibility is the most influencing predictor, but Gen Z chooses the services firstly because of their self-efficacy, followed by social influence and the services' usefulness.

The factors affecting both Gen Y and Gen Z are the compatibility, self-efficacy and perceived usefulness. Both Gen Y and Gen Z intend to adopt mobile banking services because it suits their life/working styles and banking needs.

They are confident in their ability and technological knowledge to be able to use the mobile banking services and also perceive usefulness and benefits of the services. However, the different significant factor among Gen Y and Gen Z is social influence which affects to Gen Z but not Gen Y. This can be interpreted that Gen Z's decision making is more influenced by social environment such as social media, advertising, trends and people around them as they are born with technology and grew up in the social media era. Family and friend also have high influence in their purchasing decisions or their tendency to try new things. Compare to Gen Y, Gen Z is more digitally and socially connected.

APPENDIX A

Perceived Usefulness

1. Mobile banking allows me to use the financial services from anywhere
2. Mobile banking allows me to use the financial services at any time.
3. Mobile banking can reduce my time from doing the same service through other channels.
4. Mobile banking is more convenient to do financial transaction than other channels.
5. Mobile banking enhances the effectiveness on the financial transaction.

Perceived Ease of Use

1. The application for mobile banking is user friendly.
2. The interface of mobile banking is intuitive and does not require further

explanation from the service provider.

3. It is easy to perform financial transactions through mobile banking.
4. It takes less time to complete financial transactions through mobile banking.
5. Mobile banking transactions are costly.

Perceived Risks

1. Mobile banking has not posed any threats.
2. Possibilities of errors in Mobile banking are lower than other channels.
3. Mobile banking is safe and secure.
4. The financial transactions through mobile banking are kept confidential.
 - Personal financial data cannot be hacked if the mobile device is lost.

Compatibility

1. Mobile banking fits well with my banking needs.
2. Mobile banking fits well with my lifestyle.
3. Mobile banking is compatible with my working styles.

Self-efficacy

1. I use mobile banking because I can learn how to use it by myself.
2. I use mobile banking because I am good at technology.

Trialability

1. Being able to try out the services will affect my decision in adopting mobile banking.
2. I use mobile banking services on a trial basis first to see if it serves my banking needs.
3. I know where I can get more information on mobile banking before using the services.

Social influence

1. I use mobile banking because I have seen advertisement from social media or mass media.
2. I use mobile banking because it is the current trend.
3. Friends and family have influence on my decision to use mobile banking

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